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Abstracts: Invited Speaker

Session: Plenary Session

MONDAY, JUNE 13, 2011, 13:30 – 15:00 H

INV1—ANATOMIC CORRECTION OF CONGENITALLY CORRECTED TRANSPOSITION OF THE GREAT ARTERIES

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Conventional surgery for congenitally corrected transposition of the great arteries (ccTGA) leaves the morphologic right ventricle in the systemic circulation. Long-term results with this approach yield a high incidence of tricuspid valve regurgitation and right ventricular failure.

Anatomic repair was introduced to restore the morphologic left ventricle to the systemic circulation and, therefore, improve the late outcome. Anatomic repair involves two steps: (1) correction of atrioventricular discordance by atrial switch (Mustard or Senning operation) and (2) correction of ventriculoarterial discordance by either arterial switch operation (ASO) in isolated ccTGA and ccTGA with VSD, or REV/Rastelli procedure in ccTGA with VSD and pulmonary stenosis, or Bex-Nikaïdoh operation when the VSD does not allow to connect the left ventricle with the aorta. Associated anomalies (such as anomalies of visceroatrial situs or cardiac position) may complicate the atrial switch; associated cavopulmonary anastomosis may be helpful. To allow anatomic repair, mitral valve and left ventricular functions must be normal; left ventricular retraining may be necessary in selected cases.

Anatomic repair is currently performed with an acceptably low early risk. Mid-term results are satisfactory in terms of functional status and preservation of ventricular function. Late results remain, however, to be determined (incidence of arrhythmias, need for reoperation, fate of left ventricular function).

Indications for surgery in ccTGA are currently as follows in our department. (1) Isolated ccTGA: "prophylactic" pulmonary artery banding in neonatal period and Senning/ASO when clinically indicated. (2) ccTGA with severe tricuspid regurgitation (with or without VSD): Senning/ASO in neonatal period. (3) ccTGA with VSD: early banding and Senning/ASO in infancy. (4) ccTGA with VSD and pulmonary stenosis: palliation if needed and Senning/REV or Senning/Nikaïdoh when clinically indicated. (5) Conventional surgery or Fontan procedure in selected patients.

INV2—JOINT ESC/EACTS GUIDELINES ON MYOCARDIAL REVASCULARIZATION

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Coronary artery disease can be managed by optimal medical therapy and/or mechanical revascularization, either by PCI or CABG. With evolving drugs, techniques, and evidence regarding these options, the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS) have published a guidelines document establishing indications for revascularization and the appropriate modalities of achieving it.

In the spirit of cooperation between cardiologists and cardiac surgeons, new concepts were coined. The creation of a 'heart team', comprising at least an interventional cardiologist, a non-interventional cardiologist, and a cardiac surgeon, is recommended for multidisciplinary decision-making. Indications for 'ad hoc PCI' where the therapeutic procedure is performed during the diagnostic angiogram are defined by an institutional protocol that accounts for the clinical conditions, the severity and urgency of the presentation and local experience.

Before revascularization is considered, significant stenoses and their repercussions in terms of ischaemia should be identified. Coronarography is recommended when the possibility of ischaemic heart disease is evaluated as highly probable (>90%). For intermediate situations (10%-90%), functional evaluation by stress echocardiography, nuclear imaging or Fractional Flow Reserve measurement is recommended, because adverse events are correlated to the presence of ischaemia, not to the presence of coronary stenoses.

Interventional management, percutaneous or surgical, depends on the clinical presentation—stable CAD, non-ST elevation acute coronary syndrome, and ST elevation myocardial infarction. Moreover, related clinical conditions—such as diabetes, heart failure, renal insufficiency, associated vascular disease, and previous revascularization—also have an impact.

The guidelines encompass the full extent of CAD treatment and expected outcomes, including managing stable and unstable angina, myocardial infarction, diabetes-related symptoms, and associated renal failure. Recommendations are made on all treatment options, from the technical aspects of stent implantation to the use of imaging technologies, and from risk management to follow-up activities.

Session: Adult Cardiac Surgery I

MONDAY, JUNE 13, 2011, 15:30 – 17:10 H

INV3—CORONARY MICROSURGERY: HOW FAR ARE WE FROM PERFECTION?

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More than 12,000 patients were treated between 1986 and 2011. 6732 patients were operated on because of multivessel CHD using microsurgery (microscope, microsutures, microinstruments).

6232 were CABG; 120 combined with carotid artery endarterectomy; 350 valve surgery; 13 ascending aortic aneurysm; 2 simultaneous aortorenal bilateral bypass; 15 with simultaneous renal, lung, tracheal, gastric, or rectal cancer surgeries. Perioperative care was individually chosen because of concomitant diseases, respiratory, gastrointestinal system, or diabetes mellitus.

Technique of CAB contained careful harvesting of conduits: LIMA, RIMA, RGEA, radial artery, and SVG.

After initiation of CPB, the microscopes were used for distal bypasses using 7 to 12x magnification, 8/0 Ethicon (3/8, 6.5 mm needles, 10 cm) suture and specially designed set of coronary microinstruments set. The era of beating heart surgery also minimized the rate of mortality and morbidity. The long-term patency rate was evaluated on 1100 patients, and the main indication for postoperative coronary angiography was electively controlled (3, 12, and 36 months and 5 and 7 years).

Table 1. The Average Patency Rate

Type of conduit	3 months	12 months	36 months	5 years	7 years
IMA (pedicled)	99%	98%	96%	95%	95%
SVG	86%	81%	78%	62%	56%
RA	93%	90%	85%	70%	65%
RGEA	96%	95%	-	-	83%

[The average patency rate]

As we can conclude from these data, microsurgical technique effectively increases patency of CABG; the best conduit for coronary revascularisation is IMAs and RGEA.

There is no doubt that microvascular technique based on operating microscope, microinstruments, and microsutures yields excellent follow-up results only together with adequate treatment of concomitant diseases and postoperative rehabilitation of our patients.

Session: Adult Cardiac Surgery II

MONDAY, JUNE 13, 2011, 17:40 – 18:40 H

INV4—CURRENT STATUS OF CORONARY ARTERY BYPASS SURGERY

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Coronary artery bypass surgery (CABS) has been one of the most important and studied surgical procedures in the history of Medicine.

Routine CABS with saphenous vein graft (SVG) started in the sixties. In the eighties a long-term retrospective follow-up study revealed the superiority of the left internal thoracic artery (LITA) to the anterior descending artery (LAD) versus SVG-to-LAD. Today LIMA-to-LAD is standard practice. The use of bilateral internal thoracic arteries (BITA) improved long-term survival compared to LITA + SVG. However, BITA is not widely used due to technical issues, adverse anatomy in certain situations, concerns regarding increased morbidity, and emphasis on short-term considerations. The benefit of the radial artery (RA) as alternative conduit to the SVG remains controversial with several case series suggesting that the RA is superior to SVG. The use of multiple arterial bypass grafts eliminating the SVG in CABS has been advocated to increase long-term results in selected patients.

Routine off-pump CABS started in the nineties and since then, few topics in cardiac surgery have given rise to more debate and controversy. Nevertheless, there is some evidence that off-pump CABS is associated with operative risk decrease in some high-risk groups. The CORONARY Trial should unravel this controversy. Minimally invasive CABS, totally endoscopic CABS, and hybrid strategies have not been widely adopted.

The SYNTAX Trial revealed that major adverse cardiovascular or cerebrovascular event rates in patients with severe three-vessel and/or left-main (LM) coronary artery disease (CAD) were significantly higher for percutaneous coronary intervention (PCI) than for CABS at three-year follow-up. Thus, CABS remains the standard of care in complex CAD.

The EXCEL Trial will address PCI versus CABS in patients with LM CAD.

Finally, CAD is a progressive disease; therefore, secondary prevention is mandatory after any procedure in the long-term follow-up.

Session: Congenital Heart Diseases II

MONDAY, JUNE 13, 2011, 17:40 – 18:50 H

INV5—MODIFIED REPAIR IN PATIENTS WITH EBSTEIN'S ANOMALY

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Background: Ebstein's anomaly is a rare congenital heart defect of the tricuspid valve in which the hinges of the septal and/or posterior leaflets are displaced downward to the right ventricle. The anterior leaflet is usually not displaced but is enlarged and sail-like and valve closure is likewise displaced downwards. Since 1988 we have operated patients using a modified repair technique of the tricuspid valve. This technique restructures the valve mechanism at the level of the true tricuspid annulus by using the most mobile leaflet for valve closure without plication of the atrialized chamber. Additional attachment of the anterior right ventricular wall to the interventricular septum (Sebening's stitch) and reconstruction of the tricuspid valve as a double orifice valve were performed in a modification since 2004. We present our long-term results.

Patients and Methods: Tricuspid valve repair was performed in 58 patients with Ebstein's anomaly (38 female; age 0.6–64 years, median 28 years). Median follow-up was 68 (5–238) months. Survival rate, re-operations, NYHA classification, maximal VO2, right ventricular function (pulmonary flow velocity integral, VTI PA), and tricuspid valve insufficiency were documented.

Results: No patient died during the operation; early mortality was 7% and late mortality 3.5%. All patients who died were nearly 50 years or older, and were in NYHA class III or IV. Five re-operations were necessary (8.7%). NYHA class and tricuspid valve insufficiency improved significantly ($P < .001$); so did maximal VO2. VTI PA increased significantly with stable heart rate ($P = .01$). No aneurysm of the right ventricle was observed.

Conclusions: Long-term follow-up demonstrates good clinical results in tricuspid repair without plication of the right ventricle, even in cases where tricuspid valve replacement is discussed. Modifications seem to support these results. The operation in older patients with progressive NYHA class seems to carry a higher operative mortality.

Session: Adult Cardiac Surgery III

TUESDAY, JUNE 14, 2011, 09:20 – 10:50 H

INV6—SURGERY IN HEART FAILURE: EDGE-TO-EDGE DOUBLE ORIFICE VALVULOPLASTY. WHEN DOES IT FIT?

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Advanced left ventricular (LV) remodeling in ischemic or idiopathic dilated cardiomyopathy leads to displacement of the papillary muscles, tethering of the mitral leaflets, annular dilatation, and functional mitral regurgitation (FMR). In appropriately selected patients, an undersized annuloplasty is the treatment of choice for patients with FMR. However, the ideal candidate for annuloplasty alone is a patient in the early phase of the disease before the occurrence of advanced LV remodeling. On the other hand, when the tethering of the leaflets is severe, additional procedures should be added to annuloplasty to enhance the effectiveness and the durability of the repair. In our Institution we decided to add the edge-to-edge (EE) technique to the undersized annuloplasty whenever substantial apical tenting was present (coaptation depth > 1cm) with the aim to prevent the recurrence of MR. The rationale for using the EE technique in FMR is that, with this approach, the site of the regurgitant jet is specifically addressed, early valve closure is ensured and the progression of the left ventricular remodeling is counteracted. The key point of this technique is to identify the location of the regurgitant jet. Exactly at that point, the free edge of one leaflet is sutured to the corresponding edge of the opposing leaflet thereby eliminating the incompetence of the mitral valve. When the regurgitant jet is in the central part of the valve, the EE produces a mitral valve with a double orifice configuration. When the regurgitant jet is located in the proximity of a commissure, the EE leads to a single orifice mitral valve with a relatively smaller area. In our experience the addition of the EE suture to annuloplasty in patients with a coaptation depth >1 cm has been beneficial leading to a recurrence rate of significant MR 6-fold lower compared to that registered in patients submitted to undersized annuloplasty alone.

Session: PASCaTS I

TUESDAY, JUNE 14, 2011, 09:20 – 10:55 H

INV7—RHEUMATIC HEART DISEASE: REPAIR VERSUS REPLACEMENT IN SOUTH AFRICA

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Introduction: Rheumatic Heart Disease (RHD) remains the most common indication for valvular surgery in Central South Africa. Valve procedures were performed in 381 patients during the period 2008–2010. RHD was present in 259 patients (67.8%). There appears to be a reduction in the percentage of valves repaired versus replaced in this patient cohort compared to previously published case series from South Africa where 43.8% of mitral valves were repaired.

Objectives: Data from 381 patients operated in Bloemfontein (2008–2010) were compared with data from several case series published in South Africa between 1984 and 1990 (Antunes et al, 1984, 1989, 1990). 1) To determine the percentage of repairs versus replacements in the current era. 2) To compare these results with earlier published series from South Africa. 3) To explore a possible epidemiological shift in the presentation of RHD. 4) To analyse current surgical practise.

Results: Although no change of practise was introduced at our institution (and with a historical repair rate equal to that published from South Africa), the mitral valve repair rate has dropped to 31.2%. The incidence of acute rheumatic valvular disease as indication for surgery completely disappeared now, compared to 29% in young patients presenting with predominantly regurgitant lesions in the 1980s. Infective endocarditis was present in up to 12% of young patients in the 1980s compared to 4.7% now. Re-operation rate ranged from 12%–22% (1980s) to 12% in the present series. Mean age at mitral valve repair was 21 years (1980s) while our present valvular surgery population presents at a mean age of 46 years.

Discussion: The present South African surgical experience probably represents an epidemiological shift with a reduction of younger patients presenting with RHD amenable for repair to patients presenting with advanced valvular pathology, making successful valvular repair unlikely.

INV8—MECHANICAL VERSUS TISSUE VALVE REPLACEMENT IN THE TROPICS

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In the tropics as in many parts of the world, a significant number of patients of various age groups still present with valvular

heart disease requiring intervention. It is true that many valvular problems can be dealt by the invasive cardiologists; nevertheless surgery remains the mainstay of therapy. Many surgical options are available the most appropriate choice depends on multiple factors. There is no doubt that valve repair is superior if can be accomplished successfully. The tricuspid valve is the most universally repaired valve; the mitral valve is often repaired whereas the aortic valve is repaired only occasionally. When it comes to replacement, the dilemma really starts. There are two major groups of valve substitutes, biological and mechanical. In the balance are the problem of durability with biological valves and the problem of anticoagulation with mechanical valves. There are published general guidelines to help in decision making. However, these are based on studies and observations mainly from western hemisphere where facilities are good, education is widespread and culture is fairly homogenous. These guidelines are difficult to follow in parts of the world where the facilities are suboptimal, education is lacking, and the culture is diversified.

In the tropics, anticoagulation control can be very problematic. Warfarin itself may not be available, and some patients cannot even afford it. Other major drawbacks relate to exercise limitation in the young and to females who wish to become pregnant. Keeping that in mind and knowing that mechanical valves are not truly lifelong replacement, we opt in these situations to use biological valves. Use of bioprosthesis in the young is controversial, but our data support their use in the young accepting the fact that a reoperation is inevitable. Reoperations are now safe and in many hands operative mortality of the first redo operation is the same as the initial one.

Session: Adult Cardiac Surgery IV

TUESDAY, JUNE 14, 2011, 11:20 – 12:50 H

INV9—PRESENT CONCEPTS OF VALVE SURGERY FOR RHEUMATIC DISEASE

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Acute rheumatic fever and consequent RHD remain very common in low and middle income countries, with social, economic, and medical consequences. WHO estimates 12 million people are currently affected by rheumatic heart disease. Two thirds are children 5 to 15 years of age. Penicillin secondary prophylaxis and surgery favourably modify natural history of the disease. Key strategies to decrease the burden of RHD range from preventive public health interventions to tertiary surgical care in specialized hospital settings basically to treat rheumatic valve disease.

The mitral valve is the most often involved (90%), and aortic valve involvement is less frequent (35%). The patient population is mostly young and includes females in child-bearing age who are generally difficult to anticoagulate properly. Aggressive approach toward valve repairs is therefore justified. Rheumatic mitral valve repair techniques are standardized, and results are generally predictable. However, results of rheumatic aortic valve repair have been less favorable. Nevertheless, results are dependent on the surgeon's experience as well as valve pathology. Predictors of valve repair failure include intervening during acute phase of RF and recurrence of rheumatic activity and severity of valve pathology. For patients with rheumatic aortic valve disease, the Ross procedure remains an option for select patients. The caveat has been susceptibility of the autograft to rheumatic valvulitis. Though valve replacement remains a viable option, one should always attempt the repair despite knowing that a redo surgery maybe inevitable.

Session: PASCaTS II

TUESDAY, JUNE 14, 2011, 11:20 – 12:50 H

INV10—ESTABLISHMENT OF A SUSTAINABLE CARDIOTHORACIC SURGICAL PROGRAM FOR THE INDIGENT IN LIMA, PERU: KEYS TO SUCCESS.

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Sustainability can be difficult to achieve in programs aimed at the indigent. We will discuss the establishment of a cardiothoracic surgical (CTS) program for the indigent in Peru, which began over a decade ago and continues to thrive today. We will list key elements to the success of such an endeavor.

In 1998 Dr. Efrain Montesinos retired from a successful career as a cardiac surgeon in Toledo, Ohio, to return with his wife Maria to his native Peru. Their goal was to establish a program at Hospital Dos de Mayo, the 136-year-old, 800-bed hospital for the indigent in Lima. They partnered with the CTS team from Nationwide Children's Hospital in Columbus, OH, to launch the program in 1999. Using donated equipment and supplies brought by teams from the USA, they were able to build volume and success. Resident training was built into the program. Maria provided full time logistical support, keeping track of patients as well as the inventory of equipment and supplies. Outcomes were excellent and will be discussed.

Despite the untimely death of Dr. Montesinos in late 2007, the program has seen a 40% increase in volume under the surgical leadership of Dr. Julio Peralta, who was trained by Dr. Montesinos. Complexity has increased, making the program a national leader, including moving into the field of neonatal open heart surgery. Much of the original donated equipment has been replaced with the support of the Peruvian American Medical Society. A newly

opened Center for Intensive Care and Diagnosis has added to the critical infrastructure necessary for this type of work.

Keys to success include: 1) Gifted local leadership; 2) Logistical support; 3) Sufficient resources; 4) Ongoing partnership with an established program; 5) Plan for long-term fiscal stability; and 6) Succession Planning

Session: Heart Lung Failure I

TUESDAY, JUNE 14, 2011, 11:30 – 13:10 H

INV11—LEFT VENTRICULAR RECONSTRUCTION – STATE OF THE ART

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In 20% of patients, progressive left ventricular (LV) dilatation occurs after acute myocardial infarction (AMI).

This dilatation—expressed as end-systolic volume index (ESVI) and/or end-diastolic volume index (EDVI)—is a significant risk factor for death after AMI.

Post-AMI dilatation results from the LV remodeling process—most often after an acute occlusion of the left anterior descending coronary artery (LAD) affecting the anterior wall including parts of the septum, but may also affect the posterior or lateral wall of the LV.

Asynergetic areas of the LV and thus increases in LVEDVI can be caused by both dyskinesis and akinesis.

Preoperatively it is therefore important to distinguish between viable and non-viable cardiac muscle in the asynergetic area and to assess the viability of the remote muscle. Currently this is best done by magnetic resonance imaging (MRI) measuring late gadolinium enhancement (LGE), the amount of asynergic scar, viability of remote muscle, etc.

The surgical technique for LV reconstruction is straightforward. The procedure can be carried out on the beating heart or during a period of arrest using blood cardioplegia. The latter has to be used when intracardiac thrombi are present to avoid embolisation. A new LV apex is being created by using one or two purse-string sutures in the border zone between viable and non-viable muscle (Fontan stitch) and the LV is closed either directly with remnants of scarred tissue or with a patch. Special surgical techniques for anterior and posterior LV reconstructions, reconstructions for pseudo-aneurysms and combined procedures (coronary artery bypass grafting, mitral and tricuspid valve reconstructions, endocardial resections) are being presented.

Many studies have been published investigating the results of LV reconstruction as compared to medical treatment or conventional cardiac surgery for decades by many scientific groups. These results as well as the methodological shortcomings of certain trials will be discussed.

Session: Congenital Heart Diseases III

TUESDAY, JUNE 14, 2011, 16:30 – 18:00 H

INV12—LONG-TERM IMPLICATIONS AFTER DIRECT RE-IMPLANTATION OF THE LEFT CORONARY ARTERY INTO THE AORTA IN PATIENTS WITH ALCAPA

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Background: Establishing a dual coronary system is the main goal in patients with ALCAPA. We evaluated the long-term outcome after ALCAPA repair in children.

Methods: Twenty-seven children (group 1: infants, n = 15, age 0.4 ± 0.3 years; group 2: >1year, n = 12, age 5.8 ± 3.3 years) underwent direct reimplantation of the LCA into the aorta. Groups were compared regarding left ventricular (LV) function before operation, at discharge and at follow-up. Additional patients underwent spiroergometry, MRI, and an interview regarding life-style at follow-up.

Results: All patients are alive, are free from heart failure symptoms, and are leading a normal life style (follow-up 13.1, 0.1–18.2 years). Freedom from reoperation was 96%. Preoperative LV function was significantly worse in group 1 than group 2 (LVEF 37 versus 56%, $P = .005$; LVFS 18 versus 28%, $P < .001$; Z-score LVEDD 7.1 versus 3.3, $P = .002$). At follow-up LVEF, LVFS and Z-score of LVEDD had significantly improved compared with preoperatively (60 versus 44%, $P = .013$; 22 versus 32%, $P < .001$ and 5.6 versus 1.0, $P = .001$) and were in normal range in both groups. Sixteen patients underwent spiroergometry and had normal VO2 max (>20). However, in MRI 13 patients had wall motion abnormalities and scar formation, and 7 showed perfusion deficits, although subjective physical capacity was good in 87%.

Conclusion: Although LV function completely recovers and physical and intellectual capacity are in the normal range after ALCAPA repair, myocardial damage occurs in some patients and may lead to cardiac problems later in life. Life-long follow-up, including echocardiography and MRI checks, is strongly recommended.

Session: Plenary Session

WEDNESDAY, JUNE 15, 2011, 08:00 – 09:00 H

INV13—CARDIOMYOCYTES DERIVED FROM PLURIPOTENT STEM CELLS

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There is no doubt that work on stem cells will be the most promising approach for the medicine of the 21st century and probably revolutionize the therapy of many diseases including cardiac infarction and failure, diabetes, Parkinson's disease, spinal cord lesion, etc.

It is our aim to provide a fundamental basis to the development of new medical treatments. Stem cell research is a broad field that requires nearly all techniques of modern life science such as genetics, cell biology, physiology, biochemistry, histology, etc.—but it also requires the input of experimental surgery and bioengineering technologies.

Induced pluripotent stem (iPS) cells represent the most promising approach for future stem cell–based tissue repair in regenerative medicine. iPS cells are functionally highly similar to embryonic stem (ES) cells, but in addition have the advantage of being ethically uncontroversial and obtainable from readily accessible autologous sources. However, although proof of principle for the therapeutic use of iPS cells in neuronal and cardiac diseases has been shown both at the laboratory scale and in animal models, the methods used today for generation, cultivation, differentiation, and selection still have to be translated for their later clinical usage.

This presentation will give an overview on our recent research work on embryonic in comparison with iPS cells. Starting from our basic investigations on the physiological properties of cardiomyocytes developed from pluripotent stem cells we have established in vitro and in vivo transplantation models enabling us to systematically investigate and optimize the physiological integration and regeneration of the diseased tissue. Our main focus is the cardiac infarction model. Moreover, in vitro culture and expansion of stem cells is far from optimal and needs further research in order to overcome problems related to insufficient numbers of obtained stem cells and aging of the obtained stem cell population.

INV14—HYBRID AORTIC ARCH RECONSTRUCTION

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Patients with extensive atherosclerotic aneurysm of the arch and the descending aorta present a serious challenge. The two staged elephant trunk technique was advocated by Prof. Borst in 1983 and it since has been extensively used. Elephant trunk technique facilitates surgery on the aneurysm of downstream descending aorta following total arch replacement. But, a significant number of patients do not return for the second stage for a variety of reasons. Those patients often have multiple comorbidities including other cardiovascular, stroke, renal, and pulmonary disease.

The so-called frozen elephant trunk technique with total arch replacement, which was advocated by several Japanese surgeons in the 1990s, offers the advantage of performing both stages of a multi-segment repair simultaneously. The stented elephant trunk graft, or "frozen elephant trunk," was made by surgeons during operation in Japan and now is commercially available in Europe specifically designed for this operation. It is feasible approach, however, the incidence of the spinal cord injury was fairly high in patients with a long frozen elephant trunk.

After the introduction of endovascular stent grafts to treat thoracic aortic disease (TEVAR), many patients have now undergone the completion of their elephant trunk procedure using TEVAR, so-called hybrid aortic arch reconstruction.

Furthermore, hybrid arch repairs involve some form of "debranching" of the brachiocephalic vessels followed by TEVAR exclusion of some or all of the aortic arch without cardiopulmonary bypass, circulatory arrest, and cardiac ischemia. Although the early results of hybrid reconstruction of the aortic arch have been encouraging, there are several limitations to consider.

The profiles of patients and technical aspects of the surgical and hybrid procedure including potential complications will be discussed.

[hybrid arch reconstruction]

Session: Perfusion

WEDNESDAY, JUNE 15, 2011, 09:10 – 10:40 H

INV15—EVALUATION OF HEMODYNAMIC AND REGIONAL TISSUE PERFUSION EFFECTS OF MINIMIZED EXTRACORPOREAL CIRCULATION (MECC)

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Background: Retrospective data analysis done by our workgroup found results in terms of higher MAPs and less norepinephrine consumption. This current study addressed this observation in more detail with particular attention on major organ systems.

M&M: This was a prospective, randomized trial with 40 patients (MECC and CCPB) undergoing coronary bypass grafting (MECC™ Maquet versus conventional Bypass). Primary endpoints were the perioperative course of MAP, SVR, and the consumption of norepinephrine.

Results: At 4 of 5 time points during ECC, the MAP values were significantly higher in the MECC group (after starting the ECC 60 mmHG ± 11 versus 48 mmHg ± 10, $P = .002$). MECC patients received significantly less norepinephrine (MECC 0.56 µg ± 1.6 versus CCPB 5.2 µg ± 9, $P = .038$). S100 and neuronal specific enolase release was significantly better in MECC patients, (S100: 0.56 µg/L ± 0.31 versus 1.27 ± 0.85, $P = .02$, NSE: 9 µg/L ± 4.6 versus 19 ± 9, $P < .001$). Significant higher values in the CCPB group were observed for CK-MB and troponin T (CK-MB 0.38 µmol/L ± 0.1 versus 0.66 ± .21, $P < .001$; Troponin T MECC 0.08 µmol/L ± 0.05 versus. CCPB 0.22 µmol/L ± 0.15 $P < .001$). Regional saturation: The rSO2 measured at right and left forehead and the renal area was similar for both groups during ECC and significant higher at CCPB Group 1 and 4 hours after termination of ECC.

Conclusion: The results of our study support the theory that MECC procedures provide a higher mean arterial pressure during ECC. In our opinion the use of MECC is less harmful to the major organ systems and very easy to perform.

INV16—DIFFERENCES IN MICROCIRCULATORY VASOMOTOR FUNCTION BETWEEN NON PULSATILE CONVENTIONAL AND MINIMIZED CARDIOPULMONARY BYPASS

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Objective: During nonpulsatile cardiopulmonary bypass (NP-CPB) higher vascular resistance is caused by increased sympathetic nerve activity which leads to altered regional blood flow to vital organs and contributes to the known pathophysiology of CPB. As a compensatory mechanism rhythmical vasomotion of the microvasculature may enhance microcirculatory blood flow and restore organ perfusion. Unfortunately this has only been investigated for conventional CPB. Whether minimized CPB causes similar vasomotor pattern remains unclear. Spectrophotometric measurement of the intestinal microcirculation may reveal the impact of different CPB systems to vasomotor function.

Methods: During a prospective study to investigate blood consumption and inflammatory response of the Terumo ROC-Safe® perfusion system 26 patients (minimized system n = 15, conventional system n = 11) were allocated to further measurement of the intestinal microcirculation. The perfusion of the mucosa was measured by spectrophotometry before, during and after CPB to show microcirculatory flow and filling conditions. Vasomotor function was characterized by Fast Fourier Transformation to show frequency and spectral density of the oscillatory pattern.

Results: The oscillatory patterns of minimized systems showed a markedly different behavior compared to conventional CPB. With minimized systems we observed lower spectral frequency patterns as well as corresponding lower spectral power. The vasomotor oscillation of conventional systems showed higher spectral frequencies with higher intensities.

Conclusion: Differences in the construction of cardiopulmonary bypass may not only affect the filling conditions of the intestinal microcirculation but also cause different vasomotor function. The possible clinical implications of these compensatory mechanisms require further investigation.

INV17—A MODERN CONCEPT FOR AORTIC VALVE SURGERY IN PATIENTS WITH SEVERE LIVER FAILURE

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Background: Cardiac surgery in patients with severe liver failure (Child B/C) is associated with multiorgan failure, bleeding, infection and high mortality (80%–100%). The outcome might be improved by thorough preoperative preconditioning and the use of minimized perfusion circuits (MPC) during surgery.

Patients and Methods: Five patients with liver cirrhosis (n = 3: Child B, n = 2: Child C, male, mean age 60 ± 6 years) underwent aortic valve replacement (AVR). One patient underwent AVR, tricuspid valve reconstruction and CABG. All patients had renal failure, ascites and esophageal varicosis, a contraindication for transesophageal echocardiography, which is necessary for interventional AVR.

Surgery was performed using a MPC concept (ROCSafe®) and Calafiore cardioplegia to achieve less hemodilution and inflammation as well as normothermic conditions. Preoperatively selective gut decontamination was performed to avoid spontaneous peritonitis. Supportive liver/renal protection was done with selenium 100 µg/day, thiamine 100 mg/day, and acetylcysteine 2 g/day.

Results: Surgery with MPC was uncomplicated. All patients survived the first 30 days, and one patient died after 43 days due

to pneumonia and multiorgan failure (combined procedure). The survivors were discharged 27 ± 19 days postoperatively. The transfusion requirements of these patients were moderate (PRBC 5 ± 3 units, FFP 8 ± 7 units, thrombocytes 3±1 units). Mean stay on ICU was 4 ± 3 days. Length of mechanical ventilation was 23.5 ± 41.6 hours. Close monitoring (intermediate care unit) with recurrent drainage of ascites and pleural effusion was required for additional 5.6 ± 4.9 days. The patients are still alive 4, 6, 25, and 27 months after surgery. Renal and liver function improved after surgery as calculated by the MELD score (creatinine/bilirubin/INR: 14 ± 1 preop. versus 12 ± 3 at POD 10).

Conclusion: Minimized extracorporeal perfusion, consequent preoperative gut decontamination and adjusted organoprotective drug therapy led to reduced perioperative complications in AVR-patients with severe liver failure. Compared to previously reported data, the outcome of these high-risk patients was excellent.

INV18—PRIMING SOLUTIONS AND CLINICAL EFFECTS ON PAEDIATRIC CPB PATIENTS

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The priming solution in pediatric and neonatal CPB is the answer at two questions about the adequate level of hematocrit and the acceptable level of hemodilution to provide the necessary oxygen delivery without inducing interstitial edema. The literature is weak on the topic and does not allow strong recommendations.

The main determinants of the hematocrit level will be the hematocrit of the child, the priming volume, the complexity of the repair and the time on bypass.

Han showed that a significant desaturation occurred at the onset of bypass and during rewarming with a clear prime. The Boston team demonstrated that there was a link between lower hematocrit levels and increased fluid balance, worth psychomotor outcome with a trend toward higher lactates

The components for an optimal priming solution for CPB?

Most of the studies comparing crystalloid versus something else show more important weight gain, and an increased risk of renal failure in the crystalloid group. With hydroxylethyl starch the maximum load is very rapidly reached. The choice will be between 5% human albumin and fresh frozen plasma. WC Oliver showed that patients receiving fresh frozen plasma bled less if they were cyanotic or if they had a complex repair.

When using blood: SS Mou showed that fresh whole blood did not bring any advantages. The practise of pre bypass ultrafiltration is increasing to clean the priming solution.

- Addition of glucose in the priming solution is unnecessary
- Addition of steroids remains very controversial
- Addition of bicarbonates directly or by Bicarbonate Buffered Ultra Filtration seems useful.

Within the last two decades, the priming volume of the pediatric oxygenators has been reduced by 75% and allows to go safely on bypass with less than 150 mL. It is possible to decrease the level of hemodilution and the use of blood components, to improve the postoperative haemostasis.

INV19—OVERVIEW OF PEDIATRIC PERFUSION

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At least 8 out of every 1000 babies born each year have a heart defect. About half of these babies have a minor defect and will not need any treatment, but the rest need medical treatment or surgery. The majority of congenital heart defects are detected at birth. Symptoms of congenital heart defects can include: fast or difficult breathing; fatigue (tiredness); cyanosis (a bluish tint to the skin, lips, and fingernails); poor feeding; and poor blood circulation.

Great Ormond Street Hospital for Children NHS Trust ranks amongst the most prestigious paediatric medical institutions in the world. This presentation is an overview of the standard treatment protocol at Great Ormond Street concerning all ranges of perfusion and patient management from neonate to large children. Clinical parameters typically measured including pressure drop, gas transfer, temperatures, flow rate, and patient demographics will be presented and discussed, as will the different protocols for fluid management as well as the use of the Gampt Bubble Detection system in routine cases. Case examples of gaseous microembolic load are presented and discussed, as will the positioning of the heart lung machine, set up, prime, and use in ECC per the standard institutional protocol for ECC. Time will be allocated to discuss the challenges unique to pediatric perfusion as compared to routine adult perfusion, as well as the shifting demographics of the case load at the specific institution.

Session: Adult Cardiac Surgery VII

WEDNESDAY, JUNE 15, 2011, 11:10 – 12:40 H

INV20—HYPERTROPHIC OBSTRUCTIVE CARDIOMYOPATHY: COMPARISON OF OUTCOMES AFTER MYECTOMY OR ALCOHOL ABLATION

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Background: In November 2002, our center began offering alcohol ablation as an alternative to surgical myectomy for patients with hypertrophic obstructive cardiomyopathy (HOCM). Patients with concomitant lesions were referred for surgery. We reviewed the early outcomes for both protocols.

Methods: Seventy-nine patients had intervention for HOCM to March 2011. Twenty-five patients elected to have alcohol ablation. A total of 44 patients had an isolated myectomy and were compared with those who had an ablation. Hospital records were

reviewed, and follow-up contact (2.2 ± 0.8 years) with the patient and recent echocardiographic reports were obtained. Differences in clinical and hemodynamic outcomes between achieved treatment groups were compared after adjustment for differing baseline patient characteristics.

Results: The patients undergoing alcohol ablation (n = 25) were older (60 ± 14 versus 52 ± 13 years), and had bigger pressure gradients (103 ± 45 versus 87 ± 28 mmHg), lower degree of mitral regurgitation (1.4 ± 0.2 versus 2 ± 0.8), and similar symptomatic status compared with those in the myectomy group. Among the completed alcohol ablations, there was 1 early death, and 5 other patients were referred for myectomy. There were no late deaths at latest follow-up, and 97% of the patients are in New York Heart Association (NYHA) class II or I. Adjusted comparisons showed significantly lower postintervention left ventricular outflow gradients at rest in the myectomy group (17 ± 6 versus 46 ± 32 mmHg), mitral systolic anterior motion (20% versus 57%), and NYHA class. No significant difference was present in postintervention septal thickness or freedom from postintervention pacing, although in time-related analysis, the 2-year freedom from pacing is 95.8% versus 70%, favoring myectomy.

Conclusions: Either alcohol ablation or myectomy offers substantial clinical improvement for patients with HOCM. Hemodynamic resolution of the obstruction and its sequelae is more complete with myectomy. Residual lesions after alcohol ablation might affect longer-term outcomes.

Session: Plenary Session

WEDNESDAY, JUNE 15, 2011, 13:30 – 14:30 H

INV21—MITRAL VALVE REPAIR IN COMPLEX ISCHEMIC MITRAL REGURGITATION

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Objective: Ischemic (I) mitral regurgitation (MR) can be defined as moderate to severe MR precipitated by acute myocardial infarction with essentially normal chordal and leaflet structure. Valve repair has been shown to provide major survival benefits in IMR, and is the current procedure of choice. Some cases of IMR, however, can pose difficult anatomy, and this video will illustrate techniques that are useful for repairing complex IMR.

Methods: Most patients with IMR have predominant posterior commissural annular dilatation, and require only ring annuloplasty. Because reducing anterior-posterior valve dimension is important in this entity, full rigid rings should be employed, and have low late failure and MR recurrence rates. With posterior leaflet tethering, autologous pericardial patches are effective in restoring leaflet coaptation. If papillary muscle elongation or rupture occurs, Gore-Tex artificial chordal replacement to a viable papillary muscle performs well. With IMR accompanying posterior ventricular aneurysms, standard trans-atrial mitral repair provides the best results, with associated aneurysms repaired concurrently.

Results: The principles of mitral repair in IMR are reviewed, including the background of procedures employed. By showing operative videos and echocardiograms from 6 patients, each method is illustrated, including late outcomes. Using these techniques, virtually all IMR can be repaired successfully, with consequential patient prognostic benefits even with the most complex anatomy.

Conclusions: Ischemic mitral regurgitation has been shown to have better outcomes when managed with valve repair. Using combinations of full ring annuloplasty, pericardial leaflet augmentation, and artificial chordal replacement, even the most complex IMR valves can undergo autologous reconstruction with excellent long-term results.

Abstract Sessions: Oral Presentations

Session: Adult Cardiac Surgery I

MONDAY, JUNE 13, 2011, 15:30 – 17:10 H

OP1—MINIMALLY INVASIVE DIRECT CORONARY ARTERY BYPASS FOR SINGLE VESSEL DISEASE IN INDIAN SCENARIO

Gupta, M., Prasad, J., Shrivastav, A., Haseen, M.A., Singh, B.
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Background: Minimally invasive direct coronary artery bypass (MIDCAB) grafting is a cheaper alternative to endoscopic and robotic CABG for patients with a high-grade left anterior descending coronary artery (LAD) stenosis. We report our experience of MIDCAB without CPB for patients with single vessel LAD disease at our institution.

Methods: From January 2001 to January 2011, 200 patients, including 150 males and 50 females, with proximal LAD disease who underwent MIDCAB surgery were included in the study. The inclusion criteria were proximal LAD stenosis unsuitable for balloon angioplasty, failed angioplasty, those with in-situ stent stenosis and those who could not afford angioplasty. However, obese female patients, angiographic evidence of an intramyocardial running LAD, diffusely diseased and small LAD, unstable angina, and those requiring emergency revascularization after failed PTCA were excluded from the study. In 2 patients with COPD, MIDCAB was done under epidural anesthesia.

Results: Early and late mortality was 0.5% and 1.0% respectively. The infarct rate was 1.0%. Other complications (eg, reoperation for management of bleeding, chest wound problems, arrhythmias, cerebrovascular accident, pericardial effusion, pulmonary complications) were reported in 10 cases. The conversion rate to sternotomy/cardiopulmonary bypass was 2.0%. Incidence of re-intervention for graft failure was 1.0%. Duration of mechanical ventilation and total hospital stay were 7 ± 3.0 hours (0-5 hours) and 5 ± 1.0 days (3-6 days) respectively. Atrial fibrillation was seen in 5 patients. At 6-month follow-up, 160 grafts were studied angiographically. 3/160 graft (2.0%) was occluded and 1/160 graft (7.2%) had a significant stenosis.

Conclusion: Although MIDCAB grafting is a challenging technique, it may be safely performed on selected patients with low postoperative mortality and morbidity and adverse outcome of sternotomy can be avoided. Clinical outcomes and immediate graft patency after MIDCAB are acceptable. It is a cheaper alternative to endoscopic and robotic CABG which provides excellent cosmesis.

OP2—10-YEAR OUTCOME ANALYSIS OF OFF-PUMP SEQUENTIAL GRAFTING: SINGLE SURGEON, SINGLE CENTRE EXPERIENCE

Raja, S.G., Salhiyyah, K., Navaratnarajah, M., Rafiq, M.U., Felderhof, J., Amrani, M.
Harefield Hospital, Cardiac Surgery, London, United Kingdom

Objectives: Despite increasing recognition that off-pump coronary artery bypass surgery and sequential grafting strategy individually are associated with improved outcomes, concerns persist regarding the safety and efficacy of combining these two techniques. We compared in-hospital and mid-term outcomes for off-pump multivessel sequential and conventional coronary artery bypass grafting.

Methods: From September 1998 to September 2008, 689 consecutive patients received off-pump multivessel sequential coronary artery bypass grafting performed by a single surgeon. These patients were propensity matched to 689 patients who underwent off-pump coronary artery bypass grafting without sequential anastomoses. A retrospective analysis of prospectively collected perioperative data was performed. In addition, medical notes and charts of all the study patients were reviewed. The mean duration of follow-up was 5.1 ± 2.0 years.

Results: The major in-hospital clinical outcomes in sequential and control groups were found to be similar. After adjusting for clinical covariates, sequential grafting was not an independent predictor of in-hospital adverse events (odds ratio [OR] 1.18, 95% confidence interval [CI] 0.86-1.50, $P = .31$), medium-term mortality (hazard ratio [HR] 1.26, 95% CI 1.06-1.32, $P = .92$) and readmission to hospital (HR 1.12, 95% CI 0.96-1.20, $P = .80$). Sequential grafting was an independent predictor of receiving greater than three distal anastomoses (OR 7.46, 95% CI; 4.27-11.45, $P < .0001$). Risk adjusted survival was 89% for sequential grafting patients and 88% for conventional grafting patients ($P = .96$) during the medium-term follow-up.

Conclusion: Our analysis confirms the short- and mid-term safety and efficacy of off-pump sequential coronary artery bypass grafting.

OP3—ROBOTIC LEFT INTERNAL MAMMARY ARTERY HARVESTING FOR SINGLE VESSEL MINIMALLY INVASIVE CORONARY BYPASS: A RANDOMIZED CONTROLLED TRIAL

Milanez, A.M.,[1] Dallan, L.A.,[1] Lisboa, L.F.,[1] Vianna, C.B.,[2] Cabeda, E.,[3] Parga, J.R.,[3] Stolf, N.G.[1]
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Objective: The aim of this study is to compare the patency of left internal mammary artery (LIMA) robotically harvested to left anterior descendent (LAD) artery minimally invasive bypass with conventional LIMA to LAD off-pump bypass.

Method: From 2007 to 2010, 36 patients were randomized to either LIMA robotically harvested to LAD artery minimally invasive bypass or standard LIMA to LAD off-pump bypass. Patients assigned to robotic group underwent robotic endoscopic harvesting of LIMA with the AESOP system followed by a small left thoracotomy in the 4th intercostal space for off-pump LAD bypass. Patients assigned to standard group underwent full median sternotomy, open LIMA harvesting followed by off-pump LAD bypass. Transit time flow measurement (Medi-Stim Butterfly Medtronic Inc., Minneapolis, MN) was used for intraoperative evaluation of LIMA to LAD patency. After a mean 24-month follow-up, Multislice Computed Tomography (Aquilion® ONE 320, Toshiba America Medical Systems, Inc., Tustin, CA) was used to evaluate LIMA to LAD midterm patency.

Results: The mean LIMA harvesting time in robotic group was 50.8 ± 11.2 minutes versus 22.7 ± 3.4 minutes in conventional group. There was no significant difference in intraoperative LIMA to LAD flow between robotic and conventional groups (46.18 ± 20.73 mL/min versus 48.65 ± 24.15 mL/min, $P = .84$). There were no significant differences in incidence of wound infection (0 versus 2, $P = .484$) and reoperation for bleeding (0 versus 1, $P = 1.00$) between robotic and conventional groups respectively. In robotic group, Multislice CT revealed patent LIMA graft in 18 (100%) patients versus 17 (94.4%) patients in conventional group ($P = 1.00$). There was no mortality in the study group.

Conclusions: Minimally invasive LAD bypass using LIMA graft robotically harvested was safe and feasible. Early and mid-term LIMA patency was similar between both techniques.

OP4—EVALUATION OF TISSUE DAMAGE IN LESS INVASIVE CORONARY SURGERY BY CIRCULATING ENDOTHELIAL CELLS: IS OPCAB REALLY BETTER THAN MINIMAL EXTRACORPOREAL CIRCULATION?

Wittwer, T.,[1] Choi, Y.-H.,[1] Neef, K.,[1] Schink, M.,[1] Sabashnikov, A.,[1] Teschendorf, P.,[2] Mehler, O.,[2] Wahlers, T.[1]
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Objective: Off-pump coronary artery bypass grafting (OPCAB) and use of minimally extracorporeal circulation systems (MiniHLM) have been proposed to avoid potentially harmful effects of full cardiopulmonary bypass (CPB). Circulating endothelial cells (CEC) are sensitive markers of tissue and endothelial damage and were shown to be significantly elevated in conventional CPB procedures as compared to MiniHLM-revascularisation. Therefore, CEC are considered to be of specific interest in evaluation of effectiveness of MiniHLM and OPCAB as currently applied less invasive coronary procedures.

Methods: 95 consecutive coronary patients were randomly assigned either to OPCAB (n = 45) or to MiniHLM (n = 50) procedures. Perioperative data, clinical and serological outcome and serial measurements of CEC-release and parameters of endothelial function (v.Willebrand-Factor, soluble-thrombomodulin) perioperatively (preoperative-baseline, post-MiniHLM/release of OPCAB-stabilisator, 6h, 12h, 24h and 120h postoperatively) were obtained and compared by ANOVA models including repeated-measures-analysis.

Results: Mean graft-number was 3.1 ± 0.7 in MiniHLM patients and 1.9 ± 0.7 in OPCAB patients ($P < .01$). However, ventilation, ICU, and total hospital times were comparable between groups

as were chest-tube-drainage, transfusion requirements, hemodynamics and catecholaminergic support ($P > .05$). CEC-release was overall comparable between groups and did not show any significant increase over time, accordingly Troponin-levels where generally not significantly different ($P = .108$). No myocardial infarctions, strokes or deaths occurred, Neuron-specific-Enolase was not significantly different between groups ($P = .46$).

Conclusion: Conceptional advantages of closed-minimised-CPB-systems (ROCsafe™) result in morbidity and mortality comparable with OPCAB procedures. MiniHLM therefore minimizes CPB-related systemic and organ injury as demonstrated by low CEC-values which indicates intact endothelial integrity. Furthermore, MiniHLM combines OPCAB-benefits with less morbidity especially in high-risk-patients while facilitating more complete revascularisation in patients with complex lesions.

OP5—BEATING-HEART CORONARY ARTERY BYPASS SURGERY WITH THE HELP OF MINI EXTRACORPOREAL CIRCULATION FOR VERY HIGH-RISK PATIENTS

Munos, E.,[1] Calderon, J.,[2] Lafitte, S.,[3] Labrousse, L.,[1] Roques, X.,[1] Barandon, L.[1]

[1]Haut-Leveque Hospital, Cardiac Surgery, Pessac, France; [2]Haut-Leveque Hospital, Intensive Care Unit Sar 2, Pessac, France; [3]Haut-Leveque Hospital, Cardiology, Pessac, France

Background: Left ventricle dysfunction and comorbidities are responsible for a large number of complications after CABG. The best strategy for these patients, including the use, or not, and type of extracorporeal circulation (ECC), the use of minimized ECC (MECC), or conventional ECC (CECC), remains unclear. The aim of the study was to investigate the potential effect of on-pump beating-heart surgery with the help of MECC (OPBH) in patients with a high-risk EuroSCORE, and to compare this strategy to three other different procedures including OPCAB and MECC or CECC with cardiac arrest.

Methods: Patients were included if their EuroSCORE was strictly > 9. Four groups were retrospectively compared: an OPCAB, an OPBH, a MECC and a CECC groups under cardiac arrest.

Results: 214 patients, mean age 74.26 ± 8.5 years, 68.7% male, were operated. Mean EuroSCORE was 12.1 ± 2.9, left ventricle function 37.4 ± 12.3%, recent myocardial infarction (MI) 49.5%, renal failure 48.1%, chronic obstructive pulmonary disease (COPD) 42.2%, and peripheral vascular disease (PVD) 55.6%. Mean graft per patient was 2.4 ± 0.7. Our study showed that it was possible, in very high risk patients, to carry out revascularisation with OPBH similar to that using MECC or CECC under cardiac arrest (P = NS). This technique reduces troponin release (3.23 versus 6.56, $P < .01$), postoperative myocardial complications (2% versus 8%, $P < .01$), cardiotonic drug prescription (15.7% versus 31.3%, $P < .01$), ventilation time (4.57H versus 6.48H, $P < .01$) and LOS in ICU (2.16 versus 2.53, $P = .02$).

Conclusion: The OPBH method seems to be safe, secure, and effective in this population of very high-risk patients, reducing early complications and multi-organ failure. OPBH surgery combining MECC without aortic cross clamping makes it possible to perform complete revascularization and is an interesting alternative for CABG in high-risk patients.

OP6—RESULTS OF CORONARY BYPASS GRAFT SURGERY IN A CENTER OF ARGENTINA: PREDICTORS OF IN-HOSPITAL DEATH

Kerbage, S.,[1] Giunta, G.,[1] Gallucci, E.,[1] Abud, J.,[2] Dulbeco, E.,[1] Rafaelli, H.,[1] Bozovich, G.,[1] Varela Otero, P.,[1] Favaloro, R.[1]

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Purpose: To evaluate the characteristics of population of CABG. The rate of major and minor complications and predictors of periprocedural death (POD) is also explored.

Methods: Patients (p) who underwent CABG were selected for the analysis. Combined procedures (valvular, peripheral bypass, or surgery for ventricular remodeling) were excluded. Rates of death, periprocedural myocardial infarction (PMI), and stroke or transient ischemic attack (STK) were assessed as mayor complications. Minor complications include requirement of aortic counterpulsation (IABP), low volume syndrome (LVS), atrial fibrillation (AF), complete AV blockade (CAVB), acute renal failure (ARF), mediastinitis (MED), and prolonged mechanical ventilation (PMV). Independent predictors of POD were calculated by multiple logistic regression.

Results: 1141 (p) were included. The average age was 62.2 ± 9.4 years, and the Parsonnet score 5.2 ± 4. Most of the (p) were men (84.8%). Hypertension was present in 80.4%, dyslipidemia in 71.2%, diabetes in 28.3% and smoking in 61.3%. A total of 41% showed antecedents of myocardial infarction, 14.1% peripheral artery disease, and 5.3% stroke. There was 60 (p) with chronic kidney disease. The larger part of (p) demonstrated three vessels disease (85.8%) compromising left main coronary branch in 28.2%. The vessels used for grafts (3.3 ± 0.9) were left mammary artery (96.3%), right mammary artery (15.3%), both mammary arteries (14.8%), radial artery (9.2%), and venous bypass (92.6%). The rate of POD, PMI, and STK were low (3.2%, 8.4%, and 2.3%, respectively). Minor complications were also present: IABP (5.8%), LVS (22.8%), AF (%), CAVB(2%), ARF (15.3%), and PMV (8.2%). In multivariate analysis to predict POD, PMI ($P < .05$), ARF ($P < .0001$), STK ($P < .001$), Parsonnet score ($P < .05$), bomb time ($P < .01$), and number of grafts ($P < .05$) were independent predictors of in-hospital death.

Conclusion: In Argentina (p) referred to revascularization are extensively ill, showing high prevalence of coronary risk factors and previous disease. CABG has acceptable complications and results.

OP7—LONG-TERM SURVIVAL IN PATIENTS UNDERGOING CONVENTIONAL VERSUS COMPLETE ARTERIAL REVASCULARIZATION FOR CORONARY ARTERY DISEASE

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Introduction: Improved outcomes after using the left internal mammary artery (LIMA) to bypass the left anterior descending coronary artery (LAD) suggest that arterial grafts might be better than saphenous vein grafts as conduits for coronary artery bypass grafting (CABG). The aim of the present study was to investigate

long-term survival after complete arterial revascularisation and to identify patients who might benefit from this form of surgery.

Material and Methods: We retrospectively analyzed all patients that underwent isolated coronary artery bypass grafting by medial sternotomy using extracorporeal circulation at our institution in the year 2000. Data were collected from the hospital information system.

Results: We evaluated 766 patients (21.9% female; median age 66 years, min: 34 years, max: 87 years), 127 underwent complete arterial coronary artery bypass grafting. Completeness of follow-up was 98.4%. We found an overall survival at ten years of 64.7%. There was no statistically significant difference in survival at ten years between the patients who received complete arterial revascularization and those who did not (64.8% versus 64.6%). However in female patients survival at ten years was significantly better when complete arterial revascularization was performed (69.6% versus 62.0%; $P < .01$). In patients with impaired kidney function, long-term survival at ten years was significantly better when complete arterial revascularization was not performed (41.4% versus 20.0%; $P < .01$).

Conclusion: Our data suggest that complete arterial revascularization has no general positive effect on long-term survival in patients undergoing coronary artery bypass grafting. However women seem to benefit from complete arterial revascularization in terms of long-term survival. In patients with impaired kidney function conventional revascularization seems to be associated with better long-term survival.

OP8—ONE-YEAR RESULTS OF SURGERY PERSISTANT ATRIAL FIBRILLATION DURING CABG OPERATIONS

Chernjavsky, A., Pokushalov, E., Kareva, Y., Pak, I., Romanov, A., Rachmonov, S.

Federal State Institution Academician E.N. Meshalkin Novosibirsk State Research Institute of Circulation Pathology Rusmedtechnology, Novosibirsk, Russian Federation

Objective: This study was designed for evaluation of the efficiency of combined operations CABG and ablation for AF.

Methods: 184 patients with AF (60 permanent, 77 paroxysmal, 47 persistent) and ischemic heart disease underwent open heart surgery with combined intraoperative ablation, using Cardioblate system (Medtronic, Minneapolis). The mean age of patients was 60.8 ± 0.7 years. The mean AF duration was 59.5 ± 6.1 months. Patients with persistant AF were divided into two groups. In the first group (n = 26) - was performed radiofrequency pulmonary vein isolation, in the second group (n = 21) - radiofrequency modify mini-maze procedure. Implantable Loop Recorders (ILR) for monitoring cardiac rhythm were implanted in 47 patients. Endocardial electrophysiologic examination was performed on 17 (I group-8, II group-9) patients with CARTO XP system before discharge.

Results: No reoperation due to bleeding, and no hospital mortality in patient with persistant AF. Mean follow-up 12 ± 2.1 months freedom from AF in I group was 72% and II group-73.4%. These results were confirming on data ILR systems. During mapping was documented transmural lesion in ablation sites in most cases. But we have 5 patients with different ablation defects around pulmonary veins, and 1 patient was with electrical activity in the line to mitral valve.

Conclusions: Pulmonary vein isolation eliminated persistant AF in 72% patients. The efficiency of radiofrequency modify mini-maze procedure was 73.4% in patients with persistent AF. ILRs can objectively record heart rhythm for a long period of time, as well as the timely detection of asymptomatic arrhythmias and recognize the symptomatic detection. Electrophysiological examination using CARTO XP system in patients after radiofrequency ablation AF with Cardioblate system during CABG operation allow to confirm transmurality of ablation lines, and detect viable areas of atrial tissue, which may to initiate and maintain AF.

Session: General Thoracic Surgery I

MONDAY, JUNE 13, 2011, 15:30 – 17:10 H

OP9—SURGICAL TREATMENT OF ACUTE PULMONARY EMBOLISM: A 12-YEAR RETROSPECTIVE ANALYSIS

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Objectives: Surgical embolectomy for acute pulmonary embolism (PE) is considered to be a high-risk procedure with a high mortality and therefore seen as a last resort in the treatment of critical PE patients. We made a 12-year retrospective analysis of patients undergoing surgical embolectomy at our department to evaluate the indications, the postoperative course, mortality, and the role of the procedure in modern treatment of acute PE.

Methods: All patients who underwent surgical embolectomy for acute PE were retrieved from our clinical database. Patient records were reviewed to register preoperative and postoperative data. The mortality was extracted from the Danish mortality register.

Results: From October 1998 to July 2010, 33 patients underwent surgical embolectomy. All procedures were done through a median sternotomy and extracorporeal circulation. Median age was 55 years (range, 19 to 77 years). Twenty-one patients were diagnosed with a high-risk PE and 12 with an intermediate risk PE. Six patients had been treated with thrombolysis, but with insufficient response. The remaining patients either had contraindications for thrombolysis or intracardial pathology (Myxoma, persistent foramen ovale, or atrial thrombus) with the need of surgical repair. Six patients were brought to the operating theatre in cardiogenic shock, 8 needed ventilatory support, and 1 was in cardiac arrest.

The postoperative 30-day mortality was 6%, and during the 12-year follow-up the cumulative survival was 80% with only 4 late deaths.

Conclusion: The principal finding of this study is that surgical pulmonary embolectomy can be performed with low mortality although the treated patients belong to the most compromised part of the PE population. The results in our study are well inline with the most recent reports on pulmonary embolectomy in acute PE patients from other centers. The result supports surgical embolectomy as a vital part of the treatment algorithm for acute PE.

OP10—INCIDENCE OF REPERFUSION PULMONARY INJURY IN PATIENTS WHO HAVE UNDERGONE PULMONARY ENDARTERECTOMY: DISTAL VERSUS PROXIMAL DISEASE

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Objectives: Pulmonary Endarterectomy (PEA) is an established and curative treatment for Chronic Thromboembolic Pulmonary Hypertension (CTEPH). More than 2600 patients have undergone PEA at the University of California San Diego (UCSD) Medical Center. Over the last few years we have been witnessing an increasing number of patients with distal thromboembolic disease. Patients with more distal clot offer the greatest technical and postoperative challenge. Reperfusion Injury (RPI) is the leading cause of postoperative morbidity requiring prolonged ventilation and hospital stay, yet there is a paucity of evidence associating the risk of RPI with specific disease type. We hypothesized that Type III patients will have an increased incidence of RPI.

Methods: We retrospectively analyzed our data for the last 500 patients (2006 to 2010). We looked at the ventilation time, incidence of re-intubation, as well as hospital stay as indicators for clinically significant RPI. We further analyzed the results in patients with Type III disease versus all others.

Results: The overall hospital mortality was 2.2%. The most common complication was RPI. RPI requiring prolonged ventilation of over 72 hours or re-intubation occurred in 14.6%. Mortality and RPI were similar in all groups. Patients with bilateral Type III had a mean ventilation time of 87.3 ± 189.4 hours (median 22.0 ± 19.3) versus 74.1±146.1 hours (median 22.0 ± 8.4) in others, P = .2818. Postoperative length of stay was 14.3 ± 10.4 days versus 13.5 + 8.0 days (P = .8894). There was no statistically significant difference between groups.

Conclusions: Pulmonary endarterectomy is curative and greatly superior to any medical therapy. The procedure is safe and should be offered to all patients who have evidence of CTEPH including those with so-called "distal disease." These patients enjoy the same hemodynamic benefit with no increased risk of postoperative morbidity or mortality.

OP11—INITIAL EXPERIENCE WITH THE USE OF BIOLOGICAL IMPLANTS FOR TISSUE RECONSTRUCTION IN GENERAL THORACIC SURGERY

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Objectives: Synthetic materials have traditionally been used for tissue reconstruction in Thoracic Surgery. New biomaterials have been tested in other areas of surgery with good results. The aim of our study is to evaluate our initial experience using based prostheses in complex thoracic surgery.

Methods: Prospective review was performed of all patients who underwent complex surgical procedures requiring soft tissue reconstruction from August 2009 to February 2011. Thirty-one consecutive patients were included, median age 66 years (55-89 years). Operations involved radical pleurectomy/decortication (n = 19), intrapericardial pneumonectomy/lung resection (n = 5), diaphragmatic reconstruction (n = 2), pericardial replacement (n = 1), chest wall excision (n = 2), and repair of oesophagus (n = 2, one perforated and one anastomotic leak).

Results: A total of 54 patches were used in the 31 patients (ranging 1 to 3 per patient). Median hospital stay was 13 (range 5 to 149) days. Two patients died; one developed pulmonary embolism 5 days after intrapericardial pneumonectomy and another patient suffered from severe pneumonia and empyema after radical pleurectomy/decortication dying 26 days post-surgery. No patient has an active infection or required removal of patches or reexploration.

Conclusions: Our initial experience of using bioprosthetic patches for soft tissue reconstruction in thoracic surgery has proven satisfactory. We have employed them in complex procedures, with acceptable overall results.

OP12—MALIGNANT PLEURAL MESOTHELIOMA: EXPERIENCE MULTIDISCIPLINARY PUBLIC TERTIARY HOSPITAL

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Objectives: To evaluate the experience in the diagnosis and treatment of MPM accumulated during eight years in a public tertiary hospital.

Methods: Retrospective evaluation of medical records of patients diagnosed with MPM between December 1999 and December 2010. The definitive diagnosis was established by histological studies of the pleura, and the staging was based on clinical and imaging evaluation. All patients underwent chest radiography and computed tomography (CT) for locoregional staging. Patients with advanced disease or poor clinical condition were submitted to CT scan and further examination, while patients with localized disease in the hemithorax underwent a CT scan and CT scan positron emission tomography - PET Scan (from

2002). All patients were initially considered for multimodal therapy (pleuropneumonectomy with adjuvant chemotherapy and radiotherapy), and the staging and clinical examination findings crucial to the therapy. The chemotherapy regimen used included: cisplatin and doxorubicin, and more recently pemetrexed.

Results: We analyzed 50 patients, 39 men, mean age 57 years (ranging between 13 and 79 years). The biopsy specimens for histopathology were obtained by thoracoscopy in 25 patients (50%), Cope needle in 21 (42%), and pleural biopsy by minithoracotomy in 4 (8%). The histological types were epithelioid in 37 patients (74%), sarcomatoid in 4 (8%), biphasic in 7 (14%), and desmoplastic in 2 (4%). The therapeutic approaches were multimodal (pleuropneumonectomy associated with radiotherapy and chemotherapy) in 20 patients (40%), chemotherapy and radiotherapy in 7 (14%), radiotherapy alone in 4 (4.4%), and chemotherapy alone in 18 (36%). The median overall survival from the diagnosis was 13.9 months (ranging between 1 and 40 months).

Conclusions: The data obtained in our study (the largest Brazilian series) show that this is a highly aggressive disease and demonstrate that the profile of mesothelioma patients in Brazil is similar to those observed in other countries.

OP13—THE FACTORS AFFECTING THE MORBIDITY AND MORTALITY IN THORACIC TRAUMA: AN ANALYSIS OF 220 PATIENTS

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Background: Thoracic trauma is one of the most challenging problems for thoracic surgeons. In this study we evaluate to the factors effects of trauma on mortality and morbidity.

Method: A retrospective analysis of 220 cases of thoracic trauma, seen between 2003 and 2009, is presented. The majority of the patients were male (male-female ratio 3.7:1) and the average age was 45.1 (3-84) years. We used the injury severity score (ISS) to assess the severity of trauma. Also included associated with trauma location.

Results: Blunt trauma (81%, n = 179), especially motor vehicle accidents (50.2%) and falls (16.1%) were the most frequent causes of chest injury. Also penetrating trauma was seen in 39 patients (19.7%). Mean hospital stay was 8.6 (1-35) days. Isolated thoracic trauma was seen in 126 patients. Rib fractures (n = 145), pulmonary contusion (n = 26), hemopneumothorax (n = 51), and isolated hemothorax (n = 43) were the most frequent lesions. Approaches were thoracotomy (n = 21), thoraco-abdominal insicion (n = 6), and median sternotomy (n = 2). Main indications for thoracotomy were pulmonary laceration (n = 5), great vessel injury (n = 3), and diaphragm rupture (n = 4). For the majority of cases observation and/or tube thoracotomy (47%). Mechanical ventilation (10%, n = 21) were sufficient and these patients' mean ISS was 62.8. Morbidity and Mortality ratios were 11% and 14% respectively. For patients who did not survive, the average ISS was 45.1.The average ISS for the total group was 23.8 (4-75). In a survival analysis the ISS was found to be the most significant determining survival ($P < .0001$). Compared ISS ratio between injuries included cranial (n= 27, mean ISS; 48.4 [SD: 23.9]), and abdominal (n = 12, mean ISS; 49 [SD: 22.3]) ($P = .14$). The patients with cranial trauma have a higher mortality rate (ratio; 9/18, 50%) then with abdominal (ratio; 1/11, 9%) ($P = .022$). Mean hospital stay higher in association with cranial trauma (13.4 [SD = 7.85]) than with abdominal trauma (9.8 [SD=4.15]) ($P = .04$).

Conclusion: Mortality after thoracic trauma remains relatively high, especially in case of associated neurotrauma. The ISS is a valuable score for assessing the severity of trauma and predicting outcome.

OP14—MANAGEMENT OF INTRATHORACIC ESOPHAGEAL PERFORATION: ANALYSIS OF 16 CASES

Tettey, M.M.K.,[1] Aniteye, E.,[1,2] Edwin, F.,[1] Sereboe, L.,[1] Tamatey, M.,[1] Kotei, D.,[1] Frimpong-Boateng, K.[1]
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Background: Intrathoracic esophageal perforation remains a life threatening lesion that needs early diagnosis and appropriate intervention to reduce morbidity and mortality. Management depends largely on the cause of perforation, the integrity of the esophagus, and the time lapse between perforation and commencement of treatment.

Objective: To evaluate the management options that were employed in the treatment of patients with esophageal perforation and the outcome.

Patients and Methods: The records of 16 patients who were operated on from 1994 to 2009 were retrospectively reviewed. Malignant esophageal perforations were excluded from the study.

Results: There were 11 males and 5 females. Their ages ranged between 2 and 66 years (mean 36.4). The etiology was iatrogenic in 10 (62.5%), foreign bodies 5 (31.2%), and spontaneous in 1 (6.2%). Six patients (37.5%) presented within 24 hours of injury, and 10 patients (62.5%) presented after 24 hours. Thoracotomy and intrathoracic primary repair was possible in 5 (31.2%) cases. Esophagectomy, cervical esophagostomy, and feeding gastrostomy was carried out in 11 (68.8%) patients. Esophageal substitution was by colon, routed retrosternally. One patient (6.2%) died after esophagectomy from overwhelming sepsis.

Conclusion: Esophageal perforation is a life threatening condition. Early diagnosis and the institution of prompt and appropriate treatment ensure good outcome.

OP15—OUR EXPERIENCE WITH THE DIAGNOSIS AND TREATMENT OF ESOPHAGUS PERFORATION

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Introduction: We are presenting our experience in the diagnosis and treatment of esophageal perforations, emphasizing various etiology and the attempt of a single and aggressive treatment.

Materials and Methods: We studied esophageal perforations treated between 2002 and 2009 in a Thoracic Surgery Department; there were 7 cases (2 women and 5 men, ages between 29 and 69 years); there were 3 foreign body, 1 postsurgical procedure, 1 stented esophageal neoplasm, 1 instrumental maneuver,

1 Baorhave Syndrome; 1 followed conservatory treatment, 4 first intention suture, and 2 pleural drain and alimentary tract derivation; the interval between the perforation and treatment was between 12 hours and 4 days; we used alimentary tract derivation only for the 2 stenosis (postcaustic and neoplasic).

Results: There was only 1 death (stented esophageal neoplasm); the hospitalization was between 17 and 35 days (Boerhave Syndrome); the case that was treated conservatory (cervico mediastinitis after swallowing of a fish bone) was cured without any sequels; serial surgical procedures were done only for the Boerhave Syndrome.

Conclusions: The diagnosis was based on clinics; contrast substance ingestion confirmed only the topography of the lesion; first intention suture is the safer method for the treatment no matter the time span from the perforation; pleural drain and alimentary tract derivation are only for final cases.

Congenital Heart Diseases I

MONDAY, JUNE 13, 2011, 15:30 – 17:10 H

OP16—HOMOGRAFTS AND XENOGRAFTS: LONG-TERM PERFORMANCE IN THE RIGHT VENTRICULAR OUTFLOW TRACT IN CHILDREN

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Background: Valved conduits are preferred to establish a continuity between the right ventricle and the pulmonary artery in children.

Objectives: This study aimed to compare the long-term performance of cryopreserved valved homografts and glutaraldehyde-fixed xenografts in right ventricular outflow tract (RVOT) reconstruction in infants, children, and adolescents.

Patients and Methods: Between 1987 and 2009, 276 homografts were implanted in children (median age 5, range 0-17 years) and xenografts in 209 children (median age 2, range 0-18 years) for anomalies requiring a right ventricle-pulmonary artery connection. Anatomic factors for which both were implanted were analyzed.

Results: Follow-up was 100% complete. At a median follow-up of 13.3 (range 0-21.7) years, Kaplan-Meier overall survival rate is 79.0 ± 2.5% and 78.1 ± 2.5% at 10 and both 15 and 20 years, respectively, for patients who underwent homograft implantation. Cumulative freedom from homograft failure is 76.4 ± 3.1% and 61.0 ± 3.9% at 10, and both 15 and 20 years respectively. Likewise, at a median follow-up of 10.18 (range 0-12.7) years in children whom xenograft implantation was performed, overall survival rate is 89.47 ± 2.18%, 87.89 ± 2.4%, 82.72 ± 5.5% at 1, 5 and 10 years respectively. Cumulative freedom from xenograft failure is 97.58 ± 1.19%, 88.9 ± 2.81%, and 68.82 ± 11.9% at 1, 5, and 10 years, respectively. Anatomic factors for which both were implanted were not statistically significant ($P = .08$). In terms of patient survival rate at 10 years, xenograft fared better than homograft ($P < .005$). However, freedom from reoperation revealed that homografts lasted longer than xenografts ($P < .001$).

Conclusions: This study demonstrated that the long-term function of homograft is highly satisfactory. Xenografts, owing to its availability and its large range of sizes, is a valid alternative for RVOT reconstruction.

OP17—TRIPLE VALVE REPAIR IN CHILDREN WITH RHEUMATIC HEART DISEASE: LONG-TERM EXPERIENCE

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Objective: Triple valve replacement has poor early and long-term results, particularly in children. Little data is available on triple valve repair. We report our single-center long-term results on combined aortic, mitral, and tricuspid valve repair in rheumatic children.

Patients and Methods: Ten children with severe rheumatic aortic, mitral, and tricuspid regurgitation (mean age 12 ± 3 years) underwent triple valve repair over a 17-year period, using tailored cusp extension to repair the aortic valve, and ring annuloplasty and Carpentier's techniques to repair the mitral and the tricuspid valves.

Results: There were no early deaths. During a median follow-up of 58 months (range 3 months to 16 years), no late death occurred, and 4 patients (40%) required reoperation at a median of 3 years (range 2.7 to 12 years), 1 for mitral valve replacement, 1 for aortic valve replacement, and 2 for aortic and mitral valve replacement. Freedom from reoperation was 100% at 1 year, 63 ± 17% at 3, 5, and 10 years, and 47 ± 19% at 15 years.

Conclusions: Triple valve repair, in this particularly challenging patient group, provided satisfactory initial and mid-term results, with a high burden of reoperation at the long-term, allowing a median of 3 years of growth and subsequent placement of a larger valve at the time of actual valve replacement. This strategy could be considered a good palliative surgical approach.

OP18—THE GROWTH OF CONGENITAL HEART DEFECTS IN THE MIDDLE EAST: AN ALARMING THREAT TO THE RICH & POOR: THE TRUE SECRETS, AND CHALLENGING MEASURES

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Introduction: The Middle East is a region that encompasses Western Asia and North Africa. The population of the Middle East almost tripled between 1970 and 2010, with an estimated 2010 population of about 350 million. Health issues are dealt with according to 2 axes: health of individuals and infrastructure and services. There is often a link between the two, but matters like lifestyle, food habits, and economic infrastructure are also vital factors in determining the health of a country's inhabitants. CHD has been sharply increasing with an alarming fashion in this part of the world in comparison to the rest of the globe.

Methods: A retrospective observational study to most of the available data from various parts of the Middle East with a comprehensive look at the true facts behind the significant growth and possible measures taken by some countries in the region to tackle this danger.

Results: Congenital Heart Defects had become a living nightmare in the Middle East that affects rich and poor in the region. This is a wake-up call to the governments in the Middle East that CHD is a danger that needs to be urgently evaluated, challenged, and properly dealt with.

OP19—PLEURAL FLUID TRIGLYCERIDE CHOLESTEROL RATIO IN CHYLOTHORAX

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[1]KFSH&RC, Jeddah, Saudi Arabia; [2]Mansoura University, Mansoura, Egypt

Introduction and Aim of the Work: Very little if any is discussed in the recent cardiothoracic surgery publications about Triglyceride Cholesterol Ratio value either in the diagnosis or the prognosis of Chylothorax.

Patients and Methods: A retrospective analysis of 60 patients of chylothorax with a mean age of 21 months (range, 1 month to 65 years) who developed chylothorax after heart surgery (January 2007 through December 2010). Data were collected regarding demographics, method of diagnosis, surgical procedures, characteristics of chylous drainage, and its management. The patients were divided into 3 groups: Group 1 (ratio < 1), Group 2 (ratio between 1 and 2), and Group 3 (ratio > 2).

Results: Eighteen cases had a ratio < 1, 14 had a ratio between 1 and 2, and 28 had a ratio > 2. There were 2 hospital mortalities; both had a triglyceride/cholesterol ratio > 2. All patients responded to the conservative treatment except 2 cases who required further thoracic duct ligation.

Conclusions: Pleural Fluid Triglyceride Cholesterol Ratio in Chylothorax can be used in the diagnosis of chylothorax and more importantly as a prognostic detector in cases of post cardiac surgery chylothorax.

OP20—EXPERIENCE IN THE PRACTICAL USE OF LEVOSIMENDAN IN CHILDREN IN KUWAIT

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Introduction: Levosimendan is a new calcium-sensitizing drug that opens adenosine triphosphate-dependent potassium (KATP) channels with effects that increase myocardial contraction and cause vasodilatation. Its main potential advantages are the improvement of myocardial contractility without increasing oxygen requirements, reduction of ventricular preload, and an anti-stunning, anti-ischemic effect by opening KATP channels.

Methods: A retrospective observational study in our pediatric intensive care unit, in which more than 50 patients received levosimendan. There were no adverse events attributable to levosimendan and no instances where the clinical condition worsened after administration. Arterial lactate levels decreased significantly following levosimendan administration during cardiopulmonary bypass for anticipated low cardiac output. In those with established low cardiac output, trends toward improved hemodynamics were seen, with heart rate reduction, an increase in mean blood pressure, a reduction in arterial lactate, and reduced conventional inotrope use.

Results: Levosimendan was safely and successfully used in a significant number of pediatric patients with established low cardiac output state who demonstrated improved hemodynamics and tissue perfusion, with a tendency to reduced conventional inotrope usage, and this warrants its evaluation as an inotrope in the pediatric population.

Adult Cardiac Surgery II

MONDAY, JUNE 13, 2011, 17:40 – 18:40 H

OP21—IMAGE GUIDED NAVIGATION FOR MULTIVESSEL CORONARY ARTERY BYPASS GRAFTING

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Objectives: We recently reported successful registration mechanisms with the Cardio-Pointer navigation system. This study was performed to evaluate its accuracy in navigated multivessel-CABG procedures.

Methods: In a prospective study pre- and postoperative multislice computed tomography (MSCT) was performed in 11 patients to

(i) exactly plan the position of the anastomoses,

(ii) extract 3D data for intraoperative registration, and
(iii) postoperative position control of distal anastomoses.

Intraoperative navigation was performed at the ischemic and surgically positioned heart (Fig. 1). The pointer position in relation to the planned anastomosis target is displayed in real-time to the surgeon (Fig. 2).

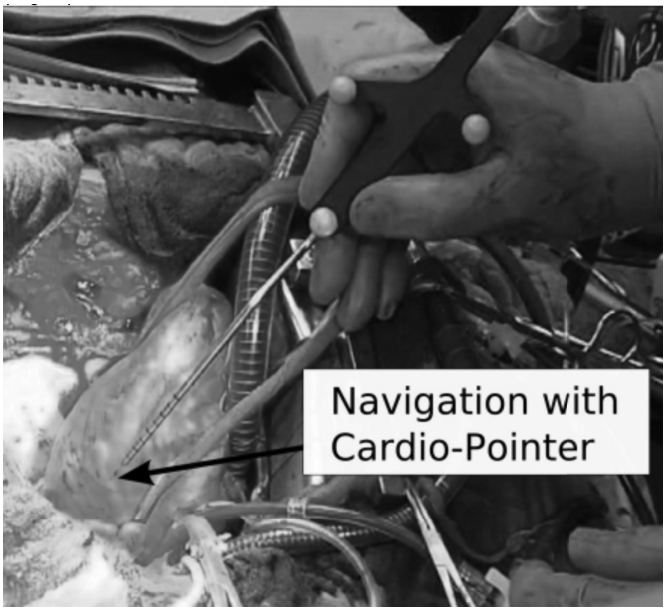

Figure 1.

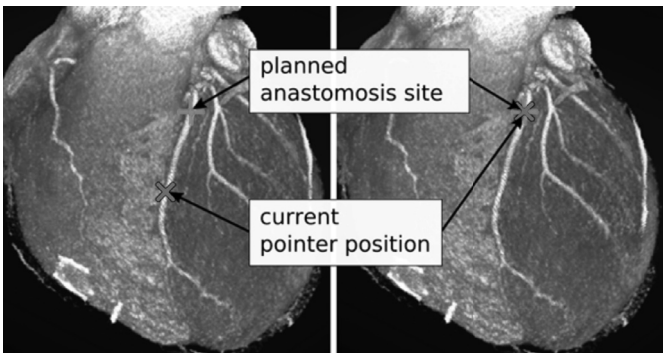

Figure 2.

Results: Positions of 25 distal anastomoses were planned according to preoperative MSCT data. Twenty-one positions could be identified through navigation and performed as planned to the anterior wall (n = 8), lateral wall (n = 9), and posterior wall (n = 4). Postoperative MSCT controls revealed a navigation accuracy of 2.3 ± 1.5 mm for anterior wall anastomoses, 2.2 ± 1.5 mm for lateral wall anastomoses, and 2.1 ± 1.5 mm for posterior wall anastomoses. All grafts were patent. Anastomoses could not be performed as planned because of dangling at the operation table (n = 2), target vessel to small (n = 2), and registration of wrong vessel (n = 1). Time required for intraoperative data recording, registration, and navigation was 3.7 ± 0.5 minutes per anastomosis.

Conclusions: This is the first study about image-guided navigation in multivessel-CABG at the ischemic, deformed, and surgically positioned heart. We could demonstrate a high precision of the system, which is within measurement accuracy of a surgeon. Its overall clinical value remains to be determined by further studies.

OP22—MIDCAB VERSUS CONVENTIONAL CABG: PERIOPERATIVE RESULTS OF SINGLE VESSEL ANASTOMOSIS (LIMA-LAD). RETROSPECTIVE COMPARATIVE STUDY OF EGYPTIAN 10-YEAR-EXPERIENCE

Fouad, A.S.,[1,2] Khallaf, A.N.,[1,2] Eltawil, T.,[1,2] El Azem, A.A.,[1,2] El Fiki, M.,[1,2] Elkadi, H.[1,2]

[1]Cairo University, Cardiothoracic Department, Cairo, Egypt; [2]Ain Shams University, Cardiothoracic Department, Cairo, Egypt

Objectives: A retrospective comparative study to review early outcome of a single center (Naser Institute Hospital) of both conventional CABG via full sternotomy and MIDCAB via mini-thoracotomy, for single vessel anastomosis (LIMA to LAD), over a period of about 10 years.

Patients and Methods: All patients who underwent LIMA-to-LAD anastomosis through mini-thoracotomy in the period (19/11/2001 to 16/12/2009) in Naser Institute Hospital (62 patients) are selected for comparison with those who underwent single vessel anastomosis (LIMA-LAD) through complete median sternotomy without CPB in the same period in the same center (730 patients).

Results: In the MIDCAB group of patients results of operative time, postoperative morbidities, postoperative course, and in-hospital mortality were found comparable to results in the conventional CABG group with superior results concerning the need for blood transfusion and postoperative hospital stay in the MIDCAB group, which is consistent with the minimally invasive approach.

Conclusion: Safety and applicability of MIDCAB technique via a mini-thoracotomy in risky patients, in comparison to conventional CABG via full sternotomy, was shown in this study.

Keywords: MIDCAB, Conventional CABG, perioperative outcome.

OP23—USE OF B-TYPE NATRIURETIC PEPTIDE AND N-TERMINAL PRO-B-TYPE NATRIURETIC PEPTIDE AS A PREDICTOR OF EARLY SURVIVAL POST CORONARY ARTERY BYPASS SURGERY IN PATIENTS WITH ACTUE MYOCARDIAL INFARCT

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Objective: Long used as a diagnostic marker of heart failure, concentrations of B-type natriuretic peptides (BNP) and N-terminal pro-B-type natriuretic peptides (NTpBNP) have recently been shown to predict survival outcomes in patients with acute coronary syndromes. Our study aims to identify an association between early outcome post coronary artery bypass graft (CABG) surgery and the BNP/NTpBNP levels in patients during an acute myocardial infarct (AMI).

Methods: A retrospective review of all patients referred for further management between 1 Jan 2010 and 31 Dec 2010 was done. Data collected included patients' demographics, blood investigations, and outcomes.

Results: Two hundred fifty-five patients (mean age 60.8 years) were identified. Eight patients died before operation, and 15 declined. One hundred thirty patients (56%) were readmitted for elective CABG. Of the remaining 102 patients, 6 (2.6%) were emergency operations and 96 (41.4%) were early surgery. Patients for elective surgery had a statistically significant higher BNP (mean 6773) and NTpBNP (mean 8513) levels than the other group with mean 2686 (BNP) and 4277 (NTpBNP) (*P*-value of 0.067 and 0.031, respectively) but no deaths. Patients underwent emergency and early CABG had a NTpBNP mean of 3050 and 4474 respectively, but there was no significant difference in the mean NTpBNP levels of patients who died postoperatively (n = 9). Lower BNP (mean 1144 versus 3200) and NTpBNP (mean 1864 versus 6904) levels were however associated with a shorter length of stay in this group.

Conclusion: Our findings demonstrate that lower BNP and NTpBNP levels are associated with shorter length of stay post surgery. Patients with high BNP and NTpBNP levels may achieve similarly good outcomes if they are fit to be discharged for elective CABG. However, prospective studies involving routine taking of pre-operative BNP/NTpBNP levels may be warranted to better predict and advise on the most suitable timing for CABG surgery following an AMI.

OP24—MYOCARDIAL REVASCULARIZATION VERSUS STENTS

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Objective: The objectives had been analyze the surgical myocardium revascularization versus that done with "stents" in our service and compare the samples of study for major adverse cardiac and cerebrovascular outcomes.

Method: Observational study of cohort type. Analyzed 202 patients submitted to myocardium revascularization in the service between 17 January and 31 July 2009, stratified in: first group G1 formed by patients who had received "stents" and group G2 formed by patients submitted to surgical revascularization. Scripts contend 62 clinics, hemodynamics, and surgical variables for collection of data of patients' records. Univariate analyses using the qui-square and *t* test for independent samples. Significance level of 5%.

Results: We observe highest percentage of women in the group revascularized with "stents" (24% versus 11%) and highest percentage of diabetics in the patients revascularized through the surgery (20% versus 16%). Vide attached tables for socio-demographic information and some preoperative variables.

Conclusions: The evidences allow us to say that the surgical revascularization represents the best procedure to treat patients with multi-arterial coronary disease especially diabetics, as it allows significantly, a more complete revascularization, decreases the number of re internment due to cardiac causes, decreases the reappearance of angina and it improves the quality of life in the postoperative period, with similar hospital and late mortalities.

Table 1. Socio-demographic characteristics

Variable	G1- STENT	G2- CABG	*P*
Number of Patients	112	90	
Gender			0.007
Female	49 (24%)	23 (11%)	
Male	63 (31%)	67 (33%)	
Age	61.50 ± 12.39	61.86 ± 10.85	0.833
Weight	83.50 ± 15.00	74.82 ± 15.95	0.291
Height	1.55 ± 0.06	1.66 ± 0.09	0.107

Table 2. Clinical outcomes

Variables	G1 - STENTS	G2 - CABG	*P*
Postop. M.Infarct			0.302
Yes	6 (3.0%)	2 (1.0%)	
Postop. stroke			0.503
Yes	2 (1.0%)	0 (0.0%)	
Angina reappearance			0.022
Yes	12 (6%)	2 (1%)	
Hospital mortality			0.064
No	107 (53%)	79 (39%)	
Yes	5 (2%)	11 (5%)	

OP25—THREE-YEAR FOLLOW-UP IN HIGH-RISK PATIENTS RANDOMIZED TO OFF-PUMP VERSUS ON-PUMP CORONARY ARTERY BYPASS SURGERY: THE BEST BYPASS SURGERY TRIAL

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Objective: Coronary artery bypass grafting (CABG) is performed both with (on-pump CABG) and without (off-pump CABG) cardiopulmonary bypass. Registry data have indicated that high-risk patients benefit the most from off-pump CABG. The aim of this trial was compared off-pump versus on-pump CABG in patients with a EuroSCORE ≥5

Methods: We randomly assigned 341 patients with 3-vessel disease and a EuroSCORE ≥5 to undergo off-pump versus on-pump CABG. The primary outcome was a composite of major adverse cardiac and cerebrovascular events (MACCE) including all-cause mortality, acute myocardial infarction, cardiac arrest with successful resuscitation, low cardiac output syndrome/cardiogenic shock, stroke, and coronary reintervention.

Results: MACCE occurred in 69 (40%) patients allocated to off-pump versus 54 (33%) patients allocated to on-pump CABG during the median 3.7 years of follow-up (hazard ratio 1.22; 95% CI 0.86 to 1.75, *P* = .26). All-cause mortality was significantly increased in the off-pump group (24% versus 15%, HR 1.66, 95% CI 1.02 to 2.73, *P* = .04), but cardiac-related death was no significantly different (10% versus 7%; hazard ratio 1.30, 95% CI: 0.64 to 2.66; *P* = .47). An insignificant trend towards a reduction of myocardial infarction after off-pump CABG was observed (7% versus 14%; hazard ratio 0.53, 95% CI: 0.27 to 1.04, *P* = .06).

Conclusions: No significant difference in the primary outcome of MACCE was found between off-pump and on-pump CABG. However, mortality seemed higher after off-pump CABG.

Vascular Surgery I

MONDAY, JUNE 13, 2011, 17:40 – 18:40 H

OP26-COLD BLOOD SPINOPLEGIA UNDER MOTOR-EVOKED POTENTIAL MONITORING DETECTS ESSENTIAL SPINAL CORD SUPPLYING ARTERY

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Objective: Motor-evoked potential (MEP) monitoring is used to prevent paraplegia during thoracic aortic surgery, and multidetector computed tomography (MDCT) has been used preoperatively to detect the Adamkiewicz artery (AKA). We have used cold blood spinoplegia during MEP monitoring and detected the change of spinal cord conduction. This study aims to evaluate whether the MDCT-defined AKA is hemodynamically essential and needs to be reconstructed, using spinoplegia under MEP monitoring.

Methods: From 2005 to 2010, both preoperative MDCT and intraoperative neurogenic MEP monitoring with cold blood infusion into the clamped segment of the aorta were done in 22 patients. A MEP drop lower than 50% of the initial value at 3 minutes following cold blood infusion determined the hemodynamic significance of MDCT-defined AKA. AKAs determined as essential were reconstructed, those non-essential were sacrificed.

Results: The AKA was involved in the clamped segment of the aorta in 13 cases. Following cold blood infusion, 10 cases experienced no significant MEP drop and AKA ligation was undertaken, while moderate MEP drop was noted in 1 case prompting reconstruction. None of these 11 cases developed permanent neurologic deficits. In two patients, AKA was reconstructed based on MEP findings, with paraparesis occurring in one case. In 7 cases without AKA involvement in the clamped segment there was no neurological deficit. In 1 case of shaggy aorta, no AKA in the clamped segment resulted in no MEP change during spinoplegia infusion, but change of clamping site decreased the MEP amplitude. In this case spinoplegia theoretically did not flow into spinal cord artery. MDCT-defined AKA was fragile and could not be reconstructed and the patient suffered from palaplegia.

Conclusion: Cold blood infusion may enable decision-making regarding the need for reconstruction of MDCT-defined AKAs. Cold blood-loaded MEP is beneficial to minimize AKA reconstruction time and limit spinal cord ischemia.

OP27—ARTERIAL RECONSTRUCTION WITH CRYOPRESERVED ARTERIAL ALLOGRAFTS. THE ASSESSMENT OF 20 YEARS OF ACTIVITY IN EUROPEAN HOMOGRAFT BANK (EHB) IN BRUSSELS

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EHB has been banking the arterial allografts since January 1991. It collaborates with more than 60 implanting centres in Europe and elsewhere. This paper presents the long-term outcome of those allografts in arterial reconstruction for different indication.

The arteries of the donors 12 to 60 years of age are morphologically evaluated in the Class A laminar flow, incubated in the antibiotic cocktail, cryopreserved and stored in the vapor phase of liquid nitrogen for up to 5 years. They are allocated on basis of the indication and state of emergency, after discussion with the implanting surgeon.

A total of 1838 cryopreserved arterial segments (ascending and descending aorta, arch, aortic bifurcation, iliac and femoral arteries, pulmonary non valvular conduit) have been used in different emergency and elective situation during last 20 years (1991–2010). The most important indications were the infected prosthetic material after arterial reconstruction (1047 cases or 57%) and native arteries and mycotic aneurysms (191 or 10.4%), critical ischemia with no available autologous venous material (250 cases or 13.6%), arterial injury (45 cases or 2.4%), arterial thrombosis (39 cases or 2.1%), arterial allograft degradation (13 cases or 0.7%), malignant infiltration of the trachea (3 cases or 0.2%), aortic coarctation (3 cases or 0.2%), heart transplantation (3 cases or 0.2%), and congenital cardiac malformation (244 cases or 13.3%).

The multi-centric data will be presented showing the long-term outcome of the allografts. Complications such as infection and thrombo-embolysm have been reported only in few cases.

The cryopreserved arterial allografts have very low rate of re-infection and thrombo-embolism, therefore they are the graft of choice for cases with infected prosthetic and/or native arteries.

OP28—SINGLE CENTER EXPERIENCE WITH HYPOTHERMIC CIRCULATORY ARREST SURGERY FOR THORACIC AORTA PATHOLOGY

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Objectives: We report our center's experience using Deep Hypothermia Circulatory Arrest (DHCA) with or without antegrade cerebral perfusion (ACP) in patients operated on for thoracic aorta diseases.

Methods: From 1998 to 2010 we used DHCA at 18°C as minimum central temperature in 86 patients and ACP in 13 patients with a minimal temperature of 26°C. Male represented 67% (n = 66). Mean age was 61.4 ± 15 years. Fifty-four percent were scheduled and 46% were emergent cases. Forty-one percent of the procedures were performed for acute aortic dissections. Penthotal, hydrocortisone, and manitol were used as neurological protection. During ACP the cerebral perfusion flow was 10mLl/kg/min.

Results: Overall 30-day mortality was 22% (n = 14 emergent; n = 8 scheduled cases). Survival at 1, 5, and 10 years was respectively 70%, 50%, and 22%. DHCA mean time was 32.2 ± 13.4 minutes (range 10-75 minutes). ACP mean time was 46 minutes. Overall stroke rate was 13% (n = 13), all occurred in the DHCA group. Postoperative renal failure without the need of dialysis occurred in 15% (n = 15). Univariate analysis showed preoperative heart failure and age > 70 years as statistically significant for postoperative mortality. Multivariate analysis showed for preoperative history of stroke (OR 10.3 [range 1.2-91.3]) and circulatory arrest time ≥25 minutes (OR 12.3 [range 1.5-98.6]) a significant correlation with high postoperative stroke incidence.

Conclusions: The analysis of that series revealed that postoperative stroke incidence increased in case of stroke history and DHCA more than 25 minutes. These findings modified our practice: using now systematically ACP for patients with a stroke history and when the circulatory arrest time is predicted to be over 25 minutes.

OP29—AORTIC ROOT REPAIR WITH TREE PERICARDIAL PATCH

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Different surgical approaches have been suggested for aortic root repair. We have developed our own operation technique for aortic root repair with preservation of the aortic cusps.

Operative Procedure: Diseased aortic segment is resected above the senotubular junction. Three or more pledgeted mattress sutures are placed from ventricular to aortic aspect in the subannular subcomisural triangles in order to fix the diameter of the annulus. The sinuses of valsava then are plicated from the annulus towards sinotubular junction. Once we have obtained the normal anatomy of the aortic sinuses and senotubular junction we are proceeding toward stabilization of the aortic annulus and aortic root. Three pericardial patches (one for each sinus) are used to fix the aortic root from outside with previously placed subannular mattress sutures. The patches are fixed one to another with the same subannular mattress suture. The distal end of the patches are fixed at the level of senotubular junction between each other and with commissural aortic wall. In this way we create external wall as the unique structure supporting the aortic root.

From January 2000 to February 2011 we operated on 130 patients. There were 2 hospital deaths. Aortic valve insufficiency was not significant in all but 3 patients for severe aortic insufficiency required aortic valve replacement immediately after procedure. In follow up there was no significant enlargement of the aortic root. Three patients were reoperated for aortic valve replacement.

This technique gives opportunity to fix the aortic annulus, to conserve and repair the sinuses of valsalva, not to use prosthetic material for reconstruction of the aortic root, there is no need for the coronary artery reimplantation and the learning curve for this type of operation is not significant.

Our operation is alternative of valve sparing and Florida sleeve operations.

OP30—AORTIC VALVE-SPARING WITH ROOT REPLACEMENT OPERATION: EARLY AND MIDTERM RESULTS AT A SINGLE UNIVERSITY CENTRE

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Objective: Aortic valve-sparing root replacement operations (AVSRR) provide satisfactory results for various aortic pathologic conditions in selected patients. A retrospective study of early and midterm results is presented in a series of 37 consecutive patients at a single university centre.

Methods: From October 2001 through October 2010, 37 patients (28 male, 9 female) aged 18 to 81 years old (mean 52.5) underwent aortic valve-sparing operation with root replacement. Fifteen patients had aneurysm, 12 had Marfan's syndrome, 9 had dissection, and 1 had aneurysm due to giant cell aortitis.

Transesophageal echocardiogram was performed at the end of each procedure to assess the aortic valve and transthoracic echocardiogram during the yearly follow-up.

Results: Fifteen patients underwent David reimplantation with a straight-tube, 20 had a Yacoub remodelling, and 2 Florida-sleeve procedure.

Ten procedures (27%) were combined (3 Hemiarch, 3 CABG, 2 MV Repair, 2 MAZE (RF), 2 TVA, and 2 PFO closure), and the mean logistic EuroSCORE was 12.25% (3.94%-43.18%).

There was one (2.7%) operative and one late death. One patient required reoperation for bleeding and one required re-established CPB and valve replacement. Mean follow-up was 37.8 months (range 3-120 months).

One patient developed endocarditis and stroke and was treated conservatively.

One patient has developed moderate aortic valve regurgitation and is under monitoring. The rest of the patients are alive and the majority of the patients in NYHA (I).

Conclusions: Aortic valve-sparing root replacement operation is a safe alternative to aortic root replacement with prostheses. However, long-term results are needed in order to define the durability of each method of this technique.

Keywords: Adults; Aortic aneurysm; Valve-sparing; Aortic root replacement.

Congenital Heart Diseases II

MONDAY, JUNE 13, 2011, 17:40 – 18:50 H

OP31—DARING TO START A "NORWOOD PROGRAMME" IN A DEVELOPING COUNTRY!

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Hypoplastic Left Heart syndrome and its variants are lethal if not operated upon in the neonatal period.

Developing a Norwood programme needs many things along with the most valuable component called "expertise and determination." Though finances are most often stated as the main reason for not starting a Norwood programme, it is rather the lack of training and will that deters people embarking the hard path.

We have dared to start a Norwood programme in a developing country based purely upon the strength of expertise and are finding the going getting along. Our first Norwood operation has raised hope for us and all the babies born with hypoplastic left heart syndrome in this part of the world.

What we need is to look back in detail about the problem, the reasons for the nonavailability of the solution and work to find answers to these problems to put things in place and thus help these special babies through their ordeal.

OP32—MULTI-MODALITY IMAGING IN THE EVALUATION OF AORTA-RIGHT ATRIAL TUNNEL

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Background: Aorta-right atrial tunnel is an extremely rare congenital extracardiac vascular communication between heart chambers. We report on the imaging and management of a patient.

Case Report: A 33-year-old female patient presented Streptococcus viridans endocarditis. The echocardiogram showed a mass in the right atrium. Cardiac MRI showed that this mass contained turbulent blood flowing from the aorta to the right atrium. This mass was further defined by a coronary CT and angiography, which identified a posterior aorta-right atrial tunnel of 10 mm of maximal diameter, originating in the left sinus of Valsalva and draining to the RA adjacent to the opening of the coronary sinus.

The large size of this tunnel all the way the distal drainage in the right atrium did not allow for percutaneous occlusion, and the patient was brought to the operating room for repair. The distal opening of the tunnel was identified in the right atrium behind a prominent network of fibers. The proximal ostium of the tunnel was identified in the left sinus of Valsalva. The left main originated from the tunnel 3 cm from the proximal ostium of the tunnel. A patch of bovine pericardium was sutured inside the tunnel, distal to the takeoff of the left main coronary artery. The distal tunnel ostium was oversewn primarily in the right atrium. The patient had an uneventful postoperative course and was discharged on the 5th postoperative day.

Conclusions: Although angiography is the definitive diagnostic imaging, the atypical presentation led to stepwise imaging to reach the final diagnosis. To the best of our knowledge, this report is the first to comprehensively illustrate the characteristic appearance in a single patient by use of the full spectrum of noninvasive cardiac imaging modalities.

OP33—CONGENITAL HEART SURGERY: STANDARDIZED RATIO OF SURGICAL PERFORMANCE ACCORDING TO THE ARISTOTLE COMPLEXITY SCORE

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Background: The Aristotle score quantifies complexity involved in congenital heart surgery. It defines surgical performance as complexity score times hospital survival. We studied how expected and observed surgical performances evolved over time.

Methods: We analyzed 2312 main procedures carried out from 2006 to 2010. Aristotle basic score, corresponding hospital survival, and related observed surgical performance were estimated. Expected survival was derived from mortality risks published by O'Brien and co-authors (*J Thorac Cardiovasc Surg* 2009;138:1139-53). Observed performance divided by expected performance was called *standardized ratio of performance*. This should evolve above 100%.

Results: Mean Aristotle basic score was 7.88 ± 2.68. Fifty-one patients died: observed hospital survival was 97.8% (97.1%-98.3%). One hundred fifteen deaths were anticipated: expected survival was 95.2% (93.5%-96.3%). Observed and expected surgical performances reached 7.71 (7.65-7.75) and 7.49 (7.37-7.59) respectively. Therefore global standardized ratio of performance attained 102.94%. The ratio increased from 2006 (ratio = 101.60%) to 2009 (103.92%) and was 103.42% in 2010. Performance was high for repair of congenitally corrected transposition of the great arteries and ventricular septal defect (VSD) by atrial switch and Rastelli, the Norwood procedure, repair of *truncus arteriosus*, aortic arch repair and VSD closure, and the Ross-Konno procedure, with corresponding standardized ratios of 123.30%, 116.83%, 112.99%, 110.86%, and 110.38%, respectively. With a ratio of 82.87%, performance was low for repair of the Ebstein's anomaly.

Conclusion: The standardized ratio of surgical performance integrates into one value, procedures complexity, postoperative survival, and comparison with expected outcome. It allows accurate quality evaluation of congenital heart surgery programmes over time.

OP34—LONGITUDINAL ASSESSMENT OF ALLOGRAFT FUNCTION USING TISSUE DOPPLER ECHOCARDIOGRAPHY AFTER HEART TRANSPLANTATION

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Purpose: Allograft diastolic dysfunction is a common finding early after heart transplantation (HT) and improves over time in

rejection-free children. We investigated the magnitude and time-course of improvement in allograft function after HT in recipients using serial tissue Doppler imaging (TDI).

Methods: We performed serial TDI assessment in 37 HT recipients (median age at HT 5.3 years, range 2 months-23 years) who underwent HT during 2006-2009 and who remained rejection-free (rejection defined as Grade 2R, ISHLT 2004). We obtained pulse wave TDI systolic (S'), early (E'), and late (A') diastolic peak velocities at the left and right ventricles and the interventricular septum (LV, RV, and IVS, respectively) and compared these data to normal values for recipient age. We used linear mixed models for time-trend analysis to evaluate the effect of time on TDI variables.

Results: A median of 22 (range 9-41) echocardiography studies were performed per patient. Early after HT, S' (LV 87 ± 26% predicted, RV 46 ± 21% predicted, IVS 78 ± 20% predicted), E' (LV 68 ± 33% predicted, RV 42 ± 21% predicted, IVS 63 ± 23% predicted), and A' (LV 65 ± 21% predicted, RV 46 ± 16% predicted, IVS 76 ± 22% predicted) were all significantly impaired ($P < .001$). S', E', and A' velocities for LV, RV, and IVS improved gradually during the first 6 months after HT ($P < .001$ for all by longitudinal analysis). By 6 months after transplantation, TDI values (expressed as % predicted) were normal for LV (S' 121 ± 35%, E' 105 ± 36%, A' 106 ± 24%), had recovered partially for IVS (S' 102 ± 24%, E' 63 ± 24%, A' 103 ± 29%) but remained impaired for the RV (S' 77 ± 16%, E' 81 ± 20%, and A' 82 ± 19%).

Conclusions: Cardiac allograft function is abnormal early and improves to normal for the LV by 6 months after transplantation. The impairment in RV function early after transplantation is more severe than for the LV. RV function improves, but does not recover fully by 6 months.

Adult Cardiac Surgery III

TUESDAY, JUNE 14, 2011, 09:20 – 10:50 H

OP35—DURABLE MITRAL VALVE REPAIR IN CHRONIC ISCHEMIC MITRAL REGURGITATION REQUIRES IDENTIFICATION AND CORRECTION OF PSEUDO-PROLAPSE OF THE ANTERIOR LEAFLET, WHEN PRESENT: A VIDEO AND CASE SERIES PRESENTATION

Youssef, S.J., Geirsson, A., Ayyash, B., Ragnarsson, S., Collazo, S., Hashim, S.

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Objective: Thirty percent of patients with chronic ischemic mitral regurgitation (CIMR) treated with annuloplasty alone have recurrent mitral regurgitation (MR) at 6 months. At reoperation, pseudo-prolapse of the anterior leaflet (PPAL) has been observed. We hypothesize that the identification of this subgroup of patients with PPAL at the primary operation and repair with Gore-Tex neochordae in addition to annuloplasty improves outcomes.

Methods: In this video, we demonstrate how high pressure water testing of the mitral valve after annuloplasty reveals, in some cases, PPAL as demonstrated by either a leak or an asymmetric line of closure. In those patients, Gore-Tex neochordae are sutured to the anterior leaflet to create a line of coaptation.

Results: Forty-six patients underwent mitral valve repair (MVRpr) for CIMR. Twenty-two (48%) were found to have PPAL requiring neochordae in addition to annuloplasty. For this subgroup, the location of neochordae were A2 (n = 2), A3 (n = 11), A2 + A3 (n = 8), and A1 + A2 + A3 (n = 1).

For all patients undergoing MVRpr with or without neochordae, the average age was 65.1 years with 65.2% male. Fourteen (30%) required IABP preoperatively; 14 (30%) had severe pulmonary HTN. Concomitant CABG was performed in all patients. Mitral CE Physio rings were used in all patients with a median size of 28 mm.

Follow-up was available for all patients at an average of 5.96 years. Survival was 79.5% (95% CI 64.2%-94.7%). In all patients, NYHA class improved from a median of 3 pre-op to 1 post-op ($P < .0001$). Ejection fraction improved from 33.2% to 39.5%. ($P = .0017$). MR grade decreased from a median of 4 (severe) to 1 (trace-mild) ($P < .0001$).

Conclusion: Recurrent regurgitation after MVRpr for CIMR can be eliminated with the selective use of Gore-Tex neochordae in addition to annuloplasty. Effective repair of CIMR must include surgical techniques to correct PPAL, when present.

(Data presented: Mitral Conclave 2011)

OP36—PAROXYSMAL AF ABLATION DURING MITRAL VALVE SURGERY: RESULTS OF DIFFERENT APPROACHES

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Background: It is unknown whether pulmonary vein isolation or a maze procedure is needed to ablate paroxysmal atrial fibrillation (AF) in patients with mitral valve disease, but there is no consensus on this issue.

Methods: From 2007 to 2010, 82 patients underwent combined surgical treatment of paroxysmal AF and mitral valve disease. Mitral valve repair was performed to 28 (34.2%) patients, replacement in 54 (65.8%) cases. Ablation procedures included pulmonary vein isolation with left atrial appendage ablation and exclusion (n = 33), PV group; complete left atrial maze–box lesion with mitral line and left atrial appendage ablation and exclusion (n = 49), maze group. In all cases used bipolar device AtriCure or Medtronic CardioBlate. Atrial transport function was evaluated by Doppler echo before operation, at discharge, and follow-up.

Results: We reveal some predictors of AF recurrence: enlarged left atrium > 6.5 cm ($P = .06$), duration of paroxysms > 1 year ($P = .05$), rheumatic ($P = .03$). Freedom from AF at 3-year follow-up was 81.7%, no significantly difference between PV and maze groups in patients without AF recurrence predictors. Fraction filling of left atrium was 32.6% in PV group and 34.1% in maze

group before operation; 28.7% and 20.4% at discharge; 30.6% and 22.3% at follow-up, respectively.

Conclusions: Left atrial transport function was better in PV group patients with paroxysmal AF undergoing mitral valve surgery. But pulmonary vein with LAA isolation may be adequate treatment, particularly in patients with left atrium < 6.5 cm and short duration AF.

OP37—PARADOXICAL ARTIFICIAL CHORDAE TENDINEAE: SIMPLE TECHNIQUE TO PREVENT SYSTOLIC ANTERIOR MOTION POST MITRAL VALVE RECONSTRUCTIONS

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Objective: The mitral valve reconstruction is the procedure of choice for mitral regurgitation with excellent early and late results. The systolic anterior motion (SAM) may occur after mitral valve reconstruction due to different anatomic factors. However, the SAM and consequent left ventricular outflow tract obstruction can occur in more than 16% of the post mitral valve repairs. In this report we describe a new and simple method to prevent the occurrence of SAM after mitral valve plasty.

Surgical Technique: Two artificial chords are subsequently implanted in the posterior annulus, then are anchored to the edge of the anterior mitral leaflet to keep it away from the septum during late diastole, in order to prevent its displacement into the left ventricle out-flow tract during systole.

Results: We have applied this technique on 8 selected patients with severe degenerative mitral regurgitation with redundant anterior leaflet and other factors predisposing them to develop SAM. Intraoperative transesophageal echocardiography and early follow-up transthoracic echocardiography show the absence of SAM and no evidence of MV stenosis.

Conclusions: We propose our technique as an adjunct to mitral valve repairs to eliminate the risk of postoperative SAM in patients with factors predisposing them to develop this phenomenon. Nevertheless, more cases will be required to demonstrate the effectiveness of this technique.

OP38—EARLY RESULTS OF A NEW APPROACH FOR MITRAL VALVE REPAIR

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Objective: A new mitral valvuloplasty technique involving a special annuloplasty strip (Mitralift®) was performed for the past 6 years. Recently, the procedure was applied to patients with mitral stenosis (MS) as well as mitral regurgitation (MR). This study is aimed to assess the efficacy of this new mitral valvuloplasty consisting of a lifting mitral annuloplasty (LMA) with posterior and/or anterior leaflet extension (PLE/ALE) to increase the coaptation surface.

Methods: The medical records of 584 patients (349 females and 235 males) who underwent a new mitral valvuloplasty from March 2008 to December 2010 were retrospectively reviewed. The mean age was 52 ± 15 years. LMA is a new mitral annuloplasty method that involves lifting up of the downwardly displaced LV wall by applying specially designing fabric annuloplasty strip (Mitralift®) on the left atrial wall along the posterior mitral annulus. PLE/ALE was applied to the patients who had contracted mitral leaflet by utilizing a patch of bovine pericardium tailored over a template (SC template®) according to the size of the annuloplasty strip. The patients were divided into two groups: MR group (n = 373) and MS group (n = 211).

Results: There were 6 early deaths (1.0%) and 8 follow-up death (1.4%). Reoperations were performed for recurrent infective endocarditis in 1 case, recurrent MR in 2 cases, and other valve problems in 2 cases. The mean MR grade was decreased from 3.04 ± 0.78 to 0.24 ± 0.58 ($P < .05$) in MR group. Mean effective mitral orifice area was increased from 1.22 ± 0.36 cm^2 to 1.96 ± 0.64 cm^2 ($P < .05$) in MS group.

Conclusions: The early outcome of the described new mitral valvuloplasty shows favorable early results for various types of mitral valve disease.

OP39—TRICUSPID VALVE SURGERY AT FIVE-YEAR FOLLOW-UP: WHICH DETERMINANTS OF OUTCOME REMAIN?

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Objective: We tried to figure out relevant risk factors for poor outcome in patients undergoing tricuspid valve surgery.

Methods: The retrospective study includes 188 consecutive patients who underwent tricuspid valve surgery between 01/2003 and 01/2010. We analysed data of peri- and immediate postoperative course, follow-up was performed via direct interview of the patients and/or their physicians. Mean patient age was 68 ± 11 years; 99 patients were female (53%). Mean follow-up time was 2.4 ± 1.7 years.

Results: All patients suffered from a broad spectrum of concomitant diseases (atrial fibrillation 66%, diabetes 17.5%, COPD 14.4%, pulmonary hypertension 57.5%, and dialysis 5.2%) and were mostly in a poor clinical condition at admission (NYHA III+ 72.3%, chronic right heart insufficiency 69.6%). Tricuspid valve reconstruction was performed in 176 patients (93.8%) using an anuloplasty ring. Most tricuspid valve procedures were performed concomitantly; 57.7% were double valve operations, and in 24.7% patients CABG was done additionally. Mean cross-clamp time was 102 ± 36 min with an average surgery time of 290 ± 97 min. Mean ICU stay was 3.6 ± 1.8 days. IABP or CVVH were installed in 11 patients (6.4%), respectively. Thirty-day mortality reached 3.5%. Overall, 37% of the patients died at last follow-up up to 7 years. Five-year survival was 65%. Determinants for poor long-term outcome were age ($P = .002$), diabetes mellitus ($P = .002$), concomitant CAD ($P = .025$), preoperative dialysis ($P = .036$), and prolonged stay on ICU ($P = .002$). Pulmonary hypertension did not show any significant influence for poor long-term outcome.

Conclusion: In this study we were able to evaluate certain predictors of poor outcome after tricuspid valve surgery. Pulmonary hypertension was no predictor of poor outcome. Despite a high risk population, tricuspid valve surgery results in acceptable clinical outcomes even during mid-term follow-up.

Vascular Surgery II

TUESDAY, JUNE 14, 2011, 09:20 – 10:50 H

OP40—WRAPPING TAPE OPERATION FOR POSTSTENOTIC ANEURYSM OF ASCENDING AORTA DURING AORTIC VALVE REPLACEMENT

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Purpose: To determine possibilities of correction of poststenotic aneurysm of ascending aorta (PAAA) by different methods.

Material: From 1996 to 2008 442 patients (pts) with aortic stenoses (AS) and PAAA were operated in Institute. Average age was 55.1 ± 7.5 years (range 21-71). At all group 7 (1.6%) pts were in II NYHA class, 173 (39.1%) pts in III, 262 (59.3%) pts in IV. Following operations were performed: aortic valve replacement (AVR) + wrapping tape operation (WTO) of AA in 157 (35.5%) pts (group A); AVR without correction of PAAA (diameter of AA 4.8 ± 0.4 cm) in 239 (54.1%) pts (group B); group C is 46 (10.4%) pts with PAAA (diameter of AA 6.5 ± 0.7 cm) underwent Benthal's (n = 42) and Wheat's (n = 4) operations. In group A after AVR nylon tape (diameter 1 cm) was wrapped around AA by 5-9 tours and fixated in proximal and distal part of AA.

Results: Hospital mortality (HM) was 0.6%, 1.3%, and 6.5% in groups A, B, and C, respectively ($P < .05$). During remote period (average 6.5 ± 0.5 years) deaths occurred in 1.3% (n = 2/151), 5.7% (n = 13/227), and 2.5% (n = 1/43) in groups A, B, and C, respectively ($P < .05$). Reoperations (AA's replacement) were performed in 0% (n = 0/151), 2.2% (n = 5/227), and 0% (n = 0/43) in groups A, B, and C, respectively ($P < .05$). Echo examination of diameter of AA for group A: preoperative (PRE) 4.9 ± 0.5 cm, postoperative (POST) (6-7 days) 4.0 ± 0.3 cm, remote period (REM) 4.1 ± 0.2 cm; for group B: PRE 4.8 ± 0.4 cm, POST 4.7 ± 0.3 cm, REM 5.4 ± 0.5 cm; and for group C: PRE 6.5 ± 0.7 cm, POST 3.0 ± 0.3 cm, REM 3.1 ± 0.3 cm . Unsatisfactory results were marked in 1.3% (n = 2/151), 8.4% (n = 19/227), and 2.5% (n = 1/43) in groups A, B, and C, respectively ($P < .05$).

Conclusion: We recommend this method for PAAA (diameter < 5.5 cm) during AVR without prostheses of AA.

OP41—RESULTS OF AORTIC VALVE REIMPLANTATION BY USING VASCUTEK-VALSALVA PROSTHESIS

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Objective: The evaluation of the results of using Vascutek-Valsalva prosthesis in aortic valve reimplantation in patients with ascending aorta aneurism and aortic insufficiency.

Methods: From 2004 to 2010, 54 patients underwent the aortic valve reimplantation procedure. Marfan syndrome was revealed in 25.4% of the patients, and 2 patients (3.7%) of all had bicuspid aortic valve. Four patients (7.4%) of all had chronic aortic dissection type A. Ascending aorta aneurysm with concomitant aortic insufficiency was the primary indication for surgery in all patients. Depending on type of used prosthesis, all patients were divided in a 2 groups:

Group 1: aortic valve reimplantation by using Vascutek-Valsalva (n = 28); Group II: by using linear prosthesis Vascutek (n = 26). To analyze the aortic root dimensions and valve function we performed the echocardiography (TEE or TTE).

Results: The mean follow-up was 50 months. Hospital mortality was 3.6% (1 patient) in a group with Valsalva prosthesis, due to cerebral stroke. There were 2 late deaths at 12 and 36 months in the first and second groups, respectively. At long-term period all patients underwent echocardiography. Significant (>2+) aortic insufficiency (AI) was revealed in 3 patients of the second group, and consecutive aortic valve replacement was performed 24, 36, and 60 months after aortic valve reimplantation ($P > .05$). All of these patients had visual aortic cups destruction. Morphological analysis of aortic valve leaflets has shown the features of inflammation and destruction, which appear due to hydrodynamic blow in prosthesis wall during systole. There were no statistical differences of aortic root dimensions between groups. There were no episodes of clinically significant thromboembolism or endocarditis.

Conclusions: The results of our study provide the advantage of Valsalva prosthesis over the linear prosthesis and provide the good clinical results and minimal risk of valve-dependant complications in aortic valve reimplantation procedure.

OP42—RELOCATION TECHNIQUE FOR A DISLOCATED AORTIC ROOT IN ASCENDING AORTIC ANEURYSM WITH AORTIC VALVE INCOMPETENCE

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Objectives: Longitudinal growth of ascending aortic aneurysms leads to shifting of the valve in caudal direction and rotation of the annulus to longitudinal body axis. Resulting valve distortion may cause prolapse of non-coronary cusp and incompetence of structurally normal valve. Loss of sinotubular junction by aortic dilatation may add to valve incompetence.

Methods: Between Nov. 1998 and Feb. 2011, 44 patients (men:women = 23:21; ages 7 to 82 years, median 67) with

ascending aneurysm, elongation, and incompetence of structurally normal valve (grade III-IV) underwent supracoronary ascending aortic (38 patients) or concomitant aortic arch replacement (6 patients), using a considerably shorter graft than the original aorta. The valve plane was relocated in more cranial/oblique position. Diameter of graft was chosen equal to inner aortic valve annulus. Pre- and postoperative CT was available in 36 patients. Distance between NCL sinus and right-sided rim of brachiocephalic trunk origin (a), between left coronary ostium and the left-sided rim of left subclavian artery origin (b), diameter of presumed sinotubular junction (c), of aortic root at level of coronary ostia (d), of aortic valve annulus (e), and angle between sagital spine plane and presumed sinotubular junction plane (f) were measured.

Results: There was no postoperative aortic valve incompetence in 30 and minimal to mild in 14 patients. There were significant postsurgical changes in all measured CT parameters (a = 20.6 ± 10.4%, b = 13.9 ± 6.2%, c = 21.8 ± 6.3%, d = 6.9 ± 4.7%, γ = 12.0 ± 10.7%) corresponding with reduction of aortic incompetence (AIΔ mean = 1.95).

Conclusions: Ascending aortic aneurysm and elongation with incompetence of aortic valve can be treated successfully by replacement with a short graft, relocating the valve plane to normal position, and recreating a sinotubular junction.

OP43—ACUTE AORTIC TYPE-A DISSECTION: PRELIMINARY DATA ON 900 CASES AT A SINGLE INSTITUTION

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Background: Since acute type-A aortic dissection is associated with extremely high mortality this condition is now considered an emergency indication for surgery. At our institution no patients are excluded from immediate operation irrespective of age and preoperative status unless uncontrollable hemorrhage and/or cardiac arrest occur before reaching the operating room. In this preliminary study, part of a concise data analysis, early and late outcome following surgery was determined.

Methods: Between 1986 and 2010, 900 patients (616 men) with a mean age of 58.6 ± 11 (range 16-92) years underwent surgery for acute type-A aortic dissection. In 669 patients the ascending aorta was replaced with a prosthetic graft. In most cases this was combined with repair (eg, resuspension) of the aortic valve and in 35 patients the valve was replaced. In 231 patients aortic valve and ascending aorta composite replacement was applied. In most cases hypothermic circulatory arrest was induced to allow open inspection of the aortic arch and its repair when indicated.

Results: The 30-day mortality was 27% for all patients. It dropped significantly from 52% in the first 10 years to 18% in the last 10 years. Mortality was significantly influenced by patients' preoperative status. Among various risk factors, circulatory shock had the most impact (mortality with shock: 61% versus 21% in stable patients). In relation to age the early mortality differed significantly and was lower in patients under 50 years of age than in those over 70 years (19.7% versus 31%). The cumulative survival rate was 84.2%, 74.6%, 54%, and 26% at 1, 5, 10, and 20 years, respectively.

Conclusions: Emergency surgery for acute type-A dissection is associated with relatively high mortality which is influenced by institutional experience and patients' preoperative condition. No patient, however, should be excluded from operation when he or she can reach the operating room alive.

OP44—PREDICTORS OF OPERATIVE MORTALITY IN ACUTE AORTIC SYNDROMES

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Objective: Type A Acute Aortic Syndromes (T-A-AAS) have still high morbidity and mortality despite advances in management and therapy. Multiple clinical findings upon presentation, various lesion extension and low annual operative center/volume are elements that yield to difficult data evaluation. However, few studies have shown that some variables are predictors of poor operative outcome. We review our experience in the treatment of 200 consecutive surgical cases of T-A-AAS and analyzed the preoperative variables associated with operative mortality.

Methods: Several variables (180) have been collected related to demographic, anamnestic, clinical, and interventional characteristics at ER presentation, diagnosis establishment, and operative table. Those parameters have been correlated to operative mortality. The variables that diverged at initial univariate analysis ($P < .05$) become covariates in Cox regression model.

Results: From March 1993 to December 2010, 200 consecutive patients underwent surgery for T-A-AAS (acute aortic dissection = 182, intramural hematoma = 14, and penetrating ulcer = 4). Operative mortality was 28% (57 Pts). Main parameters associated with the operative mortality were: age ≥ 75 yrs ($P = .02$), previous cardiac surgery ($P = .01$), pulse deficit ($P = .02$), shock o cardiac tamponade at onset ($P = .01$), new cardiac tamponade at OR ($P = .03$), >36 h symptom/surgery interval ($P = .03$), and myocardial revascularization ($P = .04$). However, at multivariate analysis independent predictors for operative mortality were:

1. Shock o cardiac tamponade at onset (HR = 0.42; IC = 0.189-0.949; $P = .03$);
2. Pulse deficit at onset (HR = 0.504; IC = 0.254-1.000; $P = .05$); and
3. New cardiac tamponade at OR (HR = 0.453; IC = 0.204-1.008; $P = .05$).

Conclusions: Our data show that variables that express a severe hemodynamic impairment (shock or cardiac tamponade) or broad lesion extension of the vascular tree (pulse deficit) are independent predictors of operative mortality, rather that surgical strategy adopted.

OP45—TYPE A AORTIC DISSECTIONS IN YOUNG PATIENTS

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Objective: Aortic dissection in young individuals is infrequent. We present experience of surgical treatment of 77 such patients, who comprised 23.1% of all (295) dissecting aneurysms and who were operated upon during the same period of time.

Material and Method: Seventy-seven patients (62 [80.5%] males, 15 [19.5%] females), age ≤ 40 years old, were operated upon for the reason of acute or chronic aortic dissection, type A. Type I of dissection was observed in 43 patients, type II in 34 patients.

Results: Causes or factors that favoured dissections were: Marfan syndrome in 37 (48.1%), bicuspid aortic valve in 19 (24.7%), arterial hypertension in 13 (16.9%), cystic medianecrosis in 6 (7.8%), and unestablished reason in 2 (2.5%). Bentall's operation was fulfilled in 53 (68.9%), supracoronary grafting in 21 (27.3%). Besides that, in 10 (13.0%) patients (6 of them after Bentall procedure and 4 after supracoronary grafting) operations were supplemented by hemiarch (arch) correction. These operations were fulfilled with deep hypothermia and retrograde cerebral perfusion through the superior venae cavae. Hospital mortality comprised 10.4% (8 patients).

Causes of Death: Bleeding in 2 patients, acute renal failure in 4 patients, and myocardial infarction and pneumonia in 1 patient each. Remote results were studied in 67 (97.1%) of discharged patients in terms 6-120 months (mean 52.3 ± 6.1 months). Good remote results were noted in 50 (74.6%) patients, satisfactory in 9 (13.4%), unsatisfactory in 6 (9.0%); 2 (3.0%) patients died in the remote period.

OP46—LONG-TERM RESULTS OF TRANS-AORTIC STENT GRAFTING FOR DISTAL AORTIC ARCH ANEURYSM

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Objects: Before introduction of catheter endovascular stent-grafting, we performed the trans-aortic stent-grafting for distal aortic arch aneurysm. The purpose of this study to evaluate the long-term results and the feasibility of this method for true distal aortic arch aneurysm.

Methods: Forty-three patients (male/female: 35/8) with true distal aortic arch aneurysm were repaired with the stent-graft introduced through the incision on the proximal arch aorta under selective cerebral perfusion and circulatory arrest. The Gianturco Z-stent (diameter 40 mm, length 75 mm, Cook corp.) was sutured to woven Dacron graft distally, and introduced into descending thoracic aorta via hemicircular aortotomy on the proximal arch aorta under transesophageal echocardiography. The proximal end of the stent-graft was sutured intraluminally and transluminally in the arch aorta and the hemicircular aortotomy was closed by buttress suture with Dacron felt. The maximum distension of the excluded space was measured and evaluated to determine whether the aneurysmal space decreased or disappeared after this procedure. Long-term survival and complication were also evaluated.

Results: Patients' age ranged from 66 to 88 years old (mean 74 years old). Mean follow-up period was 8.7 years. There were 2 operative deaths (4.7%) by cerebral infarction and cardiac failure. Perioperative complications, such as endoleak (3/43; 7%), paraplegia (1/43; 2.3%) occurred during the initial period. Aneurysmal shrinkage was observed in every case except 2 cases with endoleak. Long-term survival could be achieved 78.1% at 5 years. Major causes of death were cerebral infarction (2), cardiac failure (3), and cancer (4). New aneurysms were observed in 4 paroxysmal aorta, 2 descending thoracic aneurysms, and 6 abdominal aortic aneurysms. However, there were no patients with late aneurysmal rupture of stent-grafting aneurysm. Late coronary intervention could be feasible through both brachial arteries in 3 patients.

Conclusion: Long-term results of trans-aortic stent grafting were acceptable. Perioperative complications occurred during the initial period.

OP47—THORACIC STENT IMPLANTATION AND CONVENTIONAL SURGICAL REPAIR AFTER PREVIOUS ABDOMINAL AORTIC ANEURYSM SURGERY

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Objectives: Patients with thoracic and thoracoabdominal aortic aneurysm (TAAA) repair after previous abdominal aortic aneurysm (AAA) surgery have a high risk for spinal cord ischemia and renal dysfunction. This study evaluates the morbidity and mortality after thoracic stent implantation and conventional descending aneurysm surgery in patients with prior AAA repair.

Methods: Retrospectively, 63 patients with previous AAA repair were identified. In 29 patients (24 male, mean age 71 years, range 58-84 years) thoracic endografts were implanted (8 emergency). In the surgical group we included 20 patients (17 male, mean age 69 years, range 53-82 years) with descending aortic replacement above the diaphragm comparable with the endovascular group. There were 10 emergency procedures.

Results: The mean time interval between prior AAA repair and subsequent thoracic procedure was 5.5 years (125 days to 17 years) for stent implantation and 5.7 years (16 days to 13 years) for surgical repair. Thoracic stent placement was successful in all patients. In 5 patients the left subclavian artery was occluded. The 30-day mortality was 6.8% (2/29 pts.) in the endovascular group and 15% (3/20 pts.) in the surgical group. The rate of postoperative neurological complications differed but without statistical significance (6.8% versus 15%), whereas the postoperative creatinine level and new onset renal failure requiring hemodialysis differed significantly between the groups (3.4% versus 30%).

Conclusions: Thoracic stent implantation in patients with thoracic and thoracoabdominal aneurysm after previous abdominal aortic aneurysm surgery can be performed successfully without

technical problems. In comparison to patients with conventional repair, those with endovascular stent implantation have a statistically significantly lower risk of renal failure. Although no statistical difference is present, the early outcome of endovascular stent-graft treatment appears to be better than that of conventional surgical repair, also in respect to neurological complications and mortality.

PASCaTS I

TUESDAY, JUNE 14, 2011, 09:20 – 10:55 H

OP48—SIMULTANEOUS SURGICAL AND TRANSCATHETER TREATMENT OF PATIENTS WITH COMPLEX AORTIC PATHOLOGY

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Objective: The aim of present work is to overview the experience in our center with hybrid management of high-risk patients with complex aortic pathology.

Methods: From 2003 to 2010 a total number of 12 patients, 11 male and 1 female, with average age 49 years (from 26 to 69 years), underwent hybrid management of complex aortic pathology.

The pathology was aortic dissection in 9 patients, aneurysm after aortic coarctation surgery in 2 patients, and coronary artery disease, combined with severe aortic stenosis, peripheral artery disease, and lead pipe aorta in 1 patient.

The procedures were as follows:

- Aorto-carotid bypass with consecutive endovascular stent-graft (EVSG) implantation in 5 patients;
- EVSG implantation after conventional surgery in 4 patients;
- Single-stage Bentall/De Bono procedure + EVSG implantation in 1 patient;
- Conventional surgery after EVSG implantation in 1 patient; and
- Transapical aortic valve replacement after OPCAB surgery in 1 patient.

Results: One patient died in the aorto-carotid bypass + EVSG group because of aortic rupture. Two patients died in the surgery + EVSG group because of aortic dissection complications, 1 from intestinal ischemia and 1 from bronchomalacia. One patient in the aorto-carotid bypass + EVSG group developed stroke. All other patients had uneventful recovery and were discharged home.

Conclusions: Our experience shows that transcatheter management in patients with complex aortic pathology is a reasonable approach for management with acceptable morbidity and mortality. We can say that hybrid management, including transcatheter and conventional surgery, could be claimed an optimal therapy for these high risk patients.

OP49—INTERMEDIATE-TERM RESULTS WITH CARDIAC SURGERY IN SUB SAHARAN AFRICA: THE NIGERIAN EXPERIENCE

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Objectives: Although cardiovascular disease is a major cause of death in Africa, cardiovascular surgery is non-existent in most countries. There is therefore a paucity of data on the influence of socioeconomic and cultural factors on patients' compliance abilities. We report intermediate-term results with heart surgery experience in Nigeria and the challenges facing its future development.

Methods: Fifty-three patients who underwent heart surgery between November 2004 and February 2009 were retrospectively reviewed. Thirty (56.6%) were females, and mean age was 24.8 years (range 4-50) .Thirty-one (58.5%) patients had acquired and 22 (41.5%) congenital heart disease. Data were entered in an Excel spreadsheet and transferred to an SAS file for statistical analysis. Survival was calculated by the actuarial Kaplan Meier.

Results: Ten ASD and 7 VSD were closed, 3 PDA were ligated, and 2 had Modified Blalock Tausig Shunts. Twenty-seven patients with valvular disease underwent heart valve replacement with mechanical valve in 92% and stented tissue valve in 8%. One had repair of heart wound, and 3 valve patients were deemed inoperable. Logistic EuroScore for valve patients was 5.4%, while observed overall operative mortality was 11.7% and morbidity 3.9%. Long-term complications were all valve related and occurred in child bearing age females. Five-year freedom from death was 82%, thromboembolism or hemorrhage 82%, and composite death, hemorrhage, and thromboembolism 65%.

Conclusions: The poor socioeconomic status and illiteracy found in most patients afflicted with rheumatic heart disease, coupled with the unreliability of reported INR results limits the ability for safe monitoring of chronic anticoagulation. With these limitations and the average life expectancy in sub Saharan Africa, bioprosthetic valves may offer the best chance for long-term complication free survival free complications.

OP50—USE OF BALLOON VALVOTOMY AS BRIDGE TO SURGERY FOR SEVERE MITRAL STENOSIS

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Background: Severe mitral stenosis is a significant heart valve disease in Kenya where rheumatic heart disease amongst children and young adults is still prevalent. Unavailability of facilities for open heart surgery, inability to afford the surgery, and late presentation with complications that increase surgical risk are common socio-economic determinants of outcome of this disease. This situation has necessitated case analysis of options for intervention in the individual cases. The author conducted a retrospective analysis of the indications for performing bridge to surgery by Percutaneous Balloon Mitral Valvotomy (PBMV) in patients with symptomatic severe mitral stenosis who do not have favourable characteristics for optimal outcome; the immediate and medium term outcomes were studied.

Methods: PBMV was performed in 122 patients with symptomatic severe mitral stenosis between 1999 and 2010. The initial evaluations showed that they did not have favourable characteristics for optimal outcomes. The age range was 9 to 56 years with mean age of 28 years, and the female to male ratio was 1.8:1. The vast majority of the cases of mitral stenosis were rheumatic in origin. Major reason for not having surgery was inability to afford it (69%). Other reasons for PBMV were classified as high risk for immediate surgery, and socio-economic problems such as that surgery was unavailable or unaffordable in the near future. The variations in preparations, the technical details of the procedure, immediate and follow-up results at 1 month, 3 months, 6 months, and 12 months were recorded and analyzed. The cohort for the follow-up was divided into 2 groups: patients who eventually received surgery and those who did not. Of the patients who did not receive surgery, reasons were recorded, and also outcomes of NYHA functional class, CV complications, and death. Of the patients who received surgery, the timing of surgery, and the results were recorded.

Results: The bridge PBMV procedures were successful in 93% of patients. During 1-year follow-up, 90% patients remained in NYHA functional class I-II, 6.6% developed stroke, 9% were re-admitted, 2 developed endocarditis, 1 developed rheumatic fever, and 9 (7.4%) died. A total of 54.9% patients managed to have surgery done, and 45.1% did not have surgery within the year (mainly because of inability to afford it). Of those who had surgery, all underwent mitral valve replacement. Hospital mortality was 6%. In 62.7% of the patients the postoperative course was uneventful. The total complication rate was 31.3%.

Conclusions: Late presentation of mitral stenosis with severe disease remains a significant problem in the management of mitral stenosis in Sub-Saharan Africa. This is further complicated by scarce facilities for cardiac surgery, cardiac intervention, and inability of patients to even afford these services when they are available. This scenario has created need for innovative approaches to improve survival and quality of life. A subset of patients with defined characteristics and indications for bridge PBMV procedure have emerged.

Ventricular Assist Devises

TUESDAY, JUNE 14, 2011, 09:20 – 11:00 H

OP51—VENTRICULAR ASSIST DEVICES PROGRAM IN FINLAND—TEN YEARS AFTER

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Objectives: To investigate an outcome and future prospects of the ventricular assist device (VAD) program in Finland.

Methods: VAD program based on Berlin Heart Excor paracorporeal pneumatically driven system started in Finland in the beginning of year 2000. A total of 26 patients have been treated for severe heart failure with an intention to bridge to transplantation.

Results: Overall 14 left ventricular assist devices (LVAD) and 12 biventricular assist devices (BiVAD) were implanted. 81% of patients were men and 19% were woman. The mean age of the patients was 46.4 years (range, 20.3-63.1 years). The indications for VAD were dilated cardiomyopathy in 31%, ischemic cardiomyopathy in 19%, recent myocardial infarction in 8%, myocarditis in 19%, postcardiotomy syndrome in 12%, Kawasaki disease in 4%, congenital heart disease in 4%, and postpartum cardiomyopathy in 4% of the patients. 31% of the patients underwent resternotomy due to postoperative bleeding, and 27% of the patients required transient renal replacement therapy postoperatively. The median duration of VAD treatment was 60 days (interquartile range, 17-154 days). Overall survival between the years 2000 and 2010 was 62%, and varied between the years 2000 and 2005 and 2006 and 2010 from 14% to 79%, respectively. 26% of the patients died during VAD treatment, 54% of the patients received heart transplant, 15% of the patients are still waiting for transplant, and in 4% of the patients VAD was regarded as destination therapy. Survival of the transplanted patients was 75%.

Conclusions: The future prospects of the VAD program in Finland are promising, and after an inevitable learning curve, the long-term results are acceptable. Berlin Heart Excor seems to be well applicable device for the heart failure patients who need VAD as bridge to transplant. Due to lack of donor organs in Finland, it seems likely that an increasing number of patients will require VAD before transplantation.

OP52—PREDICTION OF OUTCOME AFTER LEFT VENTRICULAR ASSIST DEVICE IMPLANTATION: RELEVANCE OF THE LIETZ SCORE FOR CONTINUOUS FLOW DEVICES

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Introduction: The Lietz score, implemented in 2007 for the prediction of post-implantation survival in destination therapy, was established in patients who received pulsatile LVADs only. In this study we investigated whether the Lietz score might also be valid for continuous flow (CF) devices.

Methods: One hundred eighty-eight patients (median age 56 years ± SD 11.6 [range 18-79], 162 men, 26 women) underwent primary CF LVAD implantation at our institution between Jan. 2008 and Oct. 2010. We implanted 80 HeartMate II devices, 29 Berlin Heart Incor, 6 DuraHeart, 4 Jarvik 2000, 66 HeartWare, 2 DeBakey, and 1 Ventrassist. The Lietz score of all patients was calculated retrospectively.

Results: The sensitivity and specificity for 30-day mortality (cut off > 16 points = low/medium risk group versus high/very high risk group) was 30% (95% CI 17-46) and 72% (95% CI 75-80), respectively. The area under the curve was 0.557 (95% CI 0.443-0.671).

The sensitivity and specificity for 90-day mortality was 25% (95% CI 15-37) and 76% (95% CI 73-80). The area under the curve was 0.569 (95% CI 0.476-0.663).

Sensitivity and specificity for 1-year mortality was 24% (95% CI 17-32) and 75% (95% CI 68-82). The area under the curve was 0.524 (95% CI 0.425-0.624).

Conclusion: In our recent CF LVAD patients, calculated Lietz score was not predictive. New risk scores for newer generations of non-pulsatile LVADs should therefore be established.

OP53—LEVITRONIX CENTRIMAG THIRD-GENERATION CONTINUOUS FLOW PUMP AS A BRIDGE TO DECISION FOR REFRACTORY CARDIOGENIC SHOCK

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Objectives: The Levitronix CentriMag (Levitronix LLC, Waltham, MA) ventricular assist device (VAD) is a magnetically levitated rotary pump designed for temporary extracorporeal support. The aim of this study is to report our early results with the device.

Methods: Between Feb. 2004 and Feb. 2011, 45 consecutive adult patients were supported with Levitronix at our institution (34 men; age 61.3 ± 11.5 years, range 31-76 years). Indications for support were (Group A, n = 40) failure to wean from the cardiopulmonary bypass in the setting of post-cardiotomy (n = 24), primary donor graft failure (n = 5), or right ventricular failure after axial LVAD placement (n = 11); and (Group B, n = 5) refractory heart failure after acute myocardial infarction.

Results: The mean support time was 11.3 ± 6.9 days (range 3 to 43 days) in Group A and 8.6 ± 4.3 days (range 5 to 11 days) in Group B.

In the post-cardiotomy cohort (Group A), 11 (45.8%) patients were weaned from support as were 4 supported graft failure patients. Nine patients of axial LVAD cohort were weaned from RVAD. One patient was bridged to heart transplantation (Htx). Fifteen (37.5%) patients died on support in Group A. In Group B, 1 patient was bridged to Htx, and 4 died on support.

In overall population bleeding requiring re-operation occurred in 15 (33.3%) cases and cerebral major events in 4 (8.8%). There were no device failures. Of the 24 (53.3%) patients who recovered and were discharged home, 21 (46.6%) are presently alive and well in addition to the 2 patients of both Groups who were bridged to Htx (overall n = 23, 51.1%).

Conclusions: Levitronix CentriMag proved to be effective as a bridge to decision in patients with refractory acute cardiogenic shock in several clinical scenarios. The device was technically easy to manage and the results were encouraging.

OP54—THE ROLE OF LEVITRONIX CENTRIMAG SYSTEM IN BRIDGING PATIENTS TO A LONG-TERM ASSIST DEVICE

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Introduction: At present, the most definitive therapeutic option for end-stage heart failure is cardiac transplantation. However, this method is in its availability due to a lack of available organs limited. This is why ventricular assist devices (VADs) capable of supporting the circulation are playing taking an increasingly important role in the management of heart failure therapy. The CentriMag (Levitronix LLC, Waltham, MA) system is a device for bridging patients to decision or directly to transplant. This study evaluates our clinical experience of temporary mechanical support in patients who were bridged to a long-term assist device or to heart transplantation.

Methods: A retrospective review was performed of 35 patients from March 2004 to January 2009 who were initially treated with Levitronix CentriMag system as bridge to decision or directly to transplantation. All patients had ultimately undergone an implantation of long-term assist device.

Results: The aetiology of heart failure was dilated cardiomyopathy in 28 patients, ischemic cardiomyopathy in 6 patients, and cardiogenic shock in 1 patient. Mean age was 37 ± 13.54 years (range, 13-59 years), and mean duration of CentriMag assistance was 33.88 ± 34.02 days (range 3-167 days) and was used as biventricular support (n = 10), left ventricular support (n = 6), and right ventricular support (n = 19). There was 1 mechanical device failure. All patients were upgraded to long-term devices: Jarvik = 6, HeartMate I = 5, and HeartMate II = 24. Mean duration of long-term support was 302.70 ± 220 days (range, 4-1380 days) and the long-term survival rate was 65%. Out of them, 10 patients were bridged to heart transplantation and 1-year mortality in these patients after heart transplantation was 7% (n = 1).

Conclusion: The Levitronix CentriMag has proven to be a versatile, safe, and effective short-term circulatory support for patients with end-stage heart failure as a bridge to decision or to heart transplantation.

OP55—TEMPORARY RIGHT VENTRICLE MECHANICAL SUPPORT FOLLOWING CENTRIFUGAL CONTINUOUS FLOW LVAD INSERTION—A NOVEL USE OF ECMO

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Introduction: Acute right ventricular (RV) failure may complicate the insertion of a left ventricular assist device (LVAD). With optimal medical therapy and "resting" of the right ventricle, it is possible to wean some patients from RV mechanical support. We review the technique of temporary right heart mechanical support using extracorporeal membrane oxygenator (ECMO) following insertion of third generation centrifugal continuous flow rotary pumps (VentrAssist and Heartware).

Methods: Data were collected retrospectively. From Jan. 2004 to May 2010 59 LVADs have been inserted; 11 patients required Venous-Pulmonary Artery (VPA) ECMO for RV failure (18%).

Results: All patients could not be weaned from cardiopulmonary bypass with satisfactory LVAD flows. All VPA ECMO circuits were inserted using the same technique. Venous drainage for V-PA ECMO was via a femoral vein cannula. Circuit outflow was through a percutaneous cannula secured to the main pulmonary artery. The circuit was removed without reopening the sternum. Average duration of RV support was 7.2 days, and mean length of stay in ICU was 23 days. Mean patient age was 35.8 years, and 8 patients were male. Eight patients were diagnosed with dilated cardiomyopathy, 1 with postpartum cardiomyopathy, 1 with ischemic cardiomyopathy, and 1 with postcardiac transplant acute allograft failure. All patients were weaned from VPA ECMO support. There were 2 deaths: 1 early perioperative death from multiorgan failure in the patient with acute allograft failure, the second from hypoxic brain injury following hemothorax on day 6. All other patients were discharged home to await their cardiac transplant. Two patients have been successfully transplanted.

Conclusion: Despite optimal medical right ventricular support some patients will require temporary mechanical assistance. These patients demonstrate recovery of RV function and can be weaned from ECMO support, showing sustained satisfactory RV function and maintaining appropriate LVAD flows.

OP56—A NEW CONCEPT TO ASSIST THE FAILING RIGHT VENTRICLE: BYPASSING RIGHT VENTRICLE AND PULMONARY CIRCULATION. AN EXPERIMENTAL STUDY

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Introduction: Surgical options to treat right ventricular failure (RVF) after cardiotomy are very limited. Conventional implantation of assist devices in RVF shows poor long-term results. We aimed for a new right ventricular assist system to minimize RV-afterload and overcome ventricular interdependence.

Methods: For the system we used a microaxial pump (Abiomed) and a low resistance Oxygenator (iLA, Novalung; Quadrox, Marquet) in a minimized circuit. Connection with the heart was right atrium (percutaneously) and the left atrium (small thoracotomy; direct left atrium: n = 6; transatrial: n = 4). The system was evaluated in 10 sheep (65 kg). For right ventricular failure we used adjustable pulmonary artery banding. For 1 hour the system worked without RVF. Then RVF was induced. The system was started after 5 minutes of RVF. After 2 hours (n = 6) respectively 6 hours (n = 4) the system was stopped again (untreated RVF). Complete hemodynamic monitoring was performed as well as echocardiography, flow measurement, and serial blood gas analysis.

Results: During the operation of the system without RVF no relevant changes of hemodynamics were detectable; blood gases were supra normal. The RVF was profound with a drop in mean arterial pressure (MAP) to 46 (± 9.1) mmHg, a massive rising of CVP and systolic pulmonary pressure, reduced aortic flow and tricuspid annular systolic velocity (TASV). Immediately after starting the system with a flow of 4.2 (± 0.3) L/min circulation normalized to a MAP of 76 (± 14.4) mmHg. Blood gas analyses were supranormal. After stopping the system the severe RVF returned.

Conclusion: This device effectively treats acute right ventricular failure by reducing right ventricular afterload and interrupting ventricular interdependence. We showed efficacy and feasibility of this assist system.

OP57—REVERSAL OF CHRONIC HEART FAILURE BY VENTRICULAR UNLOADING: DETECTION OF PATIENTS WITH THE POTENTIAL TO MAINTAIN CARDIAC STABILITY AFTER ASSIST DEVICE REMOVAL

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Background: Unloading-promoted reversal of heart failure (HF) allows long-term transplantation-free outcome after ventricular assist device (VAD) removal. However, because few patients with chronic cardiomyopathy (CCM) were weaned from VADs (the majority only recently), the reliability of criteria used for weaning decisions to predict long-term post-weaning success is barely known. After 16 years of weaning experience we assessed this issue.

Methods: In 50 patients with CCM as the underlying cause for HF, who were part of a total of 93 patients weaned from bridge-to-transplant designed VADs since 1995, we analyzed data on cardiac morphology and function collected before VAD implantation, echocardiographic parameters recorded during "off-pump" trials, duration of HF before implantation and stability of recovery before and early after VAD removal.

Results: Post-weaning 5-year freedom from HF recurrence reached 66%. Only 5 patients (10.6%) died due to HF recurrence or weaning-related complications. Pre-explantation "off-pump" LVEF of ≥50% and ≥45% revealed predictive values for cardiac stability lasting ≥5 years after VAD removal of 91.7% and 79.1%, respectively. With each unit of LVEF reduction, the risk of

HF recurrence became 1.5 times higher. The predictive value of LVEF ≥45% also became >90% if additional parameters like pre-explantation LV size and geometry, stability of unloading-induced cardiac improvement before VAD removal and HF duration before VAD implantation were also considered. Definite cut-off values for certain parameters (including tissue Doppler derived LV wall motion velocity) allowed formulation of weaning criteria with high predictability for post-weaning stability, also in patients with incomplete cardiac recovery.

Conclusions: VAD removal in CCM patients is feasible and can be successful even after incomplete cardiac recovery. Parameters of pre-explantation cardiac function, LV size and geometry, their stability during final "off-pump" trials and HF duration before LVAD implantation allow detection of patients with the potential to remain stable for >5 post-weaning years.

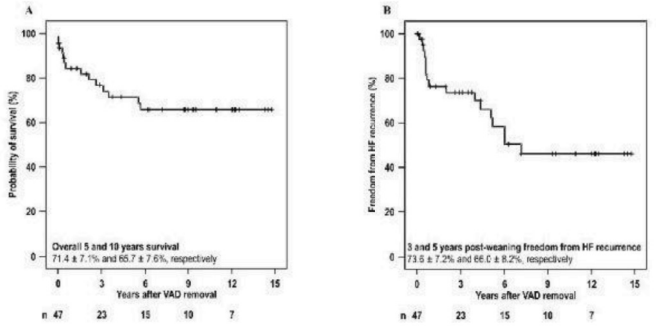

Figure 1. Kaplan-Meier estimates of patient survival after VAD removal with inclusion of post-transplant survival for patients with recurrence of HF (A) and of freedom from HF recurrence after VAD removal (B).

Figure 1

OP58—PERMANENT MECHANICAL CIRCULATORY SUPPORT IN NON-TRANSPLANT CANDIDATES

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Objectives: Facing the rapidly increasing population of older patients with end-stage heart failure, permanent mechanical circulatory support (MCS) has gained increasing importance. We analyzed the courses of 141 non-transplant candidates who were supported by 12 different mechanical circulatory support (MCS) devices.

Methods: Of the 141 patients, 24 had biventricular MCS devices (12 CardioWest, 8 Berlin-Heart Excor, 4 HeartWare biVAD) (7 INTERMACS I, 17 INTERMACS II-IV) and 117 left ventricular MCS devices (40 Berlin-Heart Incor, 19 DeBakey, 17 HeartMate II, 16 Berlin Heart Excor, 7 Novacor, 6 LionHeart, 5 Jarvik 2000, 4 DuraHeart, 3 HeartWare) (94 INTERMACS I-III, 23 INTERMACS IV-V), implanted between Jan. 1995 and Jul. 2010. Patients' mean age was 64 ± 9.5 (20-80) years.

Results: The mean time of support was nearly 1 year (341 ± 452 [1-1875] days). Fourteen patients (10%) were supported for more than 3 years. Sixteen patients (43%) could be discharged, with 2.9 rehospitalizations/patient/year. Reasons for readmission were coagulation disorder, wound infection, stroke, arrhythmia, and technical failure. In 5 patients a device exchange should be performed. Six patients received high-urgent heart transplantation, 21 are still receiving support, and 114 patients died during support.

Conclusions: Although the devices were implanted for permanent support, some patients needed high-urgent transplantation and/or device exchange. Nevertheless, the new non-pulsatile devices allow left- and biventricular support and offer good quality of life for several years.

Adult Cardiac Surgery IV

TUESDAY, JUNE 14, 2011, 11:20 – 12:50 H

OP59—LONG-TERM RESULTS OF MITRAL VALVE REPAIR IN OCTOGENARIANS

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Objective: The optimal strategy for the management of mitral regurgitation in octogenarians is still debated. Cardiac operations in elderly patients are increasingly frequent and imply major clinical and ethical issues. The aim of this study is to analyse the mitral valve procedure in this group of patients.

Methods: We retrospectively reviewed our experience between 2003 and 2009 in 46 patients, 27 women and 19 men, with chronic mitral regurgitation and New York Heart Association (NYHA) Class I/II. Twenty-four patients had concomitant coronary artery bypass grafting (CABG). Preoperative and postoperative echocardiography examination was done. Predicted operative mortality was evaluated with Euroscore. Mortality and life tables were studied. Parameters that affect survival were evaluated with Cox regression analysis. A *P* value less than .05 was considered statistical significant. Quality of life test was performed.

Results: Mean postoperative follow-up was 42 ± 10 months (range 1-52 months). Mean age was 84.82 ± 5.81 (80-88) years. The EF increased from 36.60% ± 11.21% to 43.92% ± 10.98%. Postoperative 9 patients suffered of low cardiac output syndrome. Hospital mortality was 6.52%. The 30-day survival was 91.30%, and the 12-, 24-, and 48-month survival was 86.95%, 80.44%, and 65.21%, respectively. Risk factors for early mortality were mitral valve repair with concomitant CABG, emergency, acute myocardial infarction, chronic lung disease, and depressed systolic function. Predictors for long-term mortality were age ($P < .001$), depressed systolic function, and lung disease.

Conclusion: Mitral valve repair with or without concomitant CABG can be performed with acceptable morbidity and mortality in patients aged 80 years or more. A proper selection of patients and the operative risk evaluation should be considered. Whenever

possible, nonelective operations should be avoided and earlier surgery should be encouraged.

OP60—MITRAL VALVE FUNCTION AFTER SURGICAL TREATMENT OF ISCHEMIC HEART FAILURE

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Objective: To evaluate the mitral valve (MV) function in patients with ischemic heart disease complicated with left ventricular (LV) dysfunction before and after surgery.

Methods: In this study we included 200 patients with ischemic heart failure who underwent surgical treatment. There were 178 men and 22 women, with a mean age 56 ± 8 years, who had one or more prior myocardium infarction, with 3-4 NYHA functional class, and EF less than 35%. Myocardial revascularization was performed in all patients. Indication for MV surgery was severe mitral regurgitation (MR) grade 3-4 in 32 patients. Mitral valve repair was performed in 28 patients and mitral valve replacement in 4 patients. Surgical correction of coronary and mitral incompetence combined with left ventricular reconstruction in 76 patients.

Results: Various grades of MR were found in 96% of patients with coronary artery disease and severe LV dysfunction, and 2-4 MR grades was in 50%. Overall hospital mortality was 5.5 %. The mean NYHA functional class decreased from 3.4 ± 0.6 to 2.1 ± 0.7 postoperatively. MV repair combined with myocardial revascularization or LV reconstruction resulted in significant decrease of MR grade from 2.4 ± 0.8 to 1.3 ± 0.7 postoperatively, but it progressed to 1.6 ± 0.7 in 1-year follow-up (P = .04). In patients with isolated CABG MR grade increased from 1.4 ± 0.6 to 1.6 ± 0.7 at 12 months after surgery (P = .9). In patients with LV reconstruction combined with coronary revascularization MR grade remained at preoperative levels (1.4 ± 0.6 preoperatively and 1.2 ± 0.6 in 12 months after surgery, P = .08).

Conclusions: In patients with severe LV dysfunction, coronary artery bypass grafting and LV reconstruction does not result in significant changes of ischemic MR.

OP61—MODIFIED GERBODE PLICATION PLASTY WITH STABILIZATION OF THE POSTERIOR ANNULUS BY UNTREATED AUTOLOGOUS PERICARDIUM FOR MITRAL VALVE REGURGITATION: 18-YEAR SINGLE-CENTER EXPERIENCE

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Objectives: The most common reason for mitral leaflet flail is chord rupture. This study evaluates early and long-term outcome and freedom from reoperation after mitral valve (MV) reconstruction for mitral leaflet flail using combined modified Gerbode plication plasty and Hetzer's technique.

Methods: Between June 1992 and October 2010, 184 patients (mean age 56.97 ± 14.78 years, range 5 to 86 years) with mitral leaflet flail were surgically treated. The MV repair technique was Gerbode plication plasty modified with pericardial strip stabilization of the posterior annulus (Hetzer's modification). Isolated MV disease was found in 69.02%. Echocardiograms were taken perioperatively and serially during follow-up.

Results: Thirty-day mortality was 1.63%, and 1-year mortality was 2.91%. Actuarial survival at 10 years was 81.8% and at 15 years 66.1%. Actuarial reoperation-free survival at 10 and 15 years was 85%. At 18 years, freedom from MV replacement was 89.9% ± 2.67%, and freedom from repeat reconstruction 94.5% ± 1.92%.

Conclusions: Mitral valve reconstruction for mitral leaflet flail using combined modified Gerbode plication plasty with Hetzer's technique provides satisfactory early and long-term survival and clinical outcome with low reoperation rates.

OP62—COST COMPARISON OF MITRAL VALVE REPAIR AND REPLACEMENT

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Introduction: The superiority of mitral valve (MV) repair over replacement is well established. Few data are available on the economic analysis of mitral procedure selection. The purpose of this study was to compare the costs of MV repair and replacement while taking into account a variety of hospital and patient level characteristics.

Methods: Nationwide Inpatient Sample (NIS) data (2005-2008) were used to compare costs of isolated mitral valve (MV) repair (ICD-9-CM code 35.12) and replacement (ICD-9-CM codes 35.23 and 35.24). The Centers for Medicare and Medicaid Services (CMS) hospital accounting reports were used to derive the cost to charge (CC) ratio. This ratio was used to convert total hospital billed charges to costs. The top and bottom deciles were excluded to address normality concerns and outliers. Patients < 30 years of age were excluded, while those with concomitant tricuspid repair or replacement were not. A linear mixed effects multivariate analysis was performed to assess costs as they relate to hospital and patient level characteristics.

Results: 17,308 MV repairs and 19,304 MV replacements were identified. The mean cost of MV repair was $33,141, while the mean cost of MV replacement was $46,549. Cost was significantly influenced by hospital region ($P \leq .001$), admission type (P = .0006), primary payer (P =.0001), length of stay ($P \leq .001$), age (P =.0275), gender (P = .0006), heart failure (P = .0002), endocarditis (P = .001), and various complications, such as renal failure, bleeding, septicemia, and wound dehiscence ($P < .05$). Following adjustment for all of the variables that had a significant association with cost, MV repair remained significantly less expensive compared to replacement ($30,551 versus $37,306, $P \leq .0001$).

Conclusions: Mitral valve replacement is associated with a significantly higher cost, even following adjustment for a variety of hospital and patient level characteristics. Efforts to increase repair rates could result in potential cost savings.

OP63—DIFFERENT TYPES OF ISCHEMIC MITRAL VALVE REGURGITATION: DO THESE INFLUENCE THE RESULTS OF ANNULOPLASTY?

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Objectives: The mitral valve repair results in different types of ischemic mitral regurgitation in addition to revascularisation and survival rates were the focus of our interest.

Methods: Combined CABG and mitral surgery for ischemic MR was performed on 170 consecutive patients (14 females, 156 males). Prospectively maintained patients undergoing MV reconstruction with different types of undersized rigid and flexible ring and band were divided on the basis of preoperative MV and LV assessment. According to MV abnormality 103 pts (60.4%) was in symmetric group (SG) and 67 in asymmetric one (ASG).

Results: 30-day mortality rate was 5.7%. 1-year survival was 94.1%. Before operation the end-diastolic (EDVi) and end-systolic (ESVi) LV volumes indexes, local and global contractility of LV, configuration and deformations of mitral valve were impaired significantly in SG comparing with ASG ($P < .05$). During follow-up we observed severe reduction of LV volumes only in SG, but they were still significantly larger than in ASG (EDVi 85.2 ± 25.1 versus 65.2 ± 17.8 mL/m^2; ESVi 53.2 ± 20.5 versus 33.6 ± 12.6 mL/m^2, $P < .05$). Despite this ASG patients have had more severe level of residual MR (1.21 ± 0.64 versus 0.87 ± 0.5, $P < .05$) and worse MV deformation (tenting area 1.87 ± 0.46 versus 1.5 ± 0.6 sm^2, $P < .05$). In ASG improvement in global contractility (LCi 1.39 ± 0.52 versus 1.46 ± 0.18, $P < .05$) observed without any changes on the level of posterior papillary muscle (LCi PPM 2.04 ± 0.51 versus 1.96 ± 0.18, $P < .05$).

Conclusions: Patients with asymmetric MV regurgitation are in increased risk of recurrence of MR on follow-up. Preoperative more severe mitral valve deformation and different involvement of the bases of anterior and posterior papillary muscles in LV remodeling were identified as the predictor of recurrence of IMR.

OP64—SURGICAL TREATMENT OF ISCHEMIC MITRAL REGURGITATION. A TEN-YEAR SINGLE CENTER EXPERIENCE

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Objectives: To evaluate a single center 10-year experience in surgical treatment of ischemic mitral regurgitation.

Methods: From Jan. 2000 until Jan. 2011, 129 patients underwent surgical treatment of ischemic mitral regurgitation. One hundred two patients (79%) were male. Average age was 64 ± 9 years (range 45-86). Average EF was 39 ± 11% (20-75). Median NYHA class was III. Average logES was 10.2 ± 9.4%. Nine patients (7%) underwent previous cardiac surgery. One hundred three patients (80%) underwent mitral valve repair (MVrep), and 26 patients (20%) underwent mitral valve replacement (MVR). Concomitant CABG was performed in all patients. Other concomitant procedures included tricuspid valve repair in 19 (15%), LV remodeling in 10 (8%), cardiac resynchronization in 4 (3%), and RFA in 4 (3%) patients.

Results: Seventeen patients (13%) died perioperatively. Median follow-up was 33 months (1-102). There were 22 (21%) late deaths. Eight patients were lost to follow-up. Actuarial survival for patients undergoing MVrep was 88%, 71%, and 61% at 1, 5, and 8 years, respectively. For patients undergoing MVR actuarial survival was 83%, 67%, and 67% at 1, 5, and 8 years, respectively ($P = .95$ versus MVrep). Median NYHA class at follow-up was I.

Conclusions: Surgical treatment of ischemic mitral regurgitation still has significant perioperative and late mortality. However, it does achieve a good functional result. There appears to be no advantage in survival according to choice of mitral procedure.

OP65—ADJUSTED DE VEGA TRICUSPID ANNULOPLASTY (ADVTA) GUIDED BY INTRAOPERATIVE TRANSESOPHAGEAL ECHOCARDIOGRAM (TEE)

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Functional tricuspid regurgitation (FTR) is an important dilemma in cardiac surgery, and tricuspid annular dilation is a reliable indicator of the degree of FTR. Many methods are available for repair: ring repair is believed to be more durable than suture annuloplasty, however the suture repair still holds a place. This work was conducted in 60 patients with history of rheumatic heart disease with predominance mitral valve diseases, pulmonary hypertension (PH) and FTR.

Group I: 30 patients had ADVTA using intraoperative TEE.

Group II: 30 patients had conventional De Vega tricuspid annuloplasty (CDVTA).

The 2 groups were assessed immediately and 6 months later by TTE.

There was a significant relation between PH and tricuspid valve annulus diameter (TVAD) in Group I (mean TVAD in PH grade 2 is 38.0 ± 6.5 mm, while in PH grade 3 mean TVAD is 41.1 ± 4.6). Also PH correlates significantly with TVAD in Group II. Results showed advantage of ADVTA in avoiding postoperative residual TR due to accurate application of tension (Preoperative FTR grade 2 in 12 patients and FTR grade 3 in 18 patients, immediate postoperative TR grade 2 in 4 patients and no patient in TR grade 3, late postoperative TR grade 2 in 6 patients and TR grade 3 in 1 patient). Results demonstrated superiority of ADVTA in decreasing postoperative diastolic gradient (PODG) on tricuspid valve and in avoiding tricuspid stenosis (immediate PODG in Group I is 5.4 ± 3.2 mmHg and 9.1 ± 3.3 mmHg in Group II, late PODG in Group I is 5.9 ± 3.3 mmHg and 9.9 ± 3.5 mmHg in Group II).

ADVTA guided by TEE still holds a place as it is quick, inexpensive, devoid of use of foreign body especially in the presence of infection, and showed durability.

General Thoracic Surgery II

TUESDAY, JUNE 14, 2011, 11:20 – 12:50 H

OP66—MODIFIED CLINICAL PATHWAY IN SEVERE FLAIL CHEST: A PRELIMINARY EXPERIENCE

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Background: Previous studies have demonstrated a linear relationship between the numbers of rib fractures and complications, including mortality. Patients with severe flail chest may benefit from operative repair both in short- and long-term outcomes. We instituted an aggressive clinical pathway to evaluate the effect of our implementation on morbidity and mortality.

Material and Methods: We prospectively considered a period of 8 months in which all patients affected by severe flail chest following a trauma were managed surgically. Outcomes parameters included the number of rib fractures, intrathoracic injuries, pulmonary complications, number of ventilators days, ICU length of stay, and hospital stay.

Results: A total of 19 patients underwent surgical repair of their flail chest. The average number of rib fractures was 9.3 (range 6-13). Associated lesions occurred in 8 patients. Comorbidities included cardiovascular disease (13 patients) and COPD (6 patients). An average of 5.8 clips were used on each patient (range 2-12); 3 titanium bars were used in 2 patients; 2 bars were used in 1 patient, and 1 bar was used in 4 cases. Twelve patients were ventilated less than 24 hours; in 7 cases prolonged ventilation was required (mean 9.2 days, range 2-26 days). ICU stay was 1.25 days (range 0-6 days) for the patients with short ventilation time; the prolonged ventilation patients remained in ICU for 14.4 days (2-35 days). Among the patients mechanically ventilated more than 24 hours, 5 were affected by COPD. Overall hospitalization duration was 16.5 days (3-48 days). Pneumonia occurred in 3 patients, ARDS in 1 case. These last 3 patients needed prolonged ventilation. Mortality was null.

Conclusion: Early surgical stabilization of flail chest is a feasible and safe technique. The report of our preliminary experience shows promising results. The clinical pathway of patients with severe flail chest should take into account the surgical stabilization.

OP67—ELASTOFIBROMA DORSI: PSEUDOTUMOR OF THE CHEST WALL

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Introduction: Elastofibroma is a benign soft tissue tumor of uncertain etiology. The tumor is always located in subscapular region between bones and muscle structures of the chest wall. Surgical treatment is necessary in symptomatic patients. We report the largest series of surgically treated elastofibroma dorsi.

Method: Twenty-two female and 2 male patients underwent surgical excision for 35 elastofibromas in the department of thoracic surgery. Mean age was 55.4 years (range 34-75 years). The patients operated under general anesthesia on prone position except 10 patients who underwent postero-lateral thoracotomy for miscellaneous pulmonary diseases. No patient underwent preoperative tissue diagnosis.

Results: Thorax CT was the most commonly used diagnostic method in elastofibroma. Ten patients were diagnosed by CT, 3 patients diagnosed by MRI, and 2 patients with ultrasonography. Back pain and swelling were the most common symptoms. Ten of the patients with elastofibromas were diagnosed incidentally during thoracotomies. Elastofibromas were on the right side in 5 patients (20%), on the left in 10 patients (40%), and bilateral in 10 patients (40%). Seroma was seen in 10 patients (40%). Postoperative chronic pain was present in 9 patients (36%). There was no relationship between being right-handed or left-handed and side of the lesion. Fifteen patients (60%) had a history of hand-knitting over 10 years.

Conclusion: Elastofibroma dorsi must be operated in case of pain or shoulder dysfunction. Otherwise, surgical complications or chronic postoperative pain may decrease the success of the surgical treatment. The specific site and radiologic findings are diagnostic for the tumor. Repetitive micro traumas may have a role in developing of this hyper proliferated fibro elastic tissue, however; genetic predisposition seems to be more effective in the formation of the tumor.

OP68—TIETZE'S SYNDROME: EVALUATION OF 165 CONSECUTIVE PATIENTS

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Objectives: Tietze's syndrome first described by Tietze in 1921, is a nonspecific, nonsuppurative costochondritis of unknown etiology manifested as pain and tenderness of the parasternal joints. Scattered reports of cases appeared in the literature in the last 90 year. This is the first reported instance of 165 cases occurring in a given group.

Methods: The 165 patients with Tietze's syndrome were seen at our thoracic surgery outpatient clinic and were retrospectively evaluated. Patient evaluation included a complete history, physical examination, chest X ray, evaluation for the clinical signs of costochondritis, and the months in which patients complaints start. The variables were evaluated with Pearson chi square test.

Results: The cohort study included 165 patients (age 38.6 ± 17 years). 80.6% of patients were women, whose ages ranged from 13 to 88 years. The most affected side is left (52.7%), and tenderness was localized to the costochondral junction of 3 ribs (40.6%), swelling was detected only at 10.9% of patients, and the forth rib is most affected one (46%). The 23% of patients were referred to the same thoracic surgeon after cardiologist's

evaluation for myocardial infarction by echocardiography and stress test. Patients with pain at 9.10.11 ribs were firstly evaluated by cardiologist ($P < .01$), and more of the cases occurred at March (17%).

Conclusion: Tietze's syndrome is characterized by the presence of a painful, tender swelling of one or more costochondral junctions, more commonly on the left side than the right. Although most cases of Tietze's syndrome had swelling, cases without swelling were also reported. In our series only in 10.9% of patients have had swelling.

The diagnoses of Tietze's syndrome relies on patient history and physical examination. The careful evaluation by physicians will reduce the cost effectiveness and will accelerate early initiation of therapy.

OP69—MINIMALLY INVASIVE REPAIR OF PECTUS CARINATUM: A SINGLE INSTITUTION EXPERIENCE

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Minimally invasive repair of pectus carinatum was defined by Abramson as a modification of the Nuss procedure, and it has been gaining support in the recent years. We have been performing minimally invasive repair of pectus carinatum in our institution since 2006. This prospective study describes our experience with our own bar and stabilizing system developed for the minimally invasive repair of pectus carinatum.

Following the first 3 cases being operated on placing regular excavatum bars presternally, we developed our own carinatum bar and stabilizing system in 2008. Between July 2008 and March 2011, 40 pectus carinatum patients between the ages of 10 and 28 years (median: 15) were operated on using this minimally invasive technique following the basic surgical principles described by Abramson.

One bar and 2 stabilizers were used in all patients for the correction of the deformity. The median operation duration was 60 minutes (range: 45-110), and the median duration of hospital stay was 4.5 days (range: 2-10). Excellent esthetic results obtained regarding the postoperative course, verified with the answers of the patients and parents on a satisfaction questionnaire; all patients except 2 (95%) feeling satisfied with surgical outcome. Six of the bars have been removed on planned time without any recurrence.

Minimally invasive repair of pectus carinatum placing a presternal bar can be preferred for the short operating time, low morbidity, and high levels of patient satisfaction.

OP70—SURGERY OF FUNNEL CHEST USING THE NUSS PROCEDURE. ANALYSIS OF DIFFICULTIES AND FAILURES

Kaminska, A.,[1] Rzechonek, A.,[1] Kolodziej, J.,[1] Mraz, M.[2]
[1]Medical University Wroclaw, Thoracic Surgery, Wrocław, Poland; [2]Academy of Physical Education, Wroclaw, Poland

Objective: Analysis of complications and difficulties in surgical treatment of funnel chest using the Nuss technique.

Material and methods: We analyzed 98 patients with funnel chest wall deformity underwent surgery during the period 01 Jan. 2002 to 31 Dec. 2010.

Mainly the patients were operated between the ages of 12 and 24 years. The average age of patients was 16.9 years. There were 81 male patients and 17 female (18%).

The most common method was setting up 1 implant in the areas of a largest sternal depression in 93 patients.

Rarely were used 2 implants (in 2 patients), or additional techniques for improving the cosmetic effect (in 3 patients).

Results: In 2 cases, by assumptions of inserting 2 implants in close proximity, occurred an intraoperative instability of them. In the early postoperative period, 1 case of tension pneumothorax was observed; in the second case, wound infection.

The late complications are 3 cases recurrence of deformity, 1 case of infection, and 1 case of an intercostal neuralgia. In 1 case an unsatisfactory cosmetic result was obtained. Total number of complications and failures was 9 (9.2%).

Conclusions: The decrease in incidence of complications is influenced by hemostasis and aseptic, stabilization of the implant and the extent and nature of deformation.

Heart Lung Failure I

TUESDAY, JUNE 14, 2011, 11:30 – 13:10 H

OP71—IMMUNOADSORPTION IN PATIENTS WITH DILATED CARDIOMYOPATHY: BRIDGE TO TRANSPLANT THERAPY AND POSSIBLE ALTERNATIVE TO HEART TRANSPLANTATION

Dandel, M.,[1] Wallukat, G.,[2] Englert, A.,[1] Lehmkuhl, H.B.,[1] Knosalla, C.,[1] Siniawski, H.,[1] Hetzer, R.[1]
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Background: Prolongation of waiting times for heart transplantation (HTx) increases the need for new therapies. In short-term follow-up studies, immunoadsorbtion (IA) appeared beneficial in dilated cardiomyopathy (DCM) associated with β1-adrenoreceptor-autoantibodies (β1-AABs). In HTx candidates with DCM we assessed the long-term results of IA, patients' responsiveness to IA, and the impact of selectivity of β1-AAB removal.

Methods: We evaluated all HTx candidates with DCM (β1-AAB-positive and β1-AAB-negative patients) who underwent IA from 1995–2005 (follow-up 5-15 years). As controls we used all β1-AAB-positive DCM patients referred for HTx during the same time period who received no IA therapy. We also looked for differences between unselective (unspecific IA) and selective (specific IA) β1-AAB removal. Main outcome measures were cardiac function and patients' survival without HTx or ventricular assist-devices (VADs).

Results: The 108 β1-AAB-positive patients who underwent

unspecific IA showed higher HTx/VAD-free survival than the 55 β1-AAB-positive patients without IA (control-group) and 19 β1-AAB-negative patients who also underwent unspecific IA (83.1 ± 8.6%, 25.5 ± 11.4%, and 47.4 ± 11.5%, respectively; *P* < .05). During the first 3 post-IA years the β1-AABs were redetected in 16 patients (14.8%). Reappearance of β1-AABs coincided with cardiac worsening. Unspecific and specific IA showed the same efficiency in β1-AAB removal (serum levels decrease with 87.4 ± 12.8% and 82.0 ± 19.3%, respectively). LVEF and NYHA-class improved after both (*P* < .01), but there were no differences in improvement after specific or unspecific IA. The probability for 5-year HTx/VAD-free survival in β1-AAB-positive patients reached 83.1 ± 8.6% for unspecific and 91.3 ± 5.9% for specific IA (*P* > .05). The prevalence of responders to specific and unspecific IA was similar (78.3% versus 79.6%).

Conclusions: Removal of β1-AABs by specific or unspecific IA improves cardiac function and allows long-term stability in end-stage DCM, which can spare many patients from HTx or will delay HTx listing for many years. Patients with high β1-AAB levels (≥3LU) showed more benefit from IA than those with low β1-AAB levels (< 3LU).

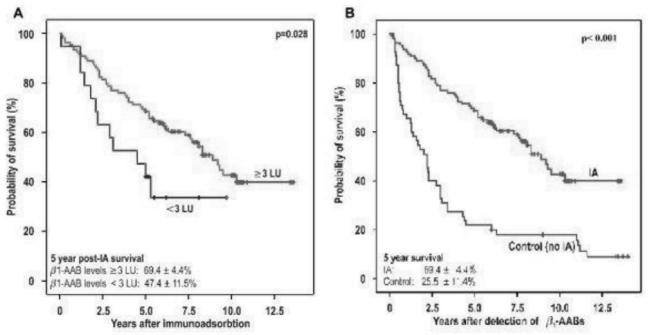

Figure 1. Kaplan-Meier estimates of HTx/VAD-free survival for DCM patients.
(A) HTx/VAD-free survival after unspecific immunoadsorbtion (IA): Comparison between patients with "high levels" (≥ 3 LU) and "low levels" (< 3 LU) of serum β1-AABs).
(B) HTx/VAD-free survival of β1-AAB positive patients (β1-AAB levels≥ 3 LU) after antibody detection. Comparison between patients with and without IA therapy.

Figure 1

OP72—ANTIBODY-MEDIATED REJECTION IS ASSOCIATED WITH MICROVASCULOPATHY AFTER HEART TRANSPLANTATION

Hiemann, N.E.,[1] Wellnhofer, E.,[2] Kretschmer, S.,[1] Christan, C.,[1] Lehmkuhl, H.,[1] Knosalla, C.,[1] Hetzer, R.,[1] Meyer, R.[1]
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Purpose: Antibody-mediated rejection (AMR) and microvasculopathy are associated with poor survival after heart transplantation (HTx). We tested the effect of AMR on the development of microvasculopathy (MVP) in biopsy.

Methods: We prospectively studied 134 patients who underwent endomyocardial biopsy at 4 weeks (n = 134), 1 year (n = 107), and 3 years (n = 61) after HTx. Acute cellular rejection (ACR; ISHLT), MVP (ratio of luminal radius to diameter of vessel wall), and endothelial swelling were evaluated in H&E stainings. AMR was assessed by immunohistochemistry (CD31-positive capillaries to CD68 and C4d; all x200).

Results: At 4 weeks, 1 year, and 3 years, MVP affected 36%, 48%, and 43% of patients, and AMR was present in 37%, 8%, and 10% of patients, respectively. Patients with AMR more frequently presented with MVP at 4 weeks (47% versus 22%; *P* = .010), 1 year (74% versus 46%; *P* = .006), and 3 years after HTx (81% versus 45%; *P* = .013). AMR was significantly correlated to ACR, eg, at 4 weeks 43% (*P* < .001), 1 year 50% (*P* = .006), and 3 years 17% of patients (*P* = .058) presented with concurrent ACR. However, only patients with MVP at 3 years post-transplant presented more often preceding ACR of any grade at 4 weeks after HTx (29% versus 5%; *P* = .025). Otherwise ACR was not correlated to MVP. Endothelial swelling was significantly correlated to concurrent MVP at 4 weeks (74% versus 33%; *P* < .001) and 1 year (61% versus 32%; *P* = .001) and also to future development of MVP at 3 years post-transplant (62% versus 32%; *P* = .009; 52% versus 32%; *P* = .066). Only at 1 year post-transplant was endothelial swelling correlated to AMR (100% versus 45%; *P* = .002).

Conclusions: AMR is associated with microvasculopathy after HTx in the early, mid-, and long-term follow-up. Microvasculopathy in biopsy should trigger screening for AMR and additional biopsy follow-up to identify high-risk patients.

OP73—USEFULNESS OF ECHOCARDIOGRAPHIC MYOCARDIAL DEFORMATION ANALYSIS BY STRAIN IMAGING FOR DETECTION OF PATIENTS WITH CORONARY STENOSES AFTER HEART TRANSPLANTATION

Pang, C.H.,[1] Dandel, M.,[1] Wellnhofer, E.,[2] Knosalla, C.,[1] Hetzer, R.[1]
[1]Deutsches Herzzentrum Berlin, Department of Cardiothoracic and Vascular Surgery, Berlin, Germany; [2]Deutsches Herzzentrum Berlin, Department of Cardiology, Berlin, Germany

Background: Non-invasive detection of cardiac allograft vasculopathy (CAV) for timing of angiographies is a major goal. However, because diffuse distal coronary narrowing is a major determinant of left ventricular (LV) dysfunction in CAV, wall motion alterations induced by coronary stenoses are less evident. Echocardiographic (ECHO) speckle-tracking–derived 2D-strain imaging reveals alterations in wall motion and myocardial deformation not detectable by conventional ECHO and allows distinction between active and passive wall motion. We assessed its reliability in distinguishing between patients with and without CAV.

Methods: LV radial, circumferential, and longitudinal strain and strain-rate (Sr) were calculated from parasternal and apical ECHO views obtained from heart transplant recipients before routine coronary angiography. Ayssynchrony and dyssynergy indexes were calculated in all patients from strain curves. Strain and Sr parameters and indexes were tested for relationships to angiographic findings.

Results: Of 187 evaluated patients, 56 had no angiographic CAV (group 1), 87 diffuse distal coronary type-B lesions (group 2), and 44 proximal focal stenoses (group 3). Whereas conventional ECHO parameters showed no predictive value for coronary stenoses, different strain and strain-rate parameters and indexes appeared highly predictive for detection of patients with CAV (Figure 1). Thus, the time to peak longitudinal strain-rate (TplSr)

and the peak longitudinal strain-rate/TplSr index showed up to 93.1% and 94.6% sensitivity and specificity, respectively, for differentiation between groups 1 and 2. The ayssynchrony and dyssynergy indexes for longitudinal shortening also allowed differentiation between group 2 and 3 (sensitivity and specificity: up to 86.3% and 74.4%, respectively).

Conclusions: 2D-strain imaging is reliable for CAV prediction and for differentiation between patients with and without focal coronary stenoses. The high predictive values of systolic strain dyssynchrony and dyssynergy indexes recommend 2D-strain as a non-invasive tool with the potential to facilitate early detection of stenoses and to enable angiographies to be timed, sparing patients frequent routine angiographies.

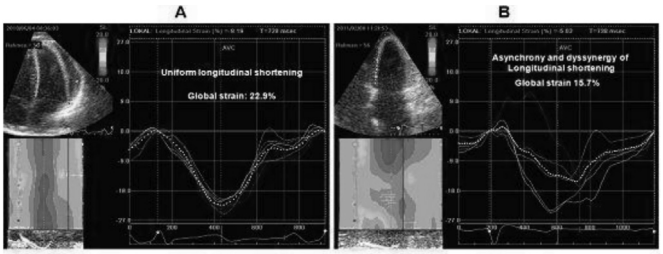

Figure 1 Speckle tracking derived 2D Strain images (longitudinal strain) in 2 different heart transplant recepicients with normal left ventricular ejection fraction (LVEF)

A. Patient without coronary artery disease (LVEF 65%).

B. Patient with focal coronary stenoses (LVEF 65%): LAD proximal 75%. RCx proximal 90%. RCA distal 75%

Figure 1

OP74—PREDICTION OF SHORT-TERM IRREVERSIBLE CARDIAC WORSENING IN APPARENTLY STABLE TRANSPLANT CANDIDATES WITH DILATED CARDIOMYOPATHY

Dandel, M., Knosalla, C., Lehmkuhl, H., Potapov, E., Siniawski, H., Krabatsch, T., Hetzer, R.

Deutsches Herzzentrum Berlin, Cardiothoracic and Vascular Surgery, Berlin, Germany

Background: Identification of patients with the greatest need for heart transplantation (HTx), anticipation of short-term cardiac worsening, and finding predictors of outcome without HTx or ventricular assist devices (VADs) are major goals that are becoming an increasing challenge with prolongation of waiting times on HTx lists. We assessed this issue in patients with idiopathic dilated cardiomyopathy (IDCM) referred for HTx.

Methods: In 70 consecutive clinically stable IDCM patients with LVEF < 30% and NYHA-class ≤III at the time of inclusion in the study we performed exercise testing and echocardiography including 2D-strain imaging and measured NT-ProBNP plasma levels. Parameters and indexes obtained were tested for predictability of further clinical course of heart failure (HF) during the next 6 months.

Results: During the first 6 months after inclusion in the study, 32 patients (45.7%) showed severe cardiac deterioration (9 died, 4 underwent HTx, 19 received a VAD). Comparing the parameters obtained from these patients at inclusion in the study with those obtained initially from the other 38 patients who remained stable, we found no differences in left ventricular end diastolic volume or ejection fraction (LVEF 22 ± 4% versus 20 ± 5%), and no differences in exercise tolerance (including VO2 max). However, patients with rapid clinical worsening had initially more altered transmitral flow profiles (higher E/A-wave ratios, shorter E-wave deceleration time) and higher NT-ProBNP plasma-levels ($P < .05$). Two-dimensional strain imaging revealed higher systolic dyssynchrony (circumferential and longitudinal) and higher longitudinal diastolic Em/Am strain-rate ratios ($P < .05$). At certain cut-off values, the E/A-wave ratio, the 2D-strain derived circumferential dyssynchrony index and the late diastolic strain-rate (Am) showed predictive values of between 80% and 90% for cardiac stability.

Conclusions: In clinically stable HTx candidates with IDCM, the transmitral flow profile and certain 2D-strain parameters are predictive for the short-term (6 month) course of HF and therefore helpful in HTx listing procedures.

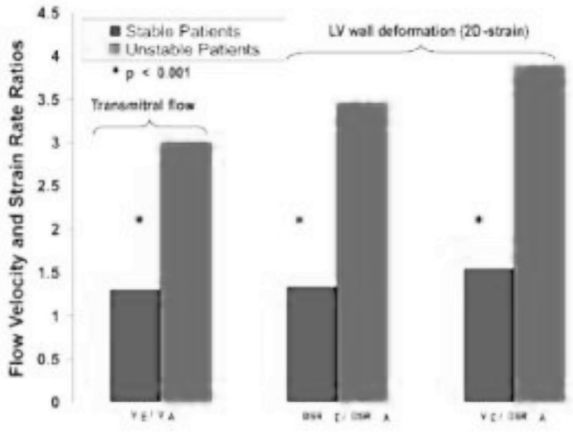

Figure 1. Transmitral flow and longitudinal deformation velocity ratios in HTx candidates with IDCM at the time of inclusion into the study. Patients with rapid deterioration of cardiac function had initially more altered diastolic function (reduced LV compliance).

Figure 1

OP76—EXPERIENCE WITH THE ORGAN CARE SYSTEM: HEART TRANSPLANTATION WITH EXTENDED DONOR CRITERIA

Yeter, R., Huebler, M., Pasic, M., Liedtke, C., Dandel, M., Lehmkuhl, H., Hetzer, R., Knosalla, C.

Deutsches Herzzentrum Berlin, Berlin, Germany

Purpose: The Organ Care System (OCS) is a portable organ perfusion and monitoring system intended to maintain donor hearts in a near-physiological and functioning state ex-vivo for transplantation.

We report our current experience with the OCS in cases of extended organ transportation time and marginal donor hearts.

Methods and Materials: Since January 2009, 21 donor hearts have been maintained on OCS. Six hearts were offered primarily, 8 as competitive rescue allocation, and 13 hearts were previously

declined by 1 to 7 (median, 4) other centers. Three hearts came from countries outside the Eurotransplant area. Donor age ranged from 17 to 70 years (median, 49). Twelve recipients were bridged to transplantation by mechanical circulatory support (LVAD n = 7, BVAD n = 3, TAH n = 2). Early graft function was assessed by hemodynamics and daily echocardiography.

Results: The median time hearts spent ex-vivo was 388 minutes (range 254-502), of which 68 (range 55-88) minutes were median total cold ischemia time and 320 (range 199-414) minutes represented oxygenated warm blood perfusion. All hearts were successfully transplanted, with excellent graft function. Two patients died for cardiac-related reasons 4 and 249 days after transplantation, resulting in a freedom from cardiac-related death of 87% at 2 years, respectively.

Conclusion: The OCS keeps hearts from an extended donor pool and with extended organ transportation time in healthy condition, resulting in excellent primary graft function.

The system has the potential to improve donor organ availability and transplantation outcomes.

Adult Cardiac Surgery V

TUESDAY, JUNE 14, 2011, 16:40 – 17:50 H

OP77—IS THE ROSS PROCEDURE SUPERIOR TO BIOLOGICAL AORTIC HEART VALVE REPLACEMENT IN YOUNG PATIENTS?

Richardt, D.,[1] Charitos, E.I.,[1] Stierle, U.,[1] Weimar, T.,[2] Hemmer, W.,[2] Sievers, H.H.[1]

[1]University of Luebeck, Department of Cardiac and Thoracic Vascular Surgery, Luebeck, Germany; [2]Sana Herzchirurgische Klinik Stuttgart GmbH, Stuttgart, Germany

Background: Long-term outcome in patients after the Ross operation is becoming more and more an important determinant for the judgement of this technique. Especially the question about the freedom from reoperation compared to a bioprosthesis in younger patients is discussed. We analysed follow-up data in the Ross procedure and aortic valve replacement using a bioprosthesis.

Methods: 1180 patients (mean age 43.05 ± 13.46 years, range 1.46-70.52 years, 896 male) with a mean follow-up of 7.42 ± 4.06 years after Ros procedure (subcoronary n = 573; reinforced full root n = 607) were evaluated. The data of Fann et al and Tanaka et al after aortic valve replacement with a bioprosthesis provided the basis of the comparison. Endpoint of this study was freedom of reoperation after 12 years of follow-up dependent on the age at the primary operation. Stratification according to age in years was as follows:

I < 16,
II 16-30,
III 31-40,
IV 41-50,
V 51-60,
VI 61-70

Results: Freedom from reoperation (%) after 12 years of follow-up depending on age at operation for Ross/Bioprosthesis Fann[1]/ Bioprosthesis Tanaka[1] was:

I 74/–/0;
II 87/28/50;
III 91/39/60;
IV 83/57/51;
V 92/65/61;
VI 82/74/–

(Ross reoperation means autograft and/or homograft redo.)

Conclusions: Long-term follow-up data revealed a benefit in the Ross procedure with an essential lower valve related reoperation rate especially in younger age compared to patients with bioprosthetic aortic valve replacement.

[1]Tanaka H, et al. The fate of bioprostheses in middle-aged patients: the Japanese experience. *J Heart Valve Dis.* 2010;19(5):561-567.

Fann JI, et al. Are the indications for tissue valves different in 2001 and how do we communicate these changes to our cardiology colleagues? *Curr Opin Cardiol.* 2001 Mar;16(2):126-35.

OP78—AORTIC VALVE RECONSTRUCTION OF THE BICUSPID AORTIC VALVE WITH ASCENDING AORTIC DILATATION BY TRICUSPIDIZATION USING AUTOLOGOUS PERICARDIUM

Kanki, K.,[1,2] Kawase, I.,[1] Yamashita, H.,[1] Uchida, S.,[1] Nozawa, Y.,[1] Matsuyama, T.,[1] Takatoh, M.,[1] Hagiwara, S.,[1] Ozaki, S.[1]

[1]Toho University Ohashi Medical Center, Cardiovascular Surgery, Tokyo, Japan; [2]Shin-Sapporo Hospital of Cardiology, Cardiovascular Surgery, Sapporo, Japan

Objectives: Bicuspid aortic valve often develops aortic valve stenosis or regurgitation and ascending aortic dilatation. We introduce a new reconstructive technique for the stenotic and regurgitant bicuspid valve by creating 3 cusps with glutaraldehyde treated autologous pericardium. Surgical results of bicuspid valve with dilated ascending aorta are reviewed.

Methods: From September 2007 through July 2010, we performed 60 cases of original aortic valve reconstruction using glutaraldehyde-treated autologous pericardium for bicuspid aortic valve. Among them ascending with or without hemi-arch replacement was performed for 19 patients. Mean age of the patients was 63.7 ± 10.0 years. Fifteen patients had aortic stenosis (AS), and 4 had aortic regurgitation (AR). Our original aortic valve reconstructive technique had been presented at the annual meeting of the European Association for Cardio-Thoracic Surgery in 2009 and 2010. A new commissure is created at the higher point along with raphe as the same level with 2 normally existing commissures, and 3 leaflets are reconstructed independently with separate measurement of length between each commissures. Concomitant procedures included 2 mitral valve replacements with Maze procedure and 1 Maze procedure.

Results: No early mortality or major morbidity was recorded. Postoperative echocardiography showed no or trivial AR. AR worsening had not been observed in 2 years. Postoperative mean peak pressure gradient through the newly reconstructed valve at

1 week, 1 year, and 2 years were 16.0 ± 11.0 mmHg, 10.3 ± 5.3 mmHg, and 10.3 ± 0.6 mmHg, respectively. No re-operation or additional intervention has been necessary.

Conclusions: Both stenotic and regurgitant bicuspid aortic valves with aortic dilatation could be manufactured nicely by our original aortic valve reconstructive technique. We continue to study long-term results.

OP79—EARLY RESULTS OF COMPREHENSIVE AORTIC ROOT AND VALVE REPAIR PROCEDURE

Song, M.-G.,[1] Chung, J.W.,[1] Shin, J.K.,[1] Chee, H.K.,[1] Kim, J.S.,[1] Kim, Y.I.[2]
[1]Konkuk University Medical Center, Thoracic and Cardiovascular Surgery, Seoul, Republic of Korea; [2]Inje University Seoul Paik Hospital, Thoracic and Cardiovascular Surgery, Seoul, Republic of Korea

Objective: To assess the efficacy, safety, and short-term durability of a new procedure we termed comprehensive aortic root and valve repair procedure (CARVAR), performed over the past 3 years in patients with aortic root and valve disease.

Methods: From October 2007 to December 2010, a total of 498 patients underwent CARVAR procedure in which the 3 main components of the aortic root, sinotubular junction (STJ), annulus and leaflet, and various aortic root wall diseases were addressed. Stanford type A aortic dissection patients were excluded from this study. For leaflet disease, bovine pericardial leaflets tailored over a specially constructed template were implanted, and the STJ and annulus were reduced by implanting specially customized artificial rings and strips, respectively. The patients were divided into 3 groups according to type of pathology: aortic root wall diseases group, which included annuloaortic ectasia and ascending aortic aneurysm (AAR n = 48); aortic regurgitation (AR) with leaflet disorder group (IAR n = 187); and aortic stenosis group (IAS n = 263).

Results: The mean age was 53.4 ± 12.5 years (range 12 to 84). There were 4 hospital deaths and 5 late deaths. There were 2 re-operations for AR recurrence. Additional procedures after the first operation included 3 CABG and 1 PCI due to coronary stenosis. The mean aortic sinus diameter was reduced from 54.2 ± 8.6 mm to 37.6 ± 4.5 mm ($P < .05$) in the AAR group, the mean AR grade was decreased from 3.0 ± 0.8 to 0.2 ± 0.4 ($P < .05$) in IAR group, and the max/mean pressure gradient decreased from 63.9 ± 36.9/39.1 ± 22.6 mmHg to 20.8 ± 10.9/11.0 ± 6.9 mmHg ($P < .05$) in IAS group.

Conclusions: The CARVAR procedure showed favorable early results on various aortic root wall and valve diseases.

OP80—SINGLE CENTER EXPERIENCE WITH 545 SUBCORONARY ROSS PROCEDURES

Charitos, E.I., Hanke, T., Stierle, U., Sievers, H.-H.
University of Luebeck, Cardiac and Thoracic Vascular Surgery Clinic, Luebeck, Germany

The aim of the present study was to evaluate our results with the subcoronary Ross procedure in young adults requiring aortic valve replacement.

Methods: 545 patients (mean age 42.7 ± 12.1, range 13.8-70.5 years, 412 male) underwent a Ross procedure at our institution between 1993 and 2010. Mean follow-up was 6.9 ± 3.9 years (3715 patient-years, range 0.1-16 y).

Results: Completeness of follow-up was 98%. Two early postoperative deaths and 25 late deaths were observed (cardiac valvular = 6, cardiac non-valvular = 3, non-cardiac = 16). Overall survival was 96.9% at 5 years and 94.7% at 10 years. Eighteen autograft and 18 homograft reoperations were observed in 18 and 14 patients, respectively. Freedom from autograft reoperation was 98.4% at 5 years and 95.4% at 10 years. Freedom from homograft reoperation was 98.4% at 5 years and 97.0% at 10 years. Seventeen late (>30 days) neurological events (LOR: 0.46%/patient-years), 9 major bleeding events (LOR: 0.24%/patient-years), and 20 events of late infective endocarditis conservatively managed (LOR: 0.54%/patient-years) were observed. The survival of the Ross patients did not differ from that of the normal population.

Conclusion: For the time period of this study, the subcoronary Ross procedure results in excellent patient survival and low incidence of reoperations and major cardiac and cerebrovascular events.

OP81—AORTIC ROOT RECONSTRUCTIVE SURGERY—NEW CREATED TECHNIQUE

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PZU Filip Vtori, Skopje, the Former Yugoslav Republic of Macedonia

Background: The native aortic valve can be explained with rules of the equal side triangle, and as a part of the aortic root it is wedged between the heart and the ascending aorta. Beside different types of aortic valve replacements, reconstructive techniques are increasingly performed to restore normal aortic valve function. Reconstructive techniques themselves can be divided into isolated reconstruction of aortic valve/root structures and the isolated replacement of one or more structures

With this study we evaluated clinical results of reconstructive surgery of the aortic root with 3 leaflets pericardial patch.

Methods: We created this reconstructive technique using bovine/equine pericardium, replacing valve cusps on aortic fibrous ring of patient. The leaflets are made from same pericardium from which other biologic valve prosthesis are done. The ring of patient's aorta was used as guide for sizing this valve. Leaflets are implanted separately, using continuous sutures with 2 supported stitches at newly created commisurae, without a stent or sowing ring. Patients with aortic valvular stenosis have been included. Excluding criteria was aortic anuly ring dilatation. Intraoperative and postoperative TEE was performed for every created valve.

Results: One hundred fifteen patients with aortic valvular disease had been included in study. Ninety-four of them got bovine and 21 equine pericardium created leaflets. Middle aorta cross clamping time was 71.94 minutes, and bypass time was 112.33 minutes. Four patients got an aortocoronary bypass in combination (2.3 grafts per patient). One patient developed middle aortic regitation. Mortality rate was 9.5% (4 patient). Follow-up period 1-108 months.

Conclusions: Aortic root reconstructive surgery ensures hemodynamic improvement with a small transvalvular gradient in patients. It can be implanted even in patients with small root or with bicuspid valve, with good clinical outcome.

Basic Science I

TUESDAY, JUNE 14, 2011, 16:40 – 18:00 H

OP82—REMOTE PRECONDITIONING IN NORMAL AND HYPERTROPHIC RAT HEARTS

Voucharas, C.,[1] Tagarakis, G.,[1] Lazou, A.,[2] Triposkiadis, F.,[1] Tsilimingas, N.[1]

[1]University of Thessaly, Larissa, Greece; [2]Aristotle University, Thessaloniki, Greece

Objectives: Moderate cardiac hypertrophy is a common state of many physiological and pathological conditions in humans: exercise, pregnancy, hypertension, heart valve disease, or myocardial infarction. Remote preconditioning (RPC) of the heart regarding transient ischemia caused to another organ or tissue far from the heart has the advantage that it does not compromise the myocardium. Proof of whether RPC to hypertrophic myocardium (HM) sustained ischemia is beneficial is of great interest in both laboratory investigations and clinical practice. The aim of our study was to investigate whether RPC improves myocardial function after ischemia/reperfusion injury in both normal and hypertrophic isolated rat hearts. This is the first time in world literature that cardioprotection by RPC in HM is investigated.

Methods: Four groups of 7 male Wistar rats each, were used: normal control, normal preconditioned, hypertrophic control, and hypertrophic preconditioned groups. Moderate cardiac hypertrophy was induced by fludrocortisone acetate and salt administration for 30 days. Remote preconditioning of the rat heart was achieved by 20 minutes of transient right hind limb ischemia and 10 minutes of reperfusion of the anaesthetized animal. Isolated Langendorff-perfused animal hearts were then subjected to 30 minutes of global ischemia and reperfusion for 60 minutes. Contractile function and heart rhythm were monitored. Preconditioned groups were compared to control groups.

Results: Left ventricular developed pressure (LVDP) and the product LVDP x heart rate (HR) were significantly higher in the hypertrophic preconditioned group than the hypertrophic control group while left ventricular end diastolic pressure (LVEDP) and severe arrhythmia episodes did not differ. Variances between the normal heart groups were not significantly different except for the values of the LVEDP in the beginning of reperfusion.

Conclusions: Remote preconditioning seems to protect myocardial contractile function in HM, while it has no beneficial effect in normal myocardium.

OP83—DYSREGULATION OF PRO-ANGIOGENIC FACTORS RESULTS IN FAILURE OF THE HYPERTROPHIED HEART

Zeriouh, M.,[1] Choi, Y.-H.,[1] Neef, K.,[1] Liakopoulos, O.J.,[1] Stamm, C.,[2] Slottosch, I.,[1] Wittwer, T.,[1] Wahlers, T.[1]

[1]Heart Center, University of Cologne, Department of Cardiothoracic Surgery, Köln, Germany; [2]Deutsches Herzzentrum Berlin, Department of Cardiothoracic and Vascular Surgery, Berlin, Germany

Objectives: Progressive pressure-overload LV hypertrophy is characterized by a decreased myocardial capillary-to-myocyte ratio and increased susceptibility to an ischemia-reperfusion (I/R) injury resulting in ventricular dilation and heart failure. In this study we investigated the underlying mechanisms which are responsible that the myocardium fails to adapt.

Methods: Six-week-old NOD-scid mice underwent transverse aortic constriction (TAC, n = 7) in order to induce LV pressure-overload hypertrophy. Gene-expression-levels of HIF-1, HIF-2, VEGF, VEGFR-1, VEGFR-2, and SDF-1 were determined by quantitative PCR-analysis at 1 day, 7 days, 14 days, and 21 days post-TAC and compared to sham-operated controls (n = 7). Myocardial capillary density was determined by immunohistochemistry (caveolin-1) 21 days post-TAC.

Results: HIF-1 and VEGFR-1 (103%, 106%, both $P > .4$) gene expression levels were not different at day 1 post-TAC, but HIF-2, VEGF, VEGFR-2, and SDF-1 expression levels were significantly reduced compared to controls (89%, 88%, 60%, 76%, all $P < .02$). Expression levels of all genes were significantly reduced at all time-points during follow-up, reaching a minimum at 7 days post-TAC. Except for HIF-1 and VEGF, which reached baseline levels (79%, 87%, both $P > .3$) at 21 days post-TAC, all remaining gene remained far below base line (all < 60% and $P < .01$). Capillary density was significantly reduced in the TAC group (2531 ± 321/mm² versus 2143 ± 293/mm², $P = .021$).

Conclusions: Pressure-overload hypertrophy is characterized by decreased expressions-levels of HIF-1, HIF-2, VEGF, VEGFR-1, VEGFR-2, and SDF-1, which play a major role in reduced capillary density and increased myocardial susceptibility to ischemia-reperfusion injury. These findings may provide a new target for gene or cell therapy to prevent the onset of heart failure in myocardial hypertrophy.

OP84—NEW ASPECTS FOR A SURGICAL HEART FAILURE THERAPY WITH SKELETAL MUSCLE USING FATIGUE-RESISTANT TYPE IIA MUSCLE FIBRES

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Background: Muscle powered cardiac assist using latissimus dorsi muscle (LDM) with 100% type I fibers was stopped clinically due to hemodynamic inefficacy and muscle damage. This study, however, investigates a pre-stimulated LDM with 50% fatigue-resistant type IIa fibres.

Methods: Left LDM of male Bore Goats group A (n = 5) was control and B (n = 5) was electrically in-situ pre-stimulated for

2 weeks. LDMs were wrapped around an intra-thoracic elastic training device as a skeletal muscle ventricle (SMV) and pumped over 4 to 9 months. Electrical stimulation patterns for 100% type I-fibres were chosen in group A and those with 50% fatigue-resistant type IIa fibres in group B. Blood flow and capillary to fiber ratio were determined in each group after pre-stimulation. Fluid dynamic was determined in A and B. Myosin heavy chain and morpho-metric muscle analysis were performed after pumping.

Results: In the pre-stimulated LDM of group B, blood flow during LDM contractions was 52% higher than in A, and capillary to fiber ratio was enhanced by 38% ($P < .01$). Fluid dynamic parameters of SMVs were improved in the 50% type IIa fibre muscle: SV 46 mL versus 14 mL ($P < .01$). Muscles of group A demonstrated severe muscle damage, and those of B were well preserved.

Conclusion: These data indicate that muscle powered cardiac assist with 100% type I fibers was a big misunderstood with extremely reduced muscle function and severe muscle damage. Myo-stimulators enabling 50% type IIa fibers will be available within the next months (Microstim GmbH, Germany) and let us expect an effective muscular myocardial support.

OP85—SURGICAL VENTRICULAR RECONSTRUCTION IMPROVES CARDIAC METABOLIC EFFICIENCY AFTER MYOCARDIAL INFARCTION IN RATS

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Surgical ventricular reconstruction (SVR) after myocardial infarction can enhance cardiac function. Improvements in metabolic efficiency have been shown to increase cardiac performance. However, the impact of SVR on myocardial substrate metabolism is unknown.

We investigated myocardial substrate metabolism 2 weeks after SVR in post-infarcted rat hearts.

Infarction was induced through a lateral thoracotomy with ligation of the left anterior descending artery (LAD) in 6-week-old Sprague Dawley rats. Two weeks after LAD-ligation animals were assigned to undergo sham or SVR procedures. SVR was performed via a horizontal sternotomy and exclusion of the scar through a tobacco-pouch suture technique. Two weeks later, echocardiography was used to assess cardiac size and function. Isolated heart perfusion was employed to measure glucose and fatty acid oxidation rates as well as cardiac power.

Myocardial infarction led to left ventricle (LV) dilation and aneurysm formation, as seen in echocardiography (LVEDD in mm: 7.63 ± 0.31 versus 7.02 ± 0.11; $P < .05$). SVR significantly reduced LV size (LVEDD: 7.42 ± 0.62 versus 9.23 ± 0.26; $P < .05$) and slightly improved cardiac function (FS in %: 26.8 ± 4.5 versus 18.0 ± 2.2). Heart-to-body weight ratios revealed a tendency to hypertrophy after SVR (HW/BW in g/Kg: 5.33 ± 0.39 versus 4.67 ± 0.22) whereas lung-to-body weight ratios showed no evidence for decompensation, ie, lung edema, when compared to age-matched controls. In the isolated working mode, these hearts showed no difference in cardiac power (CP). Accordingly, fatty acid oxidation (FAO) rates were also comparable, as well as glucose oxidation (GO). However, when compared as ratios of GO/CP, reconstructed hearts showed a significant decrease in GO demand for the same amount of output (GO/CP in µmol/L: 0.26 ± 0.04 versus 0.76 ± 0.24; $P < 05$) while FAO/CP was not changed.

These findings suggest an important increase in myocardial efficiency after SVR, which is demonstrated by an expressive improvement in the conversion of substrate oxidation into work.

OP86—ONCOSTATIN M EVOKES SYMPTOMS OF DILATED CARDIOMYOPATHY THROUGH THE MEK/ERK MODULE

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Objectives: Dilated cardiomyopathy (DCM) is often the end result of damage to the myocardium. During the course of the disease, various processes are initiated which lead to the activation of the fetal gene program (FGP) and remodelling of cardiomyocytes. A key feature of DCM is the infiltration of the myocardium with inflammatory cells, which release various cytokines. We wanted to explore the impact of one of these cytokines, Oncostatin M (OSM), on cardiomyocytes in vitro and in vivo and understand the signaling mechanisms involved.

Methods: Cultured adult cardiomyocytes (CAC) were treated for 8 days with OSM. Other members of the interleukin-6 (IL-6) class of cytokines served as controls. Intracellular pathways were analyzed with specific chemical inhibitors or siRNA. In vivo studies were performed by intraperitoneal injection of OSM into mice for 2 weeks. Samples were analyzed by Western blotting (WB), 2DE-analysis combined with mass spectrometry (2DE-MS), and immunofluorescence (IF). Patients with DCM were analyzed by WB and IGF.

Findings: OSM strongly activated the FGP in cardiomyocytes, as seen by significant expressions of a smooth muscle actin (SM-Actin), Destrin, and atrial natriuretic peptide (ANP). 2-DE-MS and WB analysis revealed more than 10 reexpressed proteins. The capability of OSM to induce FGP was more than 10-fold stronger than other members of the IL-6 class of cytokines such as IL-6, leukemia inhibitory factor (LIF), and cardiotrophin. Among the various MAPK inhibitors tested only the MEK1/2 inhibitor UO126 (5µM) abolished activation of the FGP in cultured cardiomyocytes. Knock down of the OSM receptor (OSMRß) by siRNA completely prevented MEK1/2 activation and FGP. In mice OSM significantly activated the OSMRß complex and stimulated the MEK/ERK pathway. Mice treated with OSM showed more than 2- to 3-fold increases in destrin, SM-actin, and ANP ($P < .001$). IF demonstrated that SM-Actin, ANP, and destrin were localized in cardiomyocytes. In DCM patients we observed a significant increase of the expression of OSM and the OSMRß together with an activation of the FGP.

Conclusions: We concluded that the OSMRß/MEK/ERK axis is sufficient for activation of FGP and pathological remodelling in DCM.

OP87—MHC REQUIREMENTS FOR CHRONIC ALLOGRAFT REJECTION AFTER ORTHOTOPIC LUNG TRANSPLANTATION IN MICE

Schmitt-Knosalla, I.,[1] Brösel, S.,[1] Andersson, A.,[1] Yeter, R.,[2] Dandel, M.,[2] Volk, H.-D.,[1] Hetzer, R.,[2] Knosalla, C.[2]
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Background: Long-term success in lung transplantation continues to be challenged by chronic graft dysfunction, which is manifest as bronchiolitis obliterans. Mechanisms that lead to chronic lung allograft rejection are poorly understood because their study has been hampered by the lack of a physiologically relevant mouse model of lung transplantation.

Since transplantation over a histocompatibility complex II mismatch barrier is a standard model of murine cardiac allograft rejection, we applied it in the orthotopic lung transplantation model in mice.

Methods: Lung allografts from C57BL/6.CH-2^{bm12} (bm12) were transplanted orthotopically into C57BL/6 (H-2^{b}) recipients. In the syngeneic group, C57BL/6 grafts were transplanted into C57BL/6 recipients. Rejection or long-term survivors were confirmed by direct visualization after thoracotomy. Between weeks 8 and 10 posttransplantation, lung graft, spleen, and lymph nodes were harvested from C57BL/6 recipient mice and scored histologically for evidence of acute and/or chronic cellular rejection. Flow cytometry was performed for graft infiltrating cells. Titers of immunoglobulin were measured by flow cytometry in the different recipient groups.

Results: Syngeneic grafts revealed an almost unchanged macroscopic appearance, and the oxygenation capacity was preserved up to day 180 posttransplantation. More than 75% of bm12 transplanted grafts were completely or partially rejected between days 54 and 84 after transplantation. Macroscopic appearance of lung graft rejection was similar to the chronic heart allograft rejection model using the same combination bm12 into C57BL/6. Microscopic analysis revealed chronic vascular rejection without involvement of small cartilaginous airways.

Conclusion: These data support a model in which the development of bronchiolitis obliterans does not depend on MHC class II antigens. They highlight the importance of identifying differences in pathways that regulate the rejection of various organs.

Congenital Heart Diseases III

TUESDAY, JUNE 14, 2011, 16:30 – 18:00 H

OP88—FIFTEEN YEARS OF EXPERIENCE IN REPAIR OF AORTOPULMONARY WINDOW IN CHILDREN

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Introduction: Aorto-pulmonary window is a very rare malformation that accounts for about 0.15% of cardiac anomalies.

Methods: We reviewed our 30 cases from 1992 to 2007. The approach for AP Window repair was ligation without CPB in 2 cases, division and suturing using CPB in 1 case, trans-window in 19 cases, trans-aortic in 9 cases, and trans-pulmonary in 2 cases.

Results: Male-to-female ratio was 2:1. Mean age of the patients was 28 ± 9 months (range 2-90), weight 8.6 ± 4.6. Preoperative EF was 0.66 ± 0.07, which increased to 0.75 ± 0.07 postoperatively. Nineteen (63%) patients had associated cardiac anomalies, most frequently aortic stenosis (23%) followed by interrupted aortic arch. The overall in-hospital mortality was 10%. Among the 27 survivors, the mean ICU stay was 4.4 days, and the mean postoperative hospital stay was 10.7 days. Early complications were bleeding (2 cases), pneumonia (1 case), and CVA (1 case). Mean follow-up was 49 months, and there was no re-operation or late death. There were 4 cases of residual AP Window detected by echocardiography; none of them required re-intervention. Among patients with residual AP Window 2 cases were seen with banding technique (100%), 1 case with trans-aortic patch repair (11%), and 1 case with trans-window patch repair (5%).

Discussion: Age, sex, and weight had no clear impact on postoperative course. As mentioned earlier, the overall in-hospital mortality was 10% (3 patients). The reported mortality among other series ranged from 7.6% to 27%. Also there was no difference among various methods of repair in respect of morbidity, ICU stay, ventilator support, and postoperative EF.

Conclusion: Trans-aortic repair of APW is the procedure of choice for all APWs, except in the case of large defects where anterior sandwich patch technique (trans-window repair) may be done. In our view, simple ligation without CPB should be avoided.

OP89—SURGICAL RELIEF OF VASCULAR AIRWAYS COMPRESSION: A SINGLE CENTER EXPERIENCE

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Background: Tracheo-bronchial vascular compression is a rare disorder in children with important clinical consequences.

Materials and methods: We reviewed 46 cases (11 with a tracheal stent previously implanted) of surgical relief of airways

compression performed from January 2006 to December 2010. Mean age was 32.1 ± 40 months (range 1.8 month to 15 years). Airway compression was documented preoperatively by bronchoscopy. Anatomical diagnosis was completed by CT scan.

Vascular anomalies included 4 anomalous right subclavian artery, 4 bicarotic trunk, 8 innominate artery abnormal take-off, 13 vascular rings, and 15 left bronchial compression due to left pulmonary artery-descending thoracic aorta forcep (LBCDA), an anomaly whose effects were poorly described before .

In 17 patients a previously treated esophageal atresia/tracheo-esophageal fistula was a concomitant cause of tracheo-bronchial compression. Three patients had residual compression after surgical relief of a corrected double aortic arch.

Results: Various surgical techniques were employed: posterior aortopexy (19 cases), anterior aortopexy (18), and vascular ring repair (9). Intraoperative bronchosphy was performed in all the cases. LBCDA was corrected by posterior aortopexy of descending thoracic aorta.

At a median follow-up of 26.5 ± 20.5 months there was no early or late mortality. Symptoms were abolished in 44 of 46 patients. Reoperation for residual compression was successfully performed in 2 cases. In 6 cases residual tracheomalacia was documented during intra-operative bronchoscopy with concomitant stent implantation. In 4 out of 11 patients the preoperative implanted stent was removed after surgery.

Conclusions: We present a wide spectrum of airway compression, including a poorly or never described defect. Airways compression relief may be accomplished by the way of safe and easy techniques with good immediate and intermediate results. In several cases, however, surgery alone cannot resolve the tracheomalacia, and a hybrid approach with stent implantation on bronchoscopy may be necessary.

OP90—HYBRID DEVICE CLOSURE OF SEPTAL DEFECTS THROUGH A PERTHORACIC INCISION USING ECHO GUIDANCE

Kapadia, N.,[1] Ratnagiri, R.,[2,3] Rao, S.,[4] Balakrishnan, K.,[5] Choudhary, S.[5]
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Objective: The percutaneous approach for closing ASDs and VSDs in Cardiac Cathlab is extremely difficult in patients weighing less than 15 kg and requires long procedure time and excessive cost. We have developed hybrid cardiac procedures to overcome disadvantages of Cathlab and conventional cardiac surgery through a minimally invasive access without cardiopulmonary bypass.

Methods: Between March 2010 and January 2011, 21 patients underwent device closure of the septal defects, 18 ASDs, and 3 VSDs. Age range was 5 months to 45 years (weight 7 kg to 56 kg). Maximum ASD or VSD size was measured accurately by both transesophageal echocardiography and transthoracic echocardiogrphy in operating room itself. 5 cm right anterolateral submammary incision in 4th intercostal space was used for ASD or 5-7 cm lower sternal incision for VSD closure. Right atrium or right ventricle was punctured with Seldingre's technique through purse string and A 10-14 French. Checkflow sheath was then passed through the atrial/ventricular septal defect, verified by transthoracic echo. One disc of the double disc occluders was opened in LA and other disc opened in RA. Adequacy of closure of the defects. Ventricular septal defects were closed though subxiphoid small 4-6 cm incisions, pursestring on right ventricle, and devices were deployed. All patients were put on aspirin for 6 months.

Results: Three patients required use of heart–lung machine. Average operative time was 35 minutes; 16 patients were extubated within 6 hours of surgery. Patients were on aspirin for 6 months. There was no operative or late mortality.

Conclusion: Non cathlab based technique using echo will find widespread acceptance in countries like Africa. The technique has also inherent advantages in terms of patient safety, non requirement of blood transfusion, absence of sternotomy incision, and no radiation.

OP91—BIODEGRADABLE REMODELING ANNULOPLASTY RING TO ADDRESS ATRIOVENTRICULAR VALVE REGURGITATION IN COMMON ATRIOVENTRICULAR CANAL DEFECTS: A MULTI-INSTITUTIONAL GLOBAL COLLABORATIVE EXPERIENCE

Myers, P.,[1] Cikirikcioglu, M.,[2] Mrowczynski, W.,[3] Baird, C.W.,[1] del Nido, P.J.,[1] Kalangos, A.[2]
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Objective: Atrioventricular valve regurgitation is the most common reason for late reoperation after common atrioventricular canal repair. The purpose of this report is to review a multi-institutional experience in using a biodegradable ring in AV valve repair in patients with common AV canal defects.

Methods: From 2004 to 2009, 20 patients (mean age 9.2 ± 9.5 years) underwent operation for AV valve repair. Eleven patients had partial AV canal, and 9 had complete AV canal. Thirteen were reoperations. A mitral Bioring Kalangos (Bioring, Lonay, Switzerland) was used in 16 patients on the left AV valve (mean size 23.2 ± 3.6), and a tricuspid Bioring was used in 6 patients on the right AV valve (mean size 19.7 ± 3.4).

Results: There was 1 early death. Early postoperative echocardiography showed a mean AV valve regurgitation grade of 0.5 ± 0.8 (3 patients with mild regurgitation, the remainder with trivial or none), a mean transvalvular gradient of 2.6 ± 2.6 mmHg, and an annulus of 26.1 ± 7.5 mm for the left AV valve, and a regurgitation grade of 0.4 ± 0.9 (1 patient with moderate regurgitation, the remainder trivial or none) and a mean transvalvular gradient of 0.6 ± 1.2 mmHg for the right AV valve. During a mean follow-up of 42.1 ± 27.5 months (range 1-88 months), there were no late deaths. Two patients required left AV valve reoperation for valve replacement, 1 for endocarditis, and 1 for worsening regurgitation. In the remaining patients, the mean left AV regurgitation grade progressed to 1.1 ± 0.9 (1 patient with moderate regurgitation, 2 with mild), with transvalvular gradients of 2.6 ± 1.7 mmHg and annulus dimensions of 33.6 ± 2.9 mm. The mean right AV regurgitation and gradients remained stable.

Conclusions: The biodegradable ring showed satisfactory results in stabilizing the dilated AV annulus at mid-term follow-up, and represents a novel tool in the surgical armamentarium for valve repair.

OP92—DIFFERENT APPROACHES IN TREATMENT OF CONGENITAL CORONARY FISTULAE

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Objective: The aim of present work is to present 2 adult patients with coronary fistulae, treated with 2 different methods: conventional surgery and transcatheter closure.

Methods: From January 2008 to December 2010, 2 adult female patients (1 54 years old and the other 22 years old) with congenital coronary arterio-venous fistulae were operated in our institution. Both patients had meticulous preoperative diagnostics including chest X-ray, TTE, left and right heart catheterization, and CT angio. All measurements show fistula of RCA and giant aneurysm of the artery. The first patient was operated, and the second underwent transcatheter closure with Amplatzer.

Results: The first patient underwent surgical closure of the aneurysm of RCA. The aneurysm was opened, and all big branches were sutured. The ostium of RCA was suture ligated. Double aortocoronary bypass with saphenous venous grafts was performed to ramus acute marginal and RPD. The postoperative course was inevitable with a single episode of AF. The patient was discharged on 10th POD. The second patient underwent Amplatzer closure of fistula with percutaneous approach. The patient was discharged on 5th POD after uneventful postprocedural period.

Conclusions: Our experience shows that both conventional surgery and transcatheter closure of congenital coronary arterio-venous fistulae show excellent results if the patient's selection is adequate.

Heart Lung Failure II

TUESDAY, JUNE 14, 2011, 16:20 – 18:10 H

OP93—INFLAMMATORY CYTOKINES IN PLEURAL FLUID, AFTER LUNG TRANSPLANTATION, AS A MARKER FOR THE DEVELOPMENT OF ACUTE REJECTION

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Heart Institute (InCor) / University of Sao Paulo Medical School, Thoracic Surgery, São Paulo, Brazil

Background: Lung transplantation is the procedure of choice for end-stage lung diseases. Despite all the improvements in immunosuppression, acute rejection remains common, especially from the 2nd week after transplantation. There are several studies correlating serum cytokines and acute rejection and bronchiolitis obliterans syndrome. However, there are no reports correlating pleural fluid cytokines and the development of acute rejection.

Methods: The study included 20 patients, ages 17 to 61 years, who underwent lung transplantation unilateral or bilateral, between August 2006 and March 2008. A sample of 20 mL was collected from the pleural fluid after lung transplantation, in periods of 6, 24, 48, and 96 hours for measurement of inflammatory cytokines. The results of pleural cytokines were correlated with the results of transbronchial biopsy of the 2nd and 6th weeks after transplantation.

Results:

Period	Without rejection (A0)	Rejection A1	Rejection A2	Rejection A3
6 h	1318.7 ± 422.1	1535.6 ± 709.9	1602.0 ± 428.7	2216.8 ± 150,8*
24 h	1266.5 ± 381.8	1290.5 ± 772.	1253.0 ± 656.1	2187.2 ± 95.5*
48 h	1091.7 ± 468.5	1148.8 ± 542.5	979.2 ± 255.1	2036.7 ± 160.9*
72 h	965.2 ± 545.7	1103.4 ± 705.9	925.1 ± 321.2	1935.7 ± 226.8*
96 h	981.9 ± 706.1	721.8 ± 686.0	724.3 ± 559.6	1859.3 ± 118.8*

[IL-8]

P < .05 - Rejection 3 > 2, 1, and 0

Period	Without rejection (A0)	Rejection A1	Rejection A2	Rejection A3
6 h	72.3 ± 53.4*	374.4 ± 138.5	333.3 ± 241.9	522.0 ± 485.6
24 h	123.2 ± 148.6	200.0 ± 103.2	275.2 ± 207.0	421.7 ± 426.9
48 h	121.3 ± 142.1	134.9 ± 63.1	263.0 ± 189.4	218.4 ± 248.8
72 h	142.8 ± 176.7	163.3 ± 83.	299.4 ± 215.4	211.9 ± 256.2*
96 h	144.9 ± 192.3	226.3 ± 203.6	329.2 ± 216.7	265.7 ± 242.9

[VEGF]

P < .05 - Rejection 0 < 1, 2, and 3

Period	Without rejection (A0)	Rejection A1	Rejection A2	Rejection A3
6 h	14.717 ± 5.796	30.880 ± 13.903	38.253 ± 10.065	48.325 ± 7.164*
24 h	6.384 ± 5.770	14.290 ± 5.169	13.355 ± 5.601	31.749 ± 22.269*
48 h	7.642 ± 6.978	11.336 ± 2.420	10.383 ± 5.398	27.988 ± 25.172**
72 h	5.010 ± 3.936	7.520 ± 2.929	5.058 ± 3.101	6.934 ± 2.836
96 h	2.879 ± 966#	7.379 ± 1.441	6.005 ± 3.499	6.151 ± 2.203

[IL-6]

**P* < .05 - Rejection 3 > 0 and 1, ***P*< .05 - Rejection 3 > 0, #*P*< .05 - Rejection 0 < 1, 2, and 3

Conclusions: We demonstrate that elevated levels of inflammatory cytokines in pleural fluid may be related to the development of acute rejection, up to 6 weeks of transplantation, with greater significance considering the severe rejection (A3).

OP94—TRANSPLANTATION VERSUS MEDICAL TREATMENT IN ELDERLY PATIENTS WITH SEVERE IDIOPATHIC PULMONARY ARTERIAL HYPERTENSION

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Background: Previously we found that despite all benefits provided by modern medical treatment, transplantation (Tx) remained the most promising therapy for survival with idiopathic pulmonary arterial hypertension (IPAH) once Tx-listing criteria were fulfilled. However, IPAH is diagnosed also beyond age of 50 and for these patients with higher risk for Tx, life expectation and efficacy of available therapies are barely known. We assessed this issue.

Methods: We analyzed the outcome of patients with IPAH detected beyond the age of 50 years who were referred for Tx since 1994. We compared patients' survival with and without Tx and analyzed the efficacy of medical treatment using a stepwise therapeutic regimen, which included bosentan, sildenafil, and iloprost.

Results: Of 38 IPAH patients (age 60 ± 6 years at diagnosis) who were referred for Tx, 34 appeared to require Tx-listing. Of these 34 potential Tx candidates, 22 (age 61.5 ± 6.4 years at diagnosis) received medical treatment without Tx; the other 12 (age 57.2 ± 3.2 at Tx) underwent heart–lung (n = 7) or double-lung Tx (n = 5). Although 2 patients who were transplanted beyond the age of 60 years had excellent long-term outcome, the whole group of transplantation patients showed no survival benefit when compared with the group of patients who remained on medical treatment. The probability of 5- and 8-year survival in the 2 transplant candidate groups (medical treatment only versus Tx), calculated from the time of IPAH diagnosis, was 53.6% and 38.3% versus 50% and 20%, respectively.

Conclusions: Iloprost inhalation alone or in combination with oral bosentan and/or sildenafil appears effective for end-stage IPAH therapy in patients over 50 years old at the time of diagnosis. These patients show more survival benefit from medical treatment than from Tx, although good outcomes after Tx appear possible for selected patients who undergo Tx between 60 and 65 years of age.

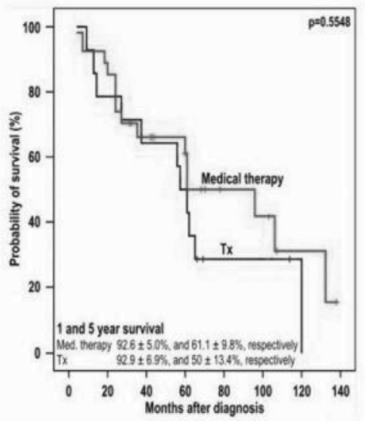

Figure 1. Survival probability with and without Tx in patients after IPAH diagnosis beyond the age of 50 years

[Figure 1]

Heart Lung Failure I

TUESDAY, JUNE 14, 2011, 11:20 - 13:20

OP95—HEART TRANSPLANT CANDIDATES WITH OBESITY CLASS I ARE AT HIGHER RISK OF MORTALITY ON WAITING LIST AFTER PROGRESSION TO CRITICALLY ILL STATUS IN GERMANY

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Objectives: Although extreme obesity and being underweight are both known as risk factors for mortality in patients with ventricular assist device (VAD) and in those listed for urgent heart transplantation (HTx), the risk in patients between these extremes is controversial. We studied mortality on the waiting list for HTx after progression to critically ill status (ie, urgency listing or VAD implantation) in Germany in patient groups stratified by body mass index (BMI).

Methods: Among 536 adult candidates for de novo HTx who were newly listed as T (transplantable) by Eurotransplant without VAD support in our center between 2000 and 2009, 285 progressed to critically ill status. Risk of mortality on waiting list was studied in the following groups: normal weight patients, Group N (n = 123), BMI ≥18.5 and <25.0 kg/m^2; overweight patients, Group OWt (n = 107), BMI ≥25.0 and <30.0 kg/m^2; and patients with obesity class I, Group OB-I (n = 38), BMI ≥30.0 and <35.0 kg/m^2.

Results: After progression into critically ill status, 1-year survival rate on the waiting list in Group N (60.9%) and Group OB-I (48.7%) was significantly lower than in Group OWt (73.5%, *P* = .039 and *P* = .022, respectively). After multivariable adjustment, Group OB-I (hazard ratio 2.069, 95% confidence interval [CI] 1.104–3.880, *P* = .023) and Group N (hazard ratio 1.889, 95% CI 1.093–3.267, *P* = .023) were at higher risk of mortality compared with Group OWt.

Conclusions: HTx candidates in obesity class I have worse prognosis on the waiting list after progression into critically ill status in Germany. A protective effect of obesity on mortality was not observed in this setting.

OP96—THIRD AND FOURTH TIME CARDIAC RETRANSPLANTATION

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Objectives: Cardiac retransplantation is 2%-3% of all transplantations each year. Third and fourth time retransplantations make up an even smaller proportion of those transplantations.

Though a small number of the whole, third and fourth cardiac retransplantations are possible and have excellent survival.

Methods: We conducted a retrospective chart review of all patients that had a third and fourth cardiac retransplantation. We evaluated pretransplantation demographics including age, gender, echocardiograms, immunosuppression, reason for retransplantation, and survival status.

Results: Four patients received a third transplant, and 1 of the 4 received a subsequent fourth transplant. All patients were retransplanted for accelerated graft atherosclerosis (AGAS). The mean age at the time of the third transplantation was 34 years (18-53 years); the patient who received the fourth transplantation was 28 years old. All the patients were male, and the average creatinine at the time of the third retransplantation was 1.575. The total survival after the first transplantation was a mean of 20.2 years (15.3-24.75 years). The 3 third time transplantation patients died secondary to AGAS, sudden death and a viral infection with an average of 19.5 years survival. The fourth time retransplantation patient is alive at 22 years after his first transplantation. He is currently in chronic renal failure and being evaluated for kidney transplantation.

Conclusions: We would expect most patients coming for multiple cardiac retransplantations to have started as children. Our series, though small, demonstrates that in a select patient population third and fourth time cardiac transplantations are possible and have good survival outcomes.

Adult Cardiac Surgery VI

WEDNESDAY, JUNE 15, 2011, 09:10 – 10:40 H

OP97—EXCELLENT RESULTS OF TRANSAPICAL AORTIC VALVE IMPLANTATION IN PATIENTS WITH SEVERE CALCIFICATION OF THE ASCENDING AORTA

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Objectives: Despite different surgical strategies in patients with calcification of the ascending aorta, postoperative stroke and mortality rates remain high after conventional aortic valve replacement but the results of transapical aortic valve implantation in these patients are not known. This study evaluate the outcome of transapical aortic valve implantation in patients with severely calcified ascending aorta in a single center.

Methods: Since April 2008, 350 patients with severe aortic valve stenosis underwent TAP-AVI. By CT scan we identified 53 (15%) patients (mean age 78 ± 9, range 63-89 years) with unclampable aorta because of severe calcification (17 with porcelain aorta and 36 with semicircular calcification). Mean logistic Euroscore and mean STS score were 43 ± 22 and 23 ± 14, respectively. Fifteen patients had had previous cardiac operations.

Results: Primary valve implantation was successful in 51 patients. Second valve (valve-in-valve) was implanted in 2 patients. Seven patients underwent concomitant interventions (4 elective PCI, 1 OPCAB, 1 tricuspid valve reconstruction, 1 LV aneurysmectomy). At the end of procedure, 4 (7.5%) patients had valve incompetence (trace or grade I) and 15 (28%) paravalvular leak (trace in 10, grade I in 5). The 30-day mortality was 1.8% (1 patient with poor left ventricular function). Postoperatively, cranial CT showed new cerebral ischemia areas in 3 patients (5.6%), but only 1 patient (1.8%) experienced postoperative neurological deficit (temporary aphasia). Survival at 12 and 24 months was 87% and 79%, respectively.

Conclusions: In patients with aortic valve stenosis and severe calcification of the ascending aorta, transapical aortic valve implantation can be performed safely and with a very low incidence of neurological events and mortality. This procedure should be considered as the first therapy in these patients.

OP98—TRANSAPICAL AORTIC VALVE IMPLANTATION IN HIGH-RISK PATIENTS WITH SEVERELY DEPRESSED LEFT VENTRICULAR FUNCTION

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Objective: Transcatheter aortic valve implantation significantly reduces mortality in patients who cannot undergo conventional aortic valve replacement. However, it is unknown whether this procedure is feasible in patients with severely depressed left ventricular function or in the presence of cardiogenic shock.

Methods: Since April 2008, 350 patients have undergone transapical aortic valve implantation. Thirty-two patients presented with advanced heart failure and a left ventricular ejection fraction between 10% and 25%. The mean age of these patients was 78 ± 11 years (range 36 to 91 years). The mean logistic EuroSCORE was 69 ± 19% (range 27 to 97%), and the mean STS score was 37 ± 25% (range 4% to 90%). Fourteen patients were in cardiogenic shock preoperatively. Fourteen patients were operated on using femoro-femoral cardiopulmonary bypass and 18 without.

Results: Technical success of the procedure was 100%. The left ventricular ejection fraction increased significantly from 20 ± 5% preoperatively to 40 ± 11% postoperatively ($P < .001$). There were no new postoperative neurological complications. A new pacemaker implantation was needed in 2 of 30 patients (7%). The 30-day mortality was 12.5% for all 32 patients and 5.6% for all 18 patients without cardiogenic shock. Survival at 12 and 24 months was 76% and 62%, respectively.

Conclusions: Transapical aortic valve implantation can be performed safely in critical patients with advanced heart failure or even in the presence of cardiogenic shock.

OP99—INCREASED PREOPERATIVE B-TYPE NATRIURETIC PEPTIDE LEVELS PREDICT EARLY CLINICAL OUTCOMES AND MIDTERM SURVIVAL AFTER AORTIC VALVE REPLACEMENT

Miceli, A., Gilmanov, D., Concistrè, G., Murzi, M., Chiaramonti, F., Gasbarri, T., Varone, E., Pettinà, L., Ferrarini, M., Bevilacqua, S., Farneti, P.A., Glauber, M.

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Objectives: Plasma levels of B-type peptide (BNP) have been shown to predict development of symptom onset and survival in patients with aortic stenosis (AS). However, in setting of aortic valve replacement (AVR), BNP prognostic value is not well defined. This study evaluates the effect of preoperative BNP levels on early clinical outcomes and midterm survival in patients with AS after AVR.

Methods: A retrospective, observational, cohort study was undertaken of prospectively collected data on 421 consecutive patients with AS undergoing isolated AVR between January 2005 and July 2010. Patients were divided into quartiles according to BNP levels.

Results: Overall in-hospital mortality was 2.6%. The incidence of death, atrial fibrillation (AF), and postoperative renal dysfunction (PRD) was 0.9%, 21.9%, and 1.9%, respectively, in the lowest quartile (BNP < 88 pg/mL); 0%, 35.6%, and 2.9%, respectively, in the second quartile (BNP > 89 to < 191 pg/mL); 1.9%, 40.5%, and 3.8%, respectively, in the third quartile (BNP > 192 to 417 pg/mL); and 7.5%, 44.2%, and 9.5%, respectively, in the highest quartile (BNP > 418 pg/mL). In a multivariable logistic regression, BNP > 418 pg/mL was an independent predictor of mortality (OR 5.4, 95% CI 1.13–26.2, $P = .02$) and AF (OR 1.7, 95% CI 1.04–2.88, $P = .03$). Moreover, when modelled as continuous variable, probability of mortality and AF increased with increasing BNP levels. Cumulative 5-year survival of patients with BNP > 418 pg/mL was 64.5 ± 10% versus 79 ± 6.5% with BNP < 418 pg/mL ($P < .0001$).

Conclusions: Increased plasma level of B-type peptide (BNP > 418 ng/mL) in patients with AS undergoing AVR is a predictor of poor early outcomes and midterm survival.

OP100—LOW RATES OF ADVERSE EVENTS AFTER 15 YEARS OF FOLLOW-UP OF ST. JUDE MEDICAL MECHANICAL PROSTHESIS: A SINGLE CENTER EXPERIENCE

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Objectives: The objective of this study is to retrospectively analyse our 15-year clinical results with St. Jude Medical (SJM) mechanical heart valve prosthesis (MHV).

Methods: Between January 1994 and March 2004 a total of 1141 SJM-MHV were implanted in 1085 patients (pts): 869 aortic valve replacement (AVR), 201 mitral valve replacement (MVR), and 56 aortic and mitral valve replacement (DVR). There were 687 male and 441 female pts, respectively. The mean age of the 1141 pts was 63.3 ± 11.3 years. The mean follow-up time was 9.4 + 3.5 years with a cumulative follow-up of 4691 patient-years.

Results: Follow-up is 92% complete. Overall hospital mortality was as follows: AVR 2.7 % (11 pts), MVR 3.5% (7 pts), and DVR 7.0 % (4 pts). During the 15-year follow-up, 161 pts (14.1%) died. Of these deaths, 2.7% were valve-related. Freedom from thromboembolic events was 88%, freedom from bleeding events was 86%, freedom from reoperation was 99%, freedom from endocarditis was 99%, and freedom from valve thrombosis was 99%. There was no event of structural failure.

Conclusion: The SJM-MHV shows excellent clinical long-term results associated with a low incidence of valve-related complications.

OP101—HOMOGRAFT AORTIC ROOT REPLACEMENT IN NATIVE OR PROSTHETIC ACTIVE INFECTIVE ENDOCARDITIS WITH PERIANNULAR ABSCESS

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Objective: We aimed to compare early and long-term results of cryopreserved homograft aortic root replacement (ARR) in native (NVE) or prosthetic valve endocarditis (PVE) associated with periannular abscess over the last 25 years.

Methods: Between May 1986 and December 2010, 1546 endocarditis patients were operated upon. Of these, 221 patients (185 men, median age 55 years) underwent homograft ARR due to 99 cases of NVE (45%) and 122 of PVE (55%); 189 patients (86%) developed periannular abscess formation. Perioperative characteristics, probability of survival, freedom from recurrence, and reoperation and valve-related events were analyzed. Follow-up was completed in all survivors, with a total of 1109 patient years.

Results: Overall survival at 30 days, 1, 5, 10, and 15 years was 78.6% ± 2.8%, 71.3% ± 3.0%, 56.8% ± 3.5%, 40.7% ± 3.9%, and 29.8% ± 4.8%, respectively, with significantly better survival of NVE than PVE patients ($P = .0293$) and a greater tendency towards abscess formation. Thirty-one (14.0%) required reoperation either for structural valve deterioration (SVD, n = 19, 8.6%, mean 1062 days) with a high risk in patients < 40 years or for endocarditis of the homograft (n = 12, 5.4%, median 98 days) with a tendency towards PVE.

Conclusions: Radical resection, reconstruction of LVOT, and homograft ARR for infected aortic root with periannular abscess has improved patient survival for primary and secondary operations, which is significantly better in NVE. The operation is associated with a low recurrence rate of most valve-related events, although the risk of SVD increases over time, especially in young patients. At our institution homograft ARR remains the preferred procedure in periannular abscess formation.

OP102—CLINICAL OUTCOME AFTER SURGICAL THERAPY OF INFECTIVE ENDOCARDITIS IN A TIME PERIOD OF 10 YEARS—EXPERIENCE WITH 647 PATIENTS

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Background and Aim of the Study: Surgical therapy of infective endocarditis is still considered as a particular challenge. The

study aim was to evaluate the clinical outcome of patients operated on for native (NVE) and prosthetic valve endocarditis (PVE).

Methods: Between Jan. 2000 and Dec. 2010, 647 patients (mean age 61 ± 13 years; 486 male [75.1%], 161 female [24.95%]) were referred for surgical therapy of infective endocarditis, including 473 patients with NVE, and 174 patients with PVE. Demographics, clinical preoperative conditions, indications to surgery, microbiological data, surgical pathology, and clinical outcome were evaluated.

Results: Isolated valve surgery was performed in 490 patients (75.7%), most affecting the aortic valve (50%; n = 324); multiple valve endocarditis was treated in 24.3% of patients (n = 147). Valve reconstruction was feasible in 56 patients (8.7%). Incidence of preoperative neurological events was 17.9% (n = 116). Overall hospital mortality was 11.6% (n = 75), with 8.5% among NVE patients and 20.1% among PVE ($P < .001$). Overall mortality in a time period of 10 years demonstrated no significant changes ($P = .46$).

Conclusions: Surgical therapy of infective endocarditis is associated with good clinical results, although an unchanged substantial mortality remains. Patients with PVE still are associated with impaired prognosis and represent one of the high-risk patient groups in valve.

OP103—LONG-TERM RESULT OF AORTIC VALVE INSUFFICIENCY AFTER PROSTHESIS-PATIENT MISMATCH WITH AORTIC VALVE REPLACEMENT: STUDY OF 22 YEARS

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Introduction: There has been an extensive study of the influence of Prosthesis-Patient Mismatch (PPM) with Aortic Valve Replacement, however controversy still exists. Little data are available regarding the effect of Prosthesis-Patient Mismatch aortic valve insufficiency with aortic valve replacement.

Methods: The mechanical prostheses as well the bioprostheses were implanted in (total no) patients with aortic valve replacement between 1982 and 2004 in which 426 patients developed Prosthesis-Patient Mismatch aortic valve insufficiency. The mean age was 56.6 ± 16.0 years with mean follow-up of 6.71 ± 5.2 years.

Prosthesis-Patient Mismatch was classified by effective orifice area index categories; not significant ≥0.85 and mild to severe < 0.85. Predictors of both mortality and morbidity were also calculated using univariate and multivariate analysis.

Results: The predictors of overall mortality were age, age categorization, congestive heart failure, prostheses type, and aortic annulus enlargement. Freedom from overall mortality was 44% over 20 years (146 death events). There were 54 cardiac related deaths. Both CHF and valve type were predictors of postoperative valve-related mortality. However, the valve type was the only postoperative valve-related morbidity predictor.

Conclusions: Prosthesis-Patient Mismatch after aortic valve replacement is not a predictor of overall mortality, cardiac death, or valve-related mortality and morbidity to 22 years' follow-up. Age, congestive heart failure, prostheses type, and aortic annulus enlargement influence the overall as well early and late mortality. Valve type is a key predictor factor in valve-related mortality and morbidity as well.

Basic Science II

WEDNESDAY, JUNE 15, 2011, 09:10 – 10:40 H

OP104—EFFECT OF HYPOXIC PRECONDITIONING ON MESENCHYMAL STEM CELLS IN CARDIAC REGENERATION IN A CHRONIC MODEL OF MYOCARDIAL ISCHEMIA IN PIG

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Introduction: Cell therapy using mesenchymal stem cells (MSC) is a promising approach in ischemic cardiac regeneration. Results are however contrasted due to the important cell loss during myocardial injection. To improve results of cell therapy, we evaluate the possibility to reduce stem cell loss modifying culture process.

We purpose to evaluate the effect of a hypoxia preconditioned culture of MSC before implantation in a model of chronic myocardial ischemia in pig.

Model and Results: Myocardial ischemia was realized with the help of an ameroid constrictor (3.5 mm) placed around the circumflex artery. Human MSC were prepared using 2 different techniques (normoxia or hypoxia). Thirty-three pigs have been operated. Mortality rate was 33.3%. Six Sham, 8 normoxia nMSC, and 8 hypoxia hyMSC were compared. Systolic (EF) and diastolic (E/Ea) function were increased in hyMSC compared to other groups (LVEF = 58 ± 5% versus 51 ± 4% nMSC and 48 ± 2% Sham, $P < 0.04$; E/Ea = 5.8 ± 2 versus 7±1 nMSC and 8 ± 2 Sham, $P < .04$). Inferolateral Strain was less altered in hyMSC (–19 ± 1% versus –14 ± 4% nMSC and –12 ± 2% Sham, $P < .01$). Dp/Dt max were improved in hyCSM (1940 ± 93 mmHg/s) compared to other groups (1105 ± 73 mmHg/s nMSC and 675 ± 54 mmHg/s sham, $P < .01$). Histological analysis showed that capillary density was increased in hyMSC (3037 ± 527/mm² versus 2408 ± 671/mm² nMSC and 1279 ± 420/mm² Sham, $P < .01$). Transplanted cells in the ischemic zone were most important in the hyMSC group (67/mm² versus 33/mm² nMSC, $P < .01$).

Conclusion: Hypoxic preconditioning of MSC during culture and before transplantation improves cardiac function and increases capillary density and transplanted cell survival. This strategy could be an interesting approach to progress in stem cell therapy.

OP105—EFFECT OF CORD BLOOD–MESENCHYMAL STEM CELL CONDITIONED MEDIUM ON SURVIVAL OF POST-HYPOXIC HL-1 CARDIOMYOCYTES

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Objectives: Cardiac cell therapy can help ameliorate the deleterious consequences of myocardial infarction in experimental models and in man, even in absence of de novo formation of contractile cells. Rescue of ischemically damaged cardiomyocytes from cell death by paracrine pro-survival signalling is one proposed mechanism, and several studies have provided in vitro and in vivo evidence. We tested the protective activity of human cord blood–mesenchymal stem cell (CB-MSC) conditioned culture medium on post-hypoxic cardiomyocytes in vitro.

Methods: Murine HL-1 cardiomyocyte-like cells were subjected to 24-hour hypoxia (1% ambient O2), followed by 24-hour normoxic reoxygenation, in the presence of CB-MSC conditioned medium or control medium. Cell death was assessed by propidium iodide uptake, and apoptotic cells presenting phosphytidylserine were visualized by Annexin V binding, using flow cytometry for quantification. Data were normalized for normoxic control HL-1 cells.

Results: In presence of CB-MSC conditioned medium the rate of propidium iodide positive cells after hypoxia and reoxygenation was lower than with control medium (1.3-fold increase versus 2-fold increase relative to normoxic control). In contrast, the number of Annexin V positive cells was 3-fold higher in the presence of CB-MSC conditioned medium than in normoxic control cells, but only 2-fold higher in hypoxic control medium. The proportion of Annexin V positive cells was also increased by CB-MSC conditioned medium under normoxic conditions.

Conclusions: While stem cell conditioned media reduces the total number of non-viable cells in response to hypoxia and reoxygenation, early apoptosis with cell membrane exposure of phosphytidylserine is in fact accelerated. The differential paracrine stem cell actions on pro-apoptotic signalling require further investigation.

OP106—NONINVASIVE IN VIVO TRACKING OF MESENCHYMAL STEM CELLS BY MRI AND EVALUATION OF CELL THERAPEUTIC EFFECTS

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Introduction: Stem cell transplantation is emerging as a promising approach for the regeneration of infarcted myocardium. The goal of this study is the *in vivo* analysis of stem cell transplantation with respect to localization and therapeutic effect by magnetic resonance imaging (MRI) in a murine model.

Methods: Murine mesenchymal stem cells (mMSC) were isolated from bone marrow, and cell line specificity was confirmed in vitro by adipo-, chondro-, and osteo-differentiation and FACS analysis after expansion. mMSC were labeled with paramagnetic microspheres (Ø 0.9 µm) and transplanted into the border zone of the infarcted myocardium. *In vivo* cell tracking and measurements of functional cardiac parameters were performed using a clinical 3T MRI-scanner with a dedicated magnification coil for mice.

Results: Microspheres were phagocytosed by mMSC efficiently, without interfering with their proliferation and differentiation potential. A minimum of 10,000 transplanted mMSC could be localized by MRI 5 days after transplantation. Sequential tracking of 100,000 labeled cells for 4 weeks showed local preservation of the signal, indicating that cells are retained at the site of injection. Compared to sham-controls, cell transplanted animals showed significant improvement of left ventricular ejection fraction (53.3 ± 3.4% versus 30.4 ± 2.2%; $P < .05$) 4 weeks postoperatively.

Conclusion: Intramyocardial transplantation of mesenchymal stem cells into infarcted hearts resulted in improvement of left ventricular function. In addition we could show that *in vivo* tracking of transplanted cells in small animal models is feasible using a clinical MRI set-up and opens new ways to elucidate the mechanisms of cardiac cell therapy.

OP107—ERYTHROPOIETIN PROTECTS SYSTOLIC BUT NOT DIASTOLIC FUNCTION OF NEONATAL HEARTS AGAINST ISCHEMIA/REPERFUSION INJURY

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Background: In adult hearts, the immediate protective effects of erythropoietin (EPO) against ischemia are well known. It was hypothesized that EPO has similar protective effects against ischemia/reperfusion when administered prior to ischemia induction in the neonatal heart.

Material and Methods: Systolic and diastolic indices and AKT and ERK pathways were studied in vivo using a neonatal pig heart model. Regional ischemia was induced for a period of 45 minutes by ligation of the left anterior descending artery (LAD), followed by 90 minutes of reperfusion. The treatments consisted of 3 groups:

1) EPO (1000 IU/kg, IV) 3 minutes prior to ischemia,
2) EPO (1000 IU/kg, IV) 24 hours before ischemia, and
3) untreated control (saline only).

Myocardial contractility indices were assessed by sonomicrometric crystals placed on the epicardial surface and a high fidelity catheter-tip pressure transducer inserted into the left ventricle. The AKT and ERK pathways were evaluated using Western blotting.

Results: It was found that elastance at 60 and 90 minutes of reperfusion was higher in the group receiving EPO 3 minutes prior to ischemia but not in the other 2 groups ($P = .01$). Preload recruitable stroke work was higher for both groups receiving EPO prior to ischemia; however, this was not observed in the control group ($P = .04$). The time constant of isovolumic relaxation (TAU) did not differ in the 3 groups after 90 minutes of reperfusion ($P = .29$). The end diastolic pressure volume relationship (EDPVR) behaved similarly in the 3 treatment groups. In addition, EPO enhanced phosphorylation of AKT but not ERK.

Conclusion: EPO provided a protective effect on neonatal systolic function during events of ischemia/reperfusion injury. However, this protective effect was not observed on diastolic function.

Furthermore, this protective effect was followed by activation of the AKT but not ERK pathway as previously reported from studies using mature myocardium.

OP108—BONE MARROW MONONUCLEAR CELL TRANSPLANTATION IMPROVES VASCULARIZATION AND CARDIAC FUNCTION IN LEFT-VENTRICULAR HYPERTROPHY

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Objectives: Cardiac cell therapy represents a promising treatment strategy for cardiovascular regeneration in non-ischemic cardiomyopathy. Paracrine factors from bone marrow stem cells show pro-angiogenic and anti-apoptotic effects on the myocardium, resulting in increased myocardial perfusion and preservation of ventricular function. Here, systemic bone marrow mononucleated cell (MNC) transplantation is investigated for its regenerative potential in a mouse model of myocardial hypertrophy.

Methods: Left-ventricular (LV) hypertrophy was induced by transverse aortic constriction (TAC) in NOD-scid mice. Human bone marrow was processed by Ficoll gradient centrifugation. The cell product was characterized by FACS analysis (CD34, CD45, CD133) and colony forming units (CFU). 1x10e6 MNC were transplanted intravenously 1 week post-TAC (n = 15). Cardiac-MRI assessment was performed weekly and included determination of LV volumes, LV wall-thickness, and LV ejection fraction. Capillary density was determined by quantitative immunohistochemistry (caveolin-1).

Results: Human bone marrow MNC for transplantation were verified by FACS analysis and differentiated into 12.3 ± 2.7 CFU per million cells. Human cells were detectable up 7 days posttransplantion by rt-PCR analysis. Capillary density assessment revealed reduced capillary-to-myocyte ratio in TAC animals, which was ameliorated by cell transplantation (2938 ± 483 [Sham]; 2187 ± 376 [TAC]; 2553 ± 334 [MNC, $P < .02$ versus TAC and Sham]). However, while onset of heart-failure was delayed, there was no change in LV-wall-thickness.

Conclusions: Bone marrow MNC transplantation induces proangiogenic effects non-ischemic cardiomyopathy with a significant delay of onset of heart-failure. These promising results can be easily translated into clinical application a may have a significant benefit for patients with non-ischemic heart-failure.

OP109—GLANDULAR STEM CELL DERIVED CARDIOMYOCYTES: DIFFERENTIATION AND HOMING

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Background: Applying stem cell therapy in a failing myocardium, stem cell transformation into cardio-myocytes, and intramyocardial cell homing is significant.

Methods: Male adult stem cells were harvested from pancreatic (parotic) and co-cultured with human myocardial biopsies from female patients (n = 6). A t.roponin-I-staining and a fluorescence in situ hybridization (FISH) were performed. In goats (n = 6) the intra-myocardial homing of glandular stem cells and MSCs ($CD133^+$) was evaluated. Glandular stem cells were characterized by red PKH26 and MSCs by green PKH67 makers. A mix of 1 million of each cell type was injected into 3 locations of the goat's myocardium of the left ventricle. Myocardial samples were harvested 6 weeks after injection (n = 6).

Results: We could show by simultaneously applied immunocytochemistry for troponin-I and FISH that human adult stem cells from pancreas and submandibularis with a positive immunocytochemistry for troponin-I differentiated into cardiomyocyte-like cells which were male (XY) likewise the glandular stem cells. After 6 weeks, within the frozen myocardial slices 98% of the marked stem cells were identified as GSCs (red) but less than 2% as green MSCs. ($P \leq .05$).

Conclusion: The differentiation of human adult pancreatic and sub-mandubular stem cells into cardio-myocyte like cells has been proven. Due to a more than 98% homing of glandular stem cells combined with the ability developing cardio-myocyte like cells, glandular stem cells might become a clinically relevant autologous source of regenerative tissue for the repair of irreversible damaged myocardium.

OP110—REPAIR OF EXPERIMENTALLY INFARCTED RABBIT MYOCARDIUM BY TRANSPLANTATION OF AUTOLOGOUS SKELETAL MUSCLE-DERIVED AKT-OVEREXPRESSING STEM CELLS

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Objectives: The heart muscle is terminally differentiated tissue: there are a small number of precursor, stem, or reserve cells. Because of the slow renewal, myocardium regeneration after infarction is insufficient. Cellular therapy is the possibility to restore the damaged tissue. However, up to 90% of the injected cells die within a few days after transplantation due to the toxic factors in lesion area. The aim of this study was to upgrade adult skeletal muscle-derived autologous myoblast viability by transfecting Akt gene and to evaluate genetically modified cell resistance *in vitro* and regenerative efficacy in the experimentally infarcted rabbit's heart.

Methods: For cardiomyoplasty, autologous skeletal muscle-derived stem cells were multiplied in the cell culture. Their viability and resistance was improved by using Akt gene transfection. Protein kinase Akt is known to be involved in cellular survival pathways. The resistance of Akt transfected and parental cells to model apoptotic inductors (doxorubicin, H_2O_2, and cisplatin) was estimated *in vitro*. To evaluate regenerative efficiency of genetic modification, parental and transfected cells were stained with PKH26 (red) or PKH67 (green) and both with DAPI vitalic dyes. A mixed population of both transfected and parental cells was

introduced into experimentally infarcted myocardium during the operation. The efficiency of transplantation was evaluated by myocardial functional performance and according the amount of integrated stained (green and red) cells in the rabbit's myocard following 2-6 weeks after transplantation.

Results: The Akt-overexpressing cells exhibited significantly enhanced resistance to apoptotic inductors *in vitro*. During the first month after cell transplantation, functional performance of myocardium improved and readily regenerated. Following 2-6 weeks, transfected cells prevailed in the experimentally infarcted myocardium after the mixed cells transplantation.

Conclusions: Autologous myogenic stem cells overexpressing Akt gene enhanced resistance and viability of grafted cells after intramyocardial injection in the experimentally injured rabbit's heart tissue.

OP111—EPITHELIAL-TO-MESENCHYMAL TRANSITION OF PLACENTA STEM CELLS ENHANCES THEIR CARDIAC REGENERATION CAPACITY

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Objective: Amnion epithelial cells (AEC) are a readily available cell source for potential use in regenerative medicine. Subpopulations of AEC may express embryonic stem cell markers such as SSEA-3/4, TRA1-60, TRA1-81, OCT-3/4, NANOG, and SOX-2 and display stem cell behaviour, but usually AEC behave like mature epithelial cells. We hypothesized that induced epithelial-to-mesenchymal transition (EMT) in AEC improves their capacity for cardiovascular regeneration.

Methods: Human AECs were derived from full-term placenta and expanded in customized media. EMT was induced by incubation with transforming growth factor-β (TGF-β). Cells were analysed for changes in cell morphology in vitro, including expression of N- and E-cadherin by immunofluorescence, FACS surface marker phenotype, and RNA expression profiling by microarray (Affymetrix HG-U133A chip). Migratory capacity was studied by scratch wound assay and in Transwell plates. In vivo, AEC were injected in infarcted myocardium after LAD ligation in wild-type mice. LV function was studied by MRI and echocardiography, and scar size was well as blood vessel density were measured by histology.

Results: Initially, AEC expressed stem cell markers but lost Oct-4 expression at higher passages and behaved like mature epithelial cells. In response to TGF-β, EMT-AEC acquired a fibroblastoid shape, associated with up-regulation of N-cadherin, down-regulation of E-cadherin, accelerated scratch wound closure, and Transwell migration. FACS analysis showed an increase in CD90 expression and a decrease in CD14 and HLA-DR expression. Microarray analysis revealed a change in gene expression consistent with down-regulation of epithelial characteristics. Preliminary analysis of in vivo data indicated that EMT-induced AEC are tolerated better in the immunocompetent xenotransplantation model and inhibit pathologic post-infarct remodelling processes.

Conclusion: Induced epithelial-to-mesenchymal transition of human amnion epithelial cells enhances their cardiac regeneration potential and may help optimize the usefulness of placenta-derived cell for cardiac cell therapy.

OP112—THROMBIN PROMOTES ANGIOGENESIS IN AN EXPERIMENTAL MODEL OF ACUTE MYOCARDIAL INFARCTION

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Objective: Thrombin has been reported to play a pivotal role in the initiation of angiogenesis by indirectly regulating and organizing a network of angiogenic molecules and protecting endothelial cells from apoptosis, resulting in vascular protection. Based on these reports, we investigated the angiogenic action of thrombin in a rabbit model of acute myocardial infarction.

Methods: A rabbit model of acute myocardial infarction was created by ligation of the left anterior descending coronary artery (LAD). Subjects were treated with an intramyocardial injection of either 2500 IU thrombin (group A; n = 8) or an equal volume of saline (group B; n = 8). After 4 weeks the animals were euthanized. ECG, cardiac enzyme, and assessment of cardiac function by measuring left ventricular end-diastolic pressure (LVEDP) were recorded before and after myocardial infarction and also before animal euthanasia. The hearts were excised, and histopathologic, immunohistochemical, and electron microscopy examination were performed.

Results: An increase of troponin, ST elevation, and histological confirmation of myocardial infarction were observed in all animals. In animals treated with thrombin, there was a significant increase in vascular density in the border zone 30.3 ± 12.8 (group A) versus 12.6 ± 4.8 (group B), ($P < .05$). Baseline LVEDP was similar in both groups (7.1 ± 1.7 mmHg in group A versus 6.7 ± 1.3 mmHg in group B) and was significantly increased in both groups after ligation (12.7 ± 2.2 mmHg in group A versus 12.2 ± 2.3 mmHg in group B). After the 4-week period, a significant reduction of LVEDP was observed in the thrombin-treated group compared with the control group (6.9 ± 1.8 mmHg versus 11.7 ± 1.7 mmHg, $P < .05$) that was attributed to improvement of cardiac performance.

Conclusion: Intramyocardial injection of thrombin promotes angiogenesis and may improve cardiac function in the ischemic myocardium, providing a potential new therapeutic approach in patients with acute myocardial infarction.

Adult Cardiac Surgery VII

WEDNESDAY, JUNE 15, 2011, 11:10 – 12:40 H

OP113—SURGICAL TREATMENT OF LEFT SIDED HEART TUMORS

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Objective: To analyse surgical treatment of left sided heart tumors (LSHT).

Methods: From 01 Jan 2001 to 01 Jan 2007, 426 patients (pts) with primary LSHT were operated on. Tumors were based at the left atrium (LA; n = 415 pts), left ventricle (LV; n = 11 pts). Malignant forms were in 10 (2.4%) pts: LA (n = 9), LV (n = 1). In other cases myxomas were marked in 416 (97.6%) pts: LA (406), LV (10). Mean age was 54.4 ± 6.4 years (range 8-78); 331 females (77.7%), 95 males (22.3%). In the majority of pts (98.2%) the bottom of the myxoma was based on any part of interatrial septum. In 287 (69.5%) pts myxoma was in capsule. Maternal basement was removed by wide resection of the interatrial septum (n = 259 pts) (group A) and without broad resection of the septum (n = 148 pts) (group B).

Results: During last 6 years hospital mortality (HM) in the group with LA tumors was 2.4% (205/5). HM for malignant tumors was 2.0% (10/2): LA (n = 9/2), LV (n =1/0); 7.9% for other forms (n = 416/33): LA (n = 406/31, 7.6%), LV (n = 10/2). The main reasons of HM were heart failure and brain damage because pts had entered to clinic with heart failure (as a rule, giant myxoma) and with previous episodes of emboli (absence of myxoma's capsule). At the late period 314 (93.8%) pts with myxomas were observed during 1-19 years after correction. There were 7 (1.9%) recurrences of myxoma (all LA). Four were successfully reoperated (all belonged to group B).

Conclusion: The late result of myxoma's correction should be successful in cases with broad resection of maternal bottom (interatrial septum) and replacement one with autopericardial patch.

OP114—CONTINUOUS SELECTIVE PULMONARY PERFUSION WITH NEUTROPHIL ELASTASE INHIBITOR, SIVELESTAT, AMELIORATES PULMONARY ISCHEMIA-REPERFUSION INJURY UNDER CARDIOPULMONARY BYPASS

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Objective: Pulmonary ischemia-reperfusion injury (PIRI) following cardiac surgery under cardiopulmonary bypass (CPB) remains important problem. The aim of this study was to evaluate protective effects against PIRI utilizing continuous selective pulmonary artery perfusion (PAP) with blood containing neutrophil elastase inhibitor, sivelestat.

Methods: Under CPB (34 ± 2 min) with cardiac arrest for 30 min, 9 dogs were randomly divided into following 3 groups: (I) no PAP, (II) PAP alone, and (III) PAP with systemic intravenous administration of sivelestat. PAP was established by perfusing warm oxygenated blood selectively through the main PA (10 mL/kg/min). The degree of PIRI was measured before and 3 hours after CPB.

Results: Three hours after CPB, alveolar-artery oxygen gradient ($A\text{-}aDO_2$), PaO_2/FIO_2, extravascular lung water (EVLW), and pulmonary vascular permeability index (PVPI) were better in group II and III than that in group I: 151 ± 26 and 69 ± 2 versus 443 ± 36 mmHg for $A\text{-}aDO_2$, 538 ± 28 and 608 ± 3 versus 234 ± 37 mmHg for PaO_2/FIO_2, 189 ± 7 and 210 ± 10 versus 292 ± 27 mL for EVLW, and 5.0 ± 0.1 and 3.6 ± 0.1 versus 5.6 ± 0.1 for PVPI ($P < .0001$, respectively). Blood concentration of polymorphonuclear neutrophil elastase in group II was lower than that in group I (20.1 ± 0.02 versus 21.1 ± 0.07 ng/mL, $P = .0027$). Furthermore, the elastase concentration in group III was lower than that in group II (19.0 ± 0.03 versus 20.1 ± 0.02 ng/mL, $P < .0001$). Histologically, pulmonary edema and inflammatory cell accumulation were observed only in group I. Although slight pulmonary edema was observed in group II, no significant change was observed in group III.

Conclusion: Continuous selective PAP by itself ameliorated PIRI following CPB. Simultaneous administration of sivelestat further ameliorated the PIRI.

OP115—DIFFERENT METHODS OF SURGICAL STRATEGY OF LEFT VENTRICLE ANEURYSM CORRECTION

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Objective: The purpose of this study is to present our experience in surgical treatment of the patients with left ventricle aneurysm using linear plasty, Dor, and overlapping method.

Methods: From 2000 to 2010 158 patients underwent coronary artery bypass grafting with resection and plasty of left ventricular aneurysm. In 103 operations CABG with aneurysm correction were performed.

Results: Linear plasty was performed in 71 (44.9%) patients, 25 with correction of mitral valve insufficiency. Four (5.6%) patients died, 2 of them with mitral valve correction. Dor method was performed in 28 (17.7%) patients, 8 with mitral valve correction. One (3.6%) patient died with valve correction. In 59 (31.9%) patients aneurysm was resected with the following duplication formation when free lateral left ventricular wall sutured to interventricular septum and overlapping with another margin, 22 with mitral valve correction. Two (3.4%) patients died, 1 with valve correction. In 74 patients from all groups papillary muscle plication was performed with mortality 1.4%. In all patients mean ejection fraction increased from 32.2% ± 8.5% to 43.5% ± 5.4% ($P < .05$). Mean left ventricle diastolic size decreased from 60.7 ± 6.6 mm to 58.2 ± 4.4 mm ($P < .05$), systolic from 44.3 ± 4.3 mm to 40.2 ± 3.8 mm ($P < .05$). Mean left ventricle diastolic volume

decreased from 232 ± 36 mL to 166.3 ± 28 mL, systolic from 120 ± 18 mL to 80 ± 12 mL ($P < .05$). Counterpulsation was needed in 2 (2.8%) patients from 1 group, 7 (11.9%) from 2 group, and 0 (0%) in 3 group.

Conclusions: Overlapping and Dor methods of left ventricle aneurysm correction is the most safe method in patients with severely complicated ischemic heart disease. Papillary muscle plication provides good results and should be used whenever it possible.

OP116—ENDOCARDECTOMY FOR TREATMENT VENTRICULAR TACHYCARDIA BY PATIENTS WITH LV ANEURISM

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Ventricular tachycardia causes lethal outcomes in 50% of the patients with remodeled left ventricle after myocardial infarction.

Methods: Forty-five patients with postinfarction LV aneurisms were enrolled into the study. Diagnosis was based on the data of EchoCG, coronarography, and MRI. Electrophysiological study (EPhS) and CARTO-XP reconstruction of LV were performed for every patient. In all the patients zones of an electric scar and zones of low electrical potential (up to 0.5 mV) were revealed. Poor conduction and double potential able to trigger re-entry were registered by the electrogram. During the EPhS study radiofrequent markers were mapped along the problem zones borders. The patients were subjected to LVR with resection of endocardium mapped with radiofrequent markers. In the control group (n = 100) LVR was performed without endocardectomy. CABG was performed in all the patients.

Results: In the early postoperative period EPhS showed improvement in all the patients: zones of electrical scar could be noticed only in the area of endoventricular patch, zones of low potential disappeared at all, transient zones (from 0.5 to 1.5mV) took a limited space without ability to manifest re-entry and induce VT. In the late postoperative period (12 months) survival rate was 100%. Re-entry and induced VT zones remained in the control group patients. After LVR cardioverters-defibrillators were implanted in 3 patients, and the annual survival rate was 92% in the control group.

Conclusions: Resection of endocardium of LV scar tissue is an essential part of LVR with postinfarction heart aneurisms for prevention of ventricular tachycardia.

OP117—INITIAL EXPERIENCE AND RESULTS OF AF ABLATION STRATEGIES WITH THREE DIFFERENT ENERGY SOURCES AND THREE DIFFERENT LESION SETS

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Introduction: Atrial fibrillation (AF) is a health hazard because of the associated morbidity and reduced life expectancy. Conversion to stable sinus rhythm can result in better outcomes than rate control alone. Whilst surgical CoxMaze is the gold standard for AF ablation, complexity of this procedure has encouraged the development of modified lesion sets by alternative energy sources. We report our experience with AF ablation performed by 3 different energy sources and 3 different lesion sets.

Methods: Retrospective review of 90 patients undergoing AF ablation during open heart surgery at our institution between April 2004 and January 2010, and followed up till April 2010.

Results: Three different energy sources were used: radiofrequency (RF, 67.8%), microwave (14.4%), and high frequency ultrasound (HIFU, 17.8%). Concomitant mitral surgery was performed in 41 (45.5%) and coronary revascularization in 34 patients (37.8%). Microwave and HIFU were used only in revascularization, while RF ablation was used predominantly in mitral surgery.

Pulmonary vein isolation was performed in 63.5% of patients, with an additional left atrial lesion set in 17.7% and bi-atrial lesion set in 18.8%. Left and right atrial sets were almost exclusively performed with RF catheters.

There were 5 peri-operative deaths (5.5%). Amongst survivors, 61 (71.6%) were discharged in sinus rhythm, 20 (23.5%) in AF, and 4 patients (4.7%) needed permanent pacemakers. At an average follow-up of 136 ± 185 days, a total of 56 patients (67%) were in sinus rhythm with conversion rate breakdown for left atrial lesion set, bi-atrial lesion set, and pulmonary vein isolation of 88.9%, 71.4%, and 65.5%, respectively.

Conclusions: AF ablation can be performed effectively with different energy sources in selected patients. Successful ablation was more influenced by the lesion set than by energy source used. Follow-up of patients is imperative to record failure of ablation so that management of residual AF is optimized.

OP118—EXPERIENCE WITH A LOW RESISTANCE NANO-STRUCTURED CERAMIC BEAD MATRIX BASED ARTERIAL LINE FILTER FOR ADSORBING CYTOKINES IN A PORCINE MODEL OF CARDIOPULMONARY BYPASS

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Objectives: Cardiopulmonary bypass (CPB) is linked to a systemic inflammatory response, and the specific targeting of mediating cytokines has the therapeutic potential to reduce this inflammatory response. The objective of this study was to test a filtration device based on a nano-structured ceramic bead matrix for cytokine adsorption under near-clinical conditions in a pig model of CPB.

Methods: The filter device was positioned in the arterial line of the CPB circuit. Two experimental groups were used: ceramic bead matrix and control, using a blank matrix without the beads. Yorkshire swine were anesthetized, intubated, ventilated, and heparinised. The animal was placed on CPB, with a total bypass time of 60 minutes. Weaning from CPB was followed by a 4 hour period of recovery, then euthanasia and organ harvesting. Blood samples were taken throughout the experiment, and plasma levels of cytokines IL-6, TNFα, and IL-10 were measured. Delta dry tissue weights were analysed as a marker of edema.

Results: The cytokine profile in the control animals reflected normal clinical experience, with a rise in IL-6 and TNFα levels from baseline to termination of the experimental procedure. The

profile in the filtered group was somewhat different, with no significant rise in IL-6 or TNFα during the period of CPB ($P > .1$), but a rise in both markers was detected between termination of CPB and the end of the experiment 4 hours later. Analysis of delta dry tissue weights indicated reduced edema after CPB in the filtered group when compared to the control, especially in brain and lung tissues ($P < .05$).

Conclusions: The filtration device reduced TNFα and IL-6 to near-baseline levels during the period of CPB, but may only delay the cytokine-mediated element of the inflammatory process. Despite this, there was a significant reduction in tissue edema, a common marker of CPB inflammatory injury.

OP119—TRACHEOSTOMY IS NOT A RISK FACTOR FOR DEEP STERNAL WOUND INFECTION IN CARDIAC SURGERY PATIENTS

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Background: Previous studies on predictors of deep sternal wound infection (DSWI) have identified either respiratory failure (RF) or tracheostomy as a risk factor for the occurrence of this complication. However, most of them have not determined the interaction between these 2 variables. We hypothesize that RF and not tracheostomy per se is associated with an increased risk of DSWI.

Methods: We retrospectively analyzed 2976 consecutive patients (mean age 68.2 ± 11.1 years, 29% female) undergoing cardiac surgery through median sternotomy between Jan. 2009 and Mar. 2011. Patients were stratified according to the occurrence of RF and the need for tracheostomy as follows: RF with tracheostomy; RF without tracheostomy; no RF. Primary outcome measure was the incidence of DSWI in each group and its predictors.

Results: Postoperative RF was observed in 199 (6.7%) patients. Out of these, 48% (n = 97) underwent tracheostomy. DSWI occurred in 82 (2.8%) patients (no-RF group: 2.3%; RF group: 8.5%, $P < .001$). Among the RF group, the incidence of DSWI was similar between tracheostomy (7.2%) and non-tracheostomy patients (9.2%, $P = .615$). In multivariate analysis, RF was the strongest predictor of DSWI (odds ratio = 3.9, 95% confidence interval 2.3–6.8, $P < .001$), whereas tracheostomy itself was not identified as a predictor of DSWI.

Conclusion: The incidence of DSWI remains high in patients with respiratory failure following cardiac surgery. Our data shows that tracheostomy is not a risk factor for DSWI and serves as a surrogate for RF. Therefore, considering that early tracheostomy may be beneficial in patients with respiratory insufficiency, a more liberal approach to early tracheostomy may be warranted.

Basic Science III

WEDNESDAY, JUNE 15, 2011, 11:10 – 12:40 H

OP120—ROLE OF CD8+ T-CELLS IN ACUTE LUNG ALLOGRAFT REJECTION IN MICE

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Background: Despite contemporary immune suppression protocols, acute allograft rejection continues to present a major obstacle to successful lung transplantation. We previously showed that in contrast to other solid organs, acute allograft rejection of lungs is independent of CD4+ T-cell allorecongnition pathways. In this study we aimed to investigate the role of CD8+ T-cells that were predominantly found in rejected lungs.

Methods: Lung allografts from C57BL/6 were transplanted orthotopically into fully MHC-mismatched BALB/c (H-2^d) recipients. Recipients received anti-CD 4mAb or anti-CD8 mAb (100µg i.p., d-2, d-1, d0). Depletion was confirmed by FACS analysis of blood, spleen, and allograft. In the syngeneic group, C57BL/6 grafts were transplanted into C57BL/6 recipients. Rejection was confirmed by direct visualization after thoracotomy. At day 7 posttransplantation, grafts were examined by immunohistology and flow-cytometry. Titers of immunoglobulin were measured by flow cytometry at different time points in recipient groups.

Results: In contrast to syngeneic grafts, which revealed normal appearance at day 7, allografts displayed severe acute rejection with extensive perivascular and interstitial infiltrates of mononuclear cells. CD4+ depleted recipients rejected their grafts at the same time as the untreated recipients. In the untreated recipients, the percentage of infiltration of CD8+ T-cells was significantly superior to that of CD4+ T-cells. However, CD8+ depleted recipients displayed no enhancement of graft survival compared to WT controls recipients.

Conclusion: This is the first report analysing the effect of CD8+ lymphocytes in an orthotopic lung transplantation model in mice. Our findings indicate that the tempo of acute rejection is not altering in absence of CD8+ T-cells.

OP121—COMPARISON BETWEEN LUNGS PRESERVED FOR 6 AND 12 HOURS USING CELSIOR OR PERFADEX IN AN EX-VIVO PERFUSION RAT LUNG MODEL

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Introduction: Ischemia-reperfusion injury remains a major cause of early morbidity and mortality following lung transplantation.

Although its onset, prevalence, and severity are multifactorial, lung preservation strategies have a major impact on graft performance.

Objective: To evaluate early graft performance comparing preservation solutions using an ex-vivo rat lung perfusion model.

Methods: Sixty heart-lung blocks were harvested from Wistar rats were allocated randomly into 2 groups (6 and 12 hours cold ischemia at 4°C). Each group (n = 30) was then divided into 3 subgroups (n = 10), according to lung solution preservation (Perfadex, Celsior, normal saline). After ischemic time, lungs were placed in an ex-vivo lung perfusion apparatus (*IL2-Isolated Perfused Rat or Guinea Pig Lung System*, Harvard Apparatus) and reperfused for 60 minutes with homologous deoxigenated rat blood obtained from donor-rats. Ventilatory mechanics and gas exchange were measured at 10-minute intervals. Relative oxygenation capacity (ROC) was calculated using the formula ROC = $[(paO_2\text{-}pvO_2)\ x100/pvO_2]$. At the end of reperfusion, heart-lung blocs were weighed before and after being stored at 70°C for 72 hours to obtain the wet/dry lung ratio.

Results: There were no statistically significant differences in ROC between Celsior and Perfadex preserved lungs at 6 and 12 hours of ischemia. Pulmonary artery pressures were lower in the 6-hour lungs than in the 12-hour but showed no differences within groups. Pulmonary resistance was the lowest in Celsior lungs preserved for 6 hours ($P = .01$). Saline lungs performed poorly in regards to lung mechanics as expected. Wet-dry lung ratio was higher in all 12-hour lungs with no significant differences between the groups, whereas Perfadex lungs showed highest ratio in 12-hour lungs ($P < .0001$).

Conclusions: Rat lungs preserved with Celsior flush solution showed best oxygenation capacity, slightly better pulmonary mechanics and less edema compared to other solutions. All lungs performed poorly after 12 hours of cold ischemia in this rat model of ex-vivo lung perfusion.

OP122—CONTROLLED LUNG REPERFUSION FOR PREVENTION OF CPB-RELATED PULMONARY DYSFUNCTION AFTER CARDIAC SURGERY

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Purpose: Pulmonary dysfunction after routine cardiac surgery due to CPB-related ischemia/reperfusion (I/R) injury of the lungs is a considerable source for morbidity and mortality of patients. This pilot study tested the effects of controlled lung reperfusion on functional pulmonary parameters after CPB in pigs.

Methods: After sternotomy, pigs were subjected to routine CPB for 2 hours with 1 hour of cardiac arrest using blood cardioplegia. Following ischemia, control animals (n = 5) were conventionally weaned from CPB. In the controlled reperfusion group (n = 6) lung reperfusion through the pulmonary artery was initiated with modified blood reperfusion (n = 6; blood-crystalloid composition: hypocalcemic, hyperosmolar, pH 7.6, normoxic pO2 80-120 mmHg; perfusion pressure < 20 mmHg) for 15 minutes before weaning from CPB. Three sham-operated pigs served as controls (no CPB, open-chest). Pulmonary vascular (PVR, PAP) and functional parameters (PaO2/FiO2, AaDO2 ratio, peak inspiratory pressure [Pmax], pulmonary Qs/Qt, lung compliance) were assessed before surgery, after weaning from CPB and 4 hours after surgery.

Results: Parameters of pulmonary function remained unchanged in sham-operated animals throughout the study protocol. In contrast, CPB resulted in increased Pmax, pulmonary Qs/Qt and reduced lung compliance at 4 hours after CPB ($P < .05$ versus preCPB). Controlled lung reperfusion with unmodified or modified blood failed to preserve pulmonary function with increases in Pmax, pulmonary Qs/Qt, pulmonary artery pressure, and deterioration of lung compliance at 4 hours after CPB in comparison to CPB without lung reperfusion. No differences were detectable with regard to postoperative pulmonary function among reperfusion groups.

Conclusion: Ischemia/reperfusion injury of the lungs during cardiac surgery with CPB results in postoperative deterioration of pulmonary function. In contrast to myocardial I/R injury, controlled reperfusion of the lung fails to offer protection concerning early postoperative lung function suggesting the need for additional strategies.

OP123—INHIBITORY EFFECT OF PHOTODYNAMIC THERAPY ON VEIN GRAFT RESTENOSIS IN RABBITS

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Objective: To investigate the inhibitory effect of photodynamic therapy (PDT) on anastomotic vein graft intima hyperplasia (IH) with hematoporphyrin monomethyl ether (HMME) perfused intraluminally and locally before the extravascular irradiation.

Methods: Reversed external jugular vein bypass grafts of the common carotid artery were performed in 16 male New Zealand rabbits, and 32 anastomoses were divided into 4 groups according to different treatments: controlled group, saline treatment; HMME group, only given HMME, locally; laser irradiation group, only given laser light illumination extravascularly; PDT group, the vein grafts were perfused with HMME (15 μg/mL) intraluminally and locally before the extravascular irradiation with 30 joule/cm^2 at 532 nm. All vein grafts were perfusion fixed with formaldehyde solution at 4 weeks. Histology and morphometric analysis of 3 parts of the anastomosis, which was consisited of arterial part, the veno-arterial junction, and venous part, were performed. Using IMAGE-Pro Plus biomedicine image analysis system (Version 4.5.0.19) and Student-Newman-Keuls Test for pct, it could be seen that percent of stenoses in all 3 parts were significantly less in PDT group compared with those in the nonphotooxidized 3 groups.

Results: Percentage of stenoses in all 3 parts of the PDT group were significantly less compared with those in the nonphotooxidized 3 groups. Photosensitizer infusion group has inhibitory effect on intima hyperplasia in arterial and venous end. Laser group only have a certain effect in the venous end.

Conclusions: These data suggest that HMME-induced photooxidation of vein grafts may suppresses the development of IH especially in the early stage.

Keywords: Photodynamic therapy, Vein graft, Restenosis

OP124—ALTERATION OF MYOCARDIAL OXIDATIVE STRESS PATTERNED BY OBESITY IN PATIENTS UNDERGOING CORONARY ARTERY BYPASS GRAFTING

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Objectives: Myocardial contractility is impaired in myocardium from patients with increased body mass index (BMI). Animal studies point toward relevant compensatory mechanisms in cardiovascular disease states due to altered expression of antioxidative enzymes, i.e., mitochondrial aldehyde-dehydroxygenase (ALDH2), endothelial NO-synthase (eNOS), and the tetrahydrobiopterin (BH4)-synthesizing enzyme dihydrofolate reductase (DHFR).

Methods: From 61 subsequent CABG patients we harvested excessive, right atrial myocardial tissue emerging from operative connection to extracorporeal circulation. Patients were assigned to either the 'Control' (n = 19, normal BMI), the 'Obesity' (n = 25, BMI > 26 for men, >25 for women), or the 'Adiposity' (n = 17, BMI > 30) group. In myocardial tissue we looked for altered protein expression of antioxidative enzymes by Western or Dot blotting. Mean values derived from Control group were defined as 100% expression. Superoxide concentrations and functional enzymes as ALDH2, eNOS, and DHFR were measured.

Results: In the myocardium of obese patients, superoxide levels were increased to > 120% expression of Control. Resulting in functional enzymatic changes: not only the ALDH2 was significantly attenuated in the 'Adiposity' group (75% versus Control, $P = .002$), but also the DHFR stated fewer expression in the 'Obesity' (74% versus Control, $P = .018$) and in the 'Adiposity' group (63% versus Control, $P = .004$). There was currently no group difference in expression of eNOS.

Conclusions: Myocardium from obese patients undergoing CABG displays modulated expression of oxidative stress sensitive enzymes. Elevated superoxide levels as well as attenuated expression of ALDH2 and DHFR are suggestive for an increased myocardial oxidative stress in obese patients. These data contribute to an explanation of impaired myocardial contractility in patients with increased BMI.

OP125—LINEAGE CONVERSION OF SKELETAL MUSCLE DERIVED PRECURSOR CELLS INTO CARDIOMYOCYTES—A PROMISING AUTOLOGOUS CELL SOURCE FOR CARDIAC CELL THERAPY

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Objectives: Cardiac cell transplantation is a promising approach for cardiac regeneration in heart failure patients. However, the ideal cell source has not been found yet. In the presented work we induced a lineage conversion of skeletal muscle derived precursors into cardiomyocytes avoiding gene manipulation, which can be easily translated into a clinical application.

Methods: Skeletal precursor cells were isolated from adult C57/BL6 mice. Following a primary expansion and purification according to a skeletal myoblast isolation protocol, the cell product was further cultured under hanging drop culture conditions. The forming cell clusters were characterized by immunohistochemistry and single cell patch-clamping.

Results: Under hanging drop culture conditions the purified cells showed a high lineage conversion rate toward cardiomyocyte-like phenotype. Besides synchronous beating of the clusters, these cells were highly positive for cardiac troponin, connexin 43, cardiac myosin heavy-chain. Electrophysiological assessment under 8 Hz stimulation showed cardiomyocyte-like shape of the action-potentials.

Conclusions: Despite an ongoing controversial discussion about skeletal precursor cells ass a cell source for cardiac cell therapy, we confirmed successful lineage conversion of those cells into a cardiomyocyte-like phenotype. This provides an outstanding alternative cell source for cardiac cell therapy which can be easily translated into a clinical application.

OP126—SPHINGOSINE-1-PHOSPHATE INDUCES CONTRACTION OF AORTIC VALVE INTERSTITIAL CELLS VIA RECEPTOR S1P2 AND RHOA SIGNALING

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Objectives: Sphingosine-1-phosphate (S1P) has emerged as a potent bioactive lipid with multiple functions in cardiovascular pathophysiology. Potential roles of S1P in heart valve diseases and the expression of the relevant receptors (S1P1, S1P2, or S1P3) in valve tissue is currently unknown. This investigation aims at characterizing S1P effects on valvular interstitial cells (VICs) in terms of contraction in vitro/in situ and S1P-induced signaling.

Methods: VICs from porcine aortic valves were subcultured on collagen-coated polystyrene. Contraction of confluent cells into nodules was induced by S1P in the presence of various inhibitors of S1P receptors and signaling pathways after transfer to non-coated polystyrene. RhoA activation was measured using an Elisa-type test kit. Free cytoplasmic calcium ($Ca^{2+}i$) was analyzed by loading cells with a fluorescent indicator dye (Fluo8). Contraction force of excised valve strips was detected in Tyrode's solution.

Results: Treatment of VICs with S1P in the range of plasma concentrations (0.06-1 µM) resulted in contraction and nodule formation. Contraction was completely blocked by JTE-013, a specific inhibitor of S1P2, whereas inhibitors of S1P1 and S1P3 were without effect or slightly activating. The S1P-induced contraction was blocked by inhibition of RhoA and Rho kinase but not by inhibitors for other pathways of S1P signaling, and RhoA was activated after S1P treatment. Exposure to S1P induced an instantaneous and rapidly reversible increase of $Ca^{2+}i$. However, resistance to JTE-013 inhibition, different kinetics as well as concentration range, excludes a major role of $Ca^{2+}i$ in S1P-dependent VIC contraction. The S1P-induced contraction of tissue slices was of a similar force as observed with another well known effector, epinephrine. The effect was fully reversed with JTE-013.

Conclusions: S1P induced contraction of VIC from porcine aortic valves by signaling via S1P2, RhoA, and ROCK. In this way, S1P contributes to the regulation of tissue tension in aortic valves.

OP127—SPRAYED VERSUS LASER-ASSISTED BIOMATERIAL PROCESSING—ADVANCED TECHNOLOGIES FOR DIRECT AUTOLOGOUS CARDIOVASCULAR GRAFT TISSUE ENGINEERING

Klopsch, C.,[1,2] Gaebel, R.,[1] Kaminski, A.,[1,2] Mark, P.,[1] Koch, L.,[3] Chichkov, B.,[3] Jockenhoevel, S.,[4] Ma, N.,[1] Steinhoff, G.[1,2]

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Objectives: The creation of cardiovascular prostheses with optimal host acceptance and engraftment is highly appreciated. We aimed at autologous stem cell plus fibrin-based tissue-engineering (TE) of biologic valvular xenografts and artificial bioresorbable heart valves conceivably performed directly peri-operative or peri-interventional. Herein, we describe 2 advanced techniques: the sprayed bioprocessing (SBP) and the laser-assisted bioprinting (LaBP).

Methods: Human CD133+ stem cells ($CD133^+$-SC), mesenchymal stem cells (MSC), endothelial cells (EC), plasma, and fibrin were isolated. Decellularized porcine pulmonary cryo-valves and artificially-generated leaflet tissue-equivalents of bioresorbable polycaprolactone (PCL) were tissue-engineered at all surfaces. For SBP, purified cells or cell mixtures together with fibrin were simultaneously spray-administered in an airbrush fashion employing the novel *Vivostat Co-Delivery System*. For LaBP, MSC, and EC together with plasma were separately laser-printed in stripes and stabilized by hyaluronic acid, thrombin, factor XIII, and fibrin-sealing. In-vitro static cultivation was monitored about 20 days after delivery. For dynamic testing biologic and artificial valve prostheses were transferred to a bioreactor and put under pulsatile flow conditions for 2 weeks monitored by ultrasonic imaging. Fluorescent cell-labeling, immunohistochemistry and confocal microscopy analyses were occupied studying cell survival, proliferation and differentiation.

Results: Static cultivation displayed survival, proliferation, and engraftment of stem cells and EC on xenografts and PCL valves. Endothelial differentiation and the development of capillary-like tubuli and network systems were found after both LaBP and SBP of EC and MSC. Dynamic testing demonstrated sufficient performance of xenografts and PCL-valves following implantation into a bioreactor. However, further development of biomaterials and stabilization of graft-coating is required.

Conclusions: Human $CD133^+$-SC, MSC, EC, and fibrin can be isolated during cardiovascular interventions and surgeries. Direct autologous TE of biologic and artificial valve prostheses promises cost-effective and rapid improvement of in-vivo integration. Whether superiority of LaBP or SBP exists for valvular TE requires further investigation.

OP128—TITANIUM COATING OF GLUTARALDEHYDE-FIXED HEART VALVE PROSTHESES ENABLES A REDUCED IMMUNE RESPONSE AND A SELF-SEEDING WITHIN CIRCULATION

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Objectives: Glutaraldehyde (GA) fixation of biologic heart valve prostheses induces remarkable immunologic reactions, and valve toxicity prevents endothelialization of the blood contacting surface. Immune response with secondary dystrophic calcification may be why GA-fixed xenograft valves fail, especially in young patients. Detoxification and titanization may reduce immunologic reactions and enable a self-endothelialization within circulation.

Methods: GA-fixed heart valve prostheses and platelets of GA-fixed bovine pericardium were coated with electron-pair bound titanium in a plasma chamber under 35°C and additionally detoxified aldehyde-dehydrogenase (ALDH). Platelets of titanium coated, GA-fixed bovine pericardium were brought into an immunologic test setting inducing a complement-mediated granulocyte adhesion and activation. Titanium coating was applied to a porcine heart valve being implanted hetero-topic in a goat aorta for 6 months.

Results: Toxicity of pericardium was reduced by combination of procedures using ALDH and plasma-titanium coating (n = 12) to 17.3 ± 2.1% ($p \leq .01$). Titanium coated GA-fixed bovine pericardium versus GA-fixed bovine pericardium showed remarkable less complement-mediated granulocyte adhesion and activation (6%, $P < .05$). Detoxified and titanized GA-fixed pericardium covered with a confluent layer of endothelium. A porcine aortic heart valve, detoxified and titanized and implanted in the goat aorta for 6 months, histologically showed valve leaflets with recellularization. Immune-histochemic staining against factor VIII indicated a complete endothelialzation of valve's blood contacting surface.

Conclusions: Titanium coating in GA-fixed heart valve prostheses diminished immunologic reactions remarkably and enabled the first self-endothelialization of a GA-fixed heart valve. These preferences of titanium coating may improve valve durability.

General Thoracic Surgery III

WEDNESDAY, JUNE 15, 2011, 14:40 – 16:50 H

OP129—IMPACT OF SURGICAL RESECTION ON QUALITY OF LIFE, RESPIRATORY AND EXERCISE CAPACITY IN PATIENTS WITH BRONCHIECTASIS

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Introduction: Bronchiectasis is related to repetitive pulmonary infections leading to losses in pulmonary function, chronic morbidity, and social limitation. Clinical treatment failure is the main indication for surgery, but the effects of surgical treatment in quality of life and functional capacity are not fully studied.

Purpose: To determine the short- and long-term impact of surgical treatment in quality of life and respiratory and exercise capacity in patients with bronchiectasis.

Methods: Patients with symptomatic cystic bronchiectasis in high resolution computed tomography had evaluated their respiratory and exercise capacity (pulmonary function and incremental cardiopulmonary exercise tests [CPET]) and assessed quality of life (SF36 and WHOQOL-Bref questionnaires) before and 3 and 9 months after surgery.

Results: Eighteen patients (12 males) with 40 ± 12 years completed the follow-up. Several surgical procedures were performed: pneumonectomy (24%), lobectomy (70%), and bilobectomy (6%). In hospital period was 8.1 ± 3.2 days. One patient died due to respiratory insufficiency, and no other significant complication was observed postoperatively. Significant decreases in FVC (3.0 ± 0.6 to 2.5 ± 0.5 L) and FEV1 (2.1 ± 0.6 to 1.7 ± 0.5 L) were observed at third month, and only FEV1 recovered to baseline at ninth month. CPET showed significant losses in VO2 peak (20.3 ± 4.3 to 18.4 ± 4.5 mL/Kg/min), maximal minute ventilation (52.4 ± 15.6 to 45.7 ± 12.4 L/min) and maximal tidal volume (1.2 ± 0.3 to 1.1 ± 0.1 L) at third month, but all the measures completely recovered at ninth. Both questionnaires confirmed significant improvements in general and mental health domains ($P < .05$) and physical domain ($P < .001$). These benefits were observed at third month after surgery and maintained at ninth.

Conclusion: Although surgical resection of bronchiectasis diminish initially the respiratory and exercise capacity, they were restored at ninth month. More importantly, these interventions resulted in an important improvement in quality of life of such patients.

OP130—EFFICACY OF INTRAPLEURAL INSTILLATION OF TRANEXAMIC ACID FOR THE CONTROL OF POSTOPERATIVE BLEEDING FOLLOWING PULMONARY RESECTIONS FOR CHRONIC INFLAMMATORY PULMONARY DISEASES. A RANDOMIZED CLINICAL TRIAL

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Introduction: Postoperative micro vascular bleeding following pulmonary resections is adding considerable morbidity and increases the need for more blood transfusion. We aim to study the effectiveness of intrapleural instillation of tranexamic acid (TA) to control postoperative bleeding in patients undergoing various types of pulmonary resections for chronic inflammatory pulmonary diseases (CIPD).

Methods: Forty consecutive adult patients with CIPD (patients with bleeding diathesis excluded) scheduled for various types of pulmonary resection ranging from wedge resection to pneumonectomy were assigned randomly to receive either intrapleural instillation of TA (1 g of drug mixed with 100 mL of normal saline [Group1]) or 100 mL of normal saline alone (Group 2) on closure of thoracotomy wound after adequate control of obvious bleeding cut vessels. A minimum contact time of 1 hour kept before allowing for chest drainage. Complete blood counts and bleeding and clotting times were done pre- and postoperatively. Postoperative blood loss and blood transfusion requirements were compared.

Results: Significant postoperative bleeding was noted in group 2 when compared with group 1. The mean total blood loss was 226 mL ± 168 mL in group 1 and 538 mL ± 292 mL in group 2 ($P < .001$). Blood transfusion requirement was lower in group 1 (20%) when compared to group 2 (60%) (Odds ratio = 0.1667). No thrombotic events noted.

Limitations of our study:

1. Only a small volume of patients was studied, and a large volume for meta-analysis is needed.
2. Lack of multicenter study in CIPD patients for comparison.

Conclusion: Our short-term study results showed intrapleural instillation of TA is beneficial to reduce the postoperative bleeding and blood transfusion requirements in patients undergoing pulmonary resections for CIPD. Moreover, the use of TA didn't increase thrombotic complications.

OP131—EMERGENCY LUNG RESECTION FOR MASSIVE HAEMOPTYSIS STRATEGIES AND OUTCOME

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Objective: Retrospective analysis of emergency lung resection for massive haemoptysis to identify causes and clinical presentation in relation to immediate and long term outcome.

Materials and Methods: Eight-year retrospective study from the department of cardiothoracic surgery, PSG IMS&R from April 2001 to April 2009. Patients included in the study presented with massive haemoptysis with underlying parenchymal lung disease which was not suitable for

therapeutic bronchial artery embolisation (TBAE). Total number = 26; male:female = 23:3; age 32-75 (average 40 years). Those who underwent preoperative bronchial artery embolism or who had bilateral disease or haemoptysis with malignant etiology were excluded from the study.

Results: Two cases required re-exploration for excessive chest wall bleeding. Immediate postoperative lung expansion was satisfactory in all the cases. Minimal surgical wound sepsis developed in 4 cases. Two cases were re-hospitalized for significant recurrent bleeding from new sources. One from a bronchial stump granuloma and another one from a new lesion. Minor bronchial pleural fistula (BPF) developed in 2 cases and major BPF in 3. All were conservatively managed. There were no mortalities.

Histopathology of resected specimens confirmed aspergilloma in 12 cases, active tuberculosis in 3 cases, bullous with secondary infection in 1, fibro destroyed lung in 2, and necrotizing pneumonia lung abscess in 2 patients.

Conclusion:

1. Massive haemoptysis secondary to isolated lung lesions can be managed effectively with emergency surgical resection.
2. Lung isolation and conduction of surgery for emergency resection in the presence of active bleed in to the airway is technically demanding.
3. Specific therapy for aspergilloma and tuberculosis should be effectively initiated.
4. In our series the commonest cause for massive haemoptysis is post tuberculosis cavity with aspergilloma.
5. Postoperative nutritional support and chest physiotherapy is important for improving alveolar recruitment and respiratory reserve.

OP132—LUNG PARENCHYMA SPARING SURGERY—LASER RESECTION AND SLEEVE LOBECTOMY IN A RETROSPECTIVE REVIEW

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Objective: To asses our experience with lung parenchyma-sparing sleeve and laser resections in a retrospective study.

Methods: Between Jan. 2005 and Jan. 2011, 58 patients (42 males, 16 females, mean age 61 years, range 24-83 years) underwent sleeve lobectomy (SL) in our Institute. The indications for SL were non-small cell lung carcinoma (NSCLC) in 47, and pulmonary metastases in 11 patients. As the metastatic pulmonary lesions were multiple, the Laser Resection (LR) of these satellites was added to SL procedure. The main indication for LR were metastases of renal-cell (n = 4) and colorectal-carcinoma (n = 3). The most detected histologic type of NSCLC was squamous-cell carcinoma (n = 22), followed by adenocarcinoma (n = 14). The LR (combined by SL) was performed after fulfilling the standard criteria for metastasectomy: primary tumors were radically removed, and there was no evidence of any distant extrathoracic metastases. In 4 NSCLC patients the arterial sleeve was added to the left upper bronchial SL. Lymphadenectomy was routinely added to the both parenchyma-saving procedures.

Results: A negative bronchial (vascular) margin was achieved in all. The technique was R0 resection performed by interrupted suture with monofilament absorbable material for bronchial and monofilament non-absorbable for arterial anastomoses. All LR were performed by Nd:YAG Laser of 1318 nm wavelength. No 30-day postoperative mortality occurred. Follow-up (completed for all patients with median of 12 months) showed no anastomotic complications, no local recurrence on the bronchial (arterial) anastomosis.

Conclusion: Bronchial and vascular sleeve lobectomy can be performed safely and is a good alternative solution to avoid pneumonectomy. Selected patients with central lung metastases can be also included for this procedure after fulfilling the standard criteria for pulmonary metastasectomy.

OP133—ENDOBRONCHIAL DEBULKING FOR ADVANCED MALIGNANCY INVOLVING MAJOR AIRWAYS—SINGLE INSTITUTION EXPERIENCE

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Background: Endobronchial debulking can prolong life by managing life threatening symptoms and offer palliation from distressing respiratory symptoms in advanced malignant major airways obstruction. We present here a single centre experience with the procedure.

Methods: A retrospective review of 33 patients with 42 episodes of endobronchial debulking by coring, between March 2005 and September 2009. The patients were followed up till April 2010. The tumours were cored out and hemostasis achieved with adrenaline soaked pledgets. All procedures were recorded on video.

Results: Satisfactory patency of airways was achieved in all but 3 patients. Six patients needed postoperative intensive care support for an average of 3.66 days (range 1-7 days). There was 1 in hospital mortality (3.03%), and the median hospital stay was 1 day with 6 patients requiring hospital admission more than 5 days. Postoperative complication included atrial fibrillation in 3 and respiratory infections in 2 patients. Eleven patients have survived to April 2010 with an average symptom-free post procedure survival of 541 + 515 days. Six patients from this group went on to have adjuvant chemo/radiotherapy. The average survival of the remaining 21 patients was 174 + 200.93 days. Four patients needed repeat debulking at an average of 240.5 days between procedures.

Conclusions: Endobronchial debulking can be performed safely, with minimal risk and use of resources in patients with advanced malignancy and poor general condition. It offers a effective palliation and quality of life for survivors and also helps in improving respiratory fitness for a cohort of patients who could then proceed to have adjuvant chemo/ radio therapy.

OP134—RISK FACTORS IN ELDERLY PATIENTS AFTER LUNG RESECTION REQUIRING ICU HOSPITALISATION

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Elderly patients undergoing resection for lung cancer are thought to be at high risk for the development of postoperative

complications associated with significant morbidity and mortality. Routinely, they have been led to the Intensive Care Unit (ICU) postoperatively. Our objective was to identify whether ICU hospitalization influenced outcome and prognosis.

Material and Method: During a 3-year period 81 patients were subjected to resection for NSCLC, atypical resection, lobectomy, or pneumonectomy. There were 59 male (72.8%) and 22 female patients over the age of 75 years. Patients who needed mechanical ventilation directly after surgery or were submitted to intrapericardial pneumonectomy were excluded. Thirty patients (37%) were led to the ICU (Group A) for a mean of 2.8 days and the remaining 51 to the ward (Group B). Demographic data, type of operation, preoperative FEV1, cardiovascular disease, complications, in-hospital mortality, and cost were recorded and statistically analyzed.

Results: Overall in-hospital mortality was 6.1%, and minor or major complications occurred in 32 cases (39.5%). Only 5 patients (5/51, 9.8%) of group B required ICU admission due to complications within the first 48 hours.

Conclusions:

1. Only elderly patients at high cardiovascular risk or with preoperative FEV1 < 1 lt undergoing surgical resection need careful invasive postoperative monitoring.
2. Stable patients can be led directly to the ward without any influence on outcome or prognosis.
3. By identifying the patients needing ICU the cost of hospitalization can be reduced to 41% per patient.

OP135—IS COLORECTAL PULMONARY METASTATECTOMY WORTHWHILE?

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Objectives: It has recently been suggested by a leading UK thoracic surgeon that colorectal pulmonary metastatectomy should only be offered in the context of a randomised controlled trial (Treasure T, et al. When professional opinion is not enough. *BMJ*. 2007;334:831). We believe that this is not a majority view amongst thoracic surgeons and reviewed a single surgeon's experience with pulmonary metastatectomy over a 7-year period in order to demonstrate the effectiveness of the procedure.

Methods: A retrospective case note review of 18 patients undergoing colorectal pulmonary metastatectomy was performed. Demographic details along with the number of thoracic operations required and history of hepatectomy were recorded. Survival data were calculated from the date of the initial thoracic operation to the date of death or date of censoring (18 February 2011), whichever came first. Descriptive statistics were employed to analyse outcomes and the Kaplan-Meier method was used to report survival in the cohort.

Results: Between the years 2003 and 2010, 18 patients underwent colorectal pulmonary metastatectomy. In 13 patients (72%), the procedure involved resecting a single isolated deposit, whilst 5 (28%) required bilateral pulmonary resections for disease control. Eight patients (44%) underwent hepatic metastatectomy prior to pulmonary resection. The operative procedures comprised wedge resection (14), lobectomy (3), and pneumonectomy (1). There were no perioperative deaths. Data for 3- and 5-year survival were available for 14 and 5 patients, respectively, culminating in 3- and 5-year survival rates of 71% (10/14) and 60% (3/5), respectively. All 14 survivors remain disease free at follow-up.

Conclusion: Although these numbers are small they do indicate a highly satisfactory outcome for what is usually a minor thoracic surgical operation. We believe patients should be given the option of pulmonary metastatectomy when operable colorectal metastases are present whether within a randomised controlled trial or not.

OP136—THE LARGEST SINGLE INSTITUTIONAL SERIES TO DATE OF VIDEO ASSISTED THORACOSCOPIC (VATS) SEGMENTECTOMY; A VIABLE ALTERNATIVE TO LOBECTOMY

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Background: Currently, segmentectomy performed via an open thoracotomy is a proven and accepted oncologic procedure for patients with reduced cardiopulmonary reserve and significant comorbidities. Given that VATS is an accepted approach for lobectomy, our objective was to demonstrate the feasibility and safety of a minimally invasive thoracoscopic (VATS) approach to segmentectomy.

Methods: A retrospective review of a single center experience of all anatomic sub-lobar resections performed.

Results: The 149 VATS segmentectomies were performed over a 12 year experience between 1998 and 2010. Average age was 71.8 years old, 87 female, 62 male. Mean hospital stay was 4 days. Diagnoses included primary lung cancer (124, 83%, 90% stage 1), benign disease (16, 11%), and metastatic disease (9, 6%)

Anatomic segments resected: 73 Left upper lobe (LUL) Trisegments; 50 Superior Segments; 8 LUL Lingula; 5 Basilar, 5 Posterior single segment; 4 Anterior Single segment; 2 Apical Segment; 1 Left lower lobe Basilar Posterior & Lateral; 1 Right lower lobe Basilar Anterior & Medial

All complications were included. Overall, 34% had a minor complication: such as temporary mental status changes, subcutaneous emphysema, urinary retention, discharge home on oxygen. Eight percent of patients had a major complication, including 8 (5.4%) atrial fibrillation, 2 (1.3%) empyema, both in patients with infectious lung disease, 1 (0.7%) blood transfusion and conversion to open 1 (0.7%). There was one death (0.7%) due to pulmonary embolism.

Conclusions: We conclude that segmentectomy can be safely performed by VATS with low morbidity and mortality and are comparable to open segmentectomies and VATS lobectomies based upon published literature. This finding provides the surgeon with another tool in the treatment of early stage lung cancer.

OP137—INCLUSION OF OCTOGENARIANS AT THE BEGINNING OF VIDEO-ASSISTED THORACIC SURGERY LOBECTOMY PROGRAMME: IS IT SAFE?

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Objectives: To investigate the safety of including patients ≥80 years of age at the start of a Video Assisted Thoracic Surgery Major Pulmonary Resection (VMPR) programme.

Methods: Patients were accepted for VMPR if the CT/PET was suggestive of T1-3, N0-1, and M0 lesion. Age was not a criterion for exclusion. Data were collected prospectively, and comparison was made between 2 groups (A) < 80 years of age and (B) ≥ 80 years in terms of preoperative risk factors, oncological and functional data, operative results, postoperative complications and survival.

Results: Between April 2005 and January 2011, 200 consecutive patients were considered for VMPR. One hundred sixty had NSCLC, of whom 136 were in group A, with a median age of 66.5 years (range 42.8-79.4) and 24 in Group B with a median age of 82 years (range 80-85.5). Three (12.5%) patients in group B were converted to thoracotomy, compared to 17 (12.5%) in group A, (P = .65). There was no difference in mean hospital stay between the 2 groups (group B 5.8 ± 3.3 versus 5.9 ± 4.6 days in group A, P = .899), and no difference in occurrence of at least 1 postoperative surgical or non-surgical event (group B 15 [62.5%] and 12 [50%], group A 73 [53.7%] and 85 [62.5%], P = .423 and P = .248, respectively). ITU/HDU admission and arrhythmias were significantly higher in group B 12 (50%) and 6 (25%), compared to group A 8 (5.9%) and 9 (6.6%), P = .008 and P = .012, respectively. No other age-related differences in morbidity, mortality, and the 3-year survival rate were observed.

Conclusion: Octogenarians undergoing VMPR have a higher incidence of benign arrhythmias and admission to ITU/HDU, but otherwise are no different to younger age groups in terms of conversion to thoracotomy, hospital stay, morbidity, and mortality. Accepting octogenarians early in the VMPR programme did not compromise the outcome results.

Post Graduate Course: General Thoracic Surgery

TUESDAY, JUNE 14, 2011, 07:00 – 08:00 H

OP138—MINIMALLY INVASIVE REDO SURGERY AFTER UNSUCCESSFUL RAVITCH REPAIR FOR PECTUS EXCAVATUM

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Pectus excavatum is the most common chest wall deformity, and both open surgery and minimally invasive repair have been proposed for primary correction. Minimally invasive repair can also be performed as a redo procedure in patients with unsuccessful previous Ravitch repair.

A total number of 185 patients underwent a minimally invasive repair of pectus excavatum at our institute between August 2005 and March 2011. Sixteen patients who had had a previous unsuccessful Ravitch repair of the deformity had redo minimally invasive repair. Fourteen of the patients were male, and the median age was 16 years (range: 7-29). The deformity was symmetric in 13 cases. One bar in 10 patients and 2 bars in 6 patients were used for the repair. Operation duration was between 30 and 120 minutes (median: 70), and length of hospital stay was between 3 and 10 days (median: 5).

Minimally invasive repair is a safe and easy operation for the correction of pectus excavatum. Previous open surgical repair is not a contraindication for the redo minimally invasive surgery, and it can be performed with acceptable morbidity and length of hospital stay.

Abstract Sessions: Short Oral Presentation

Short Oral Presentation I

MONDAY, JUNE 13, 2011, 15:30 – 17:00 H

SOP2—COMPARISON OF EFFECT OF STANDARD CPB VERSUS MINI CPB ON PERIPHERAL TISSUE (SKELETAL MUSCLE) OXYGENATION BY DIRECT TISSUE OXIMETRY

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Introduction: Hypoperfusion is associated with the risk of postoperative organ dysfunction in cardiac surgery with cardiopulmonary bypass (CPB).

Aim: The aim of this study was to compare the effect of standard CPB and mini CPB on skeletal muscle oxygenation when measured by direct peripheral tissue oximetry.

Methods: Twenty patients, indicated for elective coronary surgery, were randomised into 2 groups—group A (10 patients operated on using standard CPB) and group B (10 patients operated on using mini CPB). Direct tissue oxymetry was performed by the optical catheter (Neurovent® PTO Raumedic AG, DE) introduced into the deltoid muscle. Continuous measurement of tissue oxygen tension (PO2) was made during the surgery and postoperative period. Blood pressure, blood flow during CPB, laboratory markers, and blood gases were recorded.

Results: The groups did not differ in the basic pre- and perioperative characteristics. Similar and comparable dynamic changes of skeletal muscle oxygenation were found in both groups. PO2 decreased after the introduction to anesthesia and more significantly during CPB. After the disconnection from CPB at the end of the operation, PO2 returned to preoperative values. During the first hours after admission of the patients to the intensive care unit PO2 decreased progressively, reached in minimum value at 4 hours, and increased slowly thereafter. There was a significant correlation of PO2 with mean arterial blood pressure and blood flow all the time. There were no significant differences in data in the both groups.

Conclusion: The results of this measurement demonstrate that both technique (standard versus mini) of CPB produce low muscle oxygen tension and thus little perfusion of skeletal muscle. The data also indicate that both high mean arterial blood pressure and high flow are necessary during bypass to ensure skeletal muscle perfusion.

Supported by grant IGA Ministry of Health, Czech Republic, No.NS/10376-3.

SOP3—PATIENT OUTCOME AFTER MVR WITH MECHANICAL OR BIOPROSTHESES: DO THE BENEFITS OF A BIOPROSTHESIS OUTWEIGH THE REOPERATION RISK?

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Objective: Aortic valve replacement using the microsimulation modelling was previously published. Although results of MVR with different valve prostheses are well documented in terms of survival, patient life-time risks of (valve related) events are less well explored. We used a large primary dataset of 2661 patients who received isolated MVR with either a bioprosthesis (56%) or a mechanical prosthesis (44%) between 1982 and 2003 to simulate outcome of patients after MVR with either valve type.

Methods: Data on postoperative and long-term survival were collected and analyzed. Using microsimulation we compared total age and gender-specific life-expectancy (LE), event-free life-expectancy (EFLE), reoperation-free life-expectancy (RFLE), and life-time risks of reoperation and valve related events between both valve types.

Results: Total follow-up was 17,923 patient-years. Mean follow-up was 6.1 years (max xx) in the biological and 7.6 years (max XX) in the mechanical arm. Mean age was 67 and 59 years for the biological and mechanical groups, respectively, and concomitant CABG 48% and 33%. For a 67-year-old male (mean age in biological group) LE, EFLE, and RFLE for biological versus mechanical prostheses were respectively 9.2 versus 9.1; 7.1 versus 7.0; 7.8 versus 8.7. Life-time risk of reoperation was 30.7% versus 6.7%.

Conclusions: Microsimulation provides new insight into patient life-time risks of complications after MVR with different valve prosthesis types: even for patients in their early seventies, RFLE is better with a mechanical prosthesis, while LE and EFLE remain comparable. These data suggest the threshold for replacing the mitral valve by a mechanical prosthesis instead of a bioprosthesis should be at a higher age than is currently recommended.

SOP4—ATRIAL VELOCITY AND DEFORMATION AS MARKERS OF ATRIAL MECHANICAL TRANSPORT FOLLOWING ATRIAL FIBRILLATION SURGERY USING TRANSESOPHAGEAL DOPPLER MYOCARDIAL IMAGING

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Objective: Controversy surrounds the issue of atrial transport following the restitution of sinus rhythm (SR) after permanent atrial fibrillation (AF). Postoperative spontaneous restitution of SR occurs briefly in many patients with AF. We aimed to determine whether postoperative conversion of AF to SR leads to restoration of atrial contractility, and whether radiofrequency ablation (RFA) independently impacted atrial function.

Methods: We evaluated 24 patients with permanent AF. Twelve patients (64 ± 9 years, EuroSCORE 5 ± 5) underwent a biatrial MAZE procedure. Twelve patients with permanent AF (69 ± 8 years, EuroSCORE 8 ± 6) who were briefly in SR intraoperatively, but did not undergo any atrial fibrillation surgery, comprised the non-RFA group. Tissue Doppler myocardial imaging was performed pre- and post-surgical intervention. Tissue velocity (TVI) and strain rate (SRI) data were acquired at the left atrial lateral wall.

Results: Baseline ECG demonstrated preoperative AF and post-procedural SR in all studied patients. Postoperative atrial contraction was restored in both groups. Within the RFA group, postprocedural TVI values were lower during ventricular systole compared to preprocedural values (–2.1 ± 2.2 versus –4.1 ± 2.3, $P = .03$). Such changes were not noted in the non-RFA group. Conversely, the late diastolic postprocedural SRI was higher in the RFA group than in the non-RFA group (–1.4 ± 1.2 versus –0.6 ± 0.6, $P = .04$). Observed TVI and SRI values were lower than reported normal values.

Conclusion: Coordinated atrial activation with induction of atrial contraction occurs with low velocity and deformation both in patients with and without atrial fibrillation surgery. Atrial electrical activation is, therefore, not synonymous with normal atrial contraction. RFA does not further reduce the atrial contractile capacity in comparison to the atria that have spontaneously converted into SR. Conversely, patients in the RFA group had modestly superior late diastolic tissue Doppler imaging profiles. Impairment in atrial reservoir function post-RFA, likely due to ablation induced reduction in tissue compliance, was shown.

SOP5—CAN HEPARIN DOSE IN PERIPHERAL VASCULAR INTERVENTION BE USED IN OFF-PUMP CORONARY ARTERY BYPASS GRAFT SURGERY?

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Objective: Off-pump coronary artery bypass (OPCAB) may be considered a peripheral vascular intervention (PVI). During PVI, weight-based heparin dosing with a target ACT of 250 seconds is considered appropriate, since it minimizes the bleeding risk without compromising procedural success or increasing thromboembolic complication. Standard anticoagulation protocols have clearly been defined for cardiac operations performed with cardiopulmonary bypass. Conversely, there is a lack of consensus regarding peri-operative anticoagulation management in OPCAB. This study evaluates the effects of different Activated Clotting Time (ACT) levels on post-operative bleeding and clinical outcome in OPCAB patients

Methods: From August 2009 to March 2010, 200 patients scheduled for OPCAB were randomly enrolled in 4 ACT groups. Target ACT was set at 250 seconds (group I), 300 seconds (group II), 350 seconds (group III), and 400 seconds (group IV). Hepcon HMS Plus™ Hemostasis Management System (Medtronic) was used to identify individual heparin needs, to verify heparin concentration, heparin-protamine titration and ACT level. Postoperative coagulation panel, chest tube drainage, perioperative MI and clinical outcome were recorded.

Results: Patient demographic and operative data showed no significant difference. Group I (615 ± 218 mL) showed significant difference in chest tube drainage when compared to group III (733 ± 296 mL, $P = .003$) and to group IV (820 ± 295 mL, $P = .00037$) and not significant difference to group II (681 ± 296, $P = .09$). Perioperative myocardial infarction and other postoperative

complications were similar in all groups, except from blood products administration (significant lower between group I and IV).

Conclusions: In OPCAB patients, 250 second target ACT reduces blood loss, when compared to ACT > 350 seconds. Target ACT > 350 does not prevent undesired clotting during anastomosis. We believe that 250 seconds target ACT offers optimal anticoagulation level in OPCAB patients as well as in PVI.

SOP6—HEMODYNAMIC AND CLINICAL ADVANTAGE OF A TOTALLY SUPRA-ANNULAR MECHANICAL VALVE

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Background: The bileaflet Bicarbon Overline valve (Sorin Biomedica Cardio S.r.l., Saluggia, Italy) is a mechanical valve designed for a totally supra-annular implant with the aim of improving hemodynamic performance.

Methods: Between September 2004 and June 2010 all patients in which an Overline prosthesis was used for AVR with or without other concomitant procedures were selected (n = 168, mean age 61.6 ± 9.9 years, 38% males). All patients were monitored with clinical examination and serial echocardiography before and 9-12 months after the procedure.

Results: At preoperative echocardiography, average effective orifice area was 0.80 ± 0.41 cm^2. At operation, 27% of patients received a 18-mm valve, 55% a 20-mm valve, and 18% a 22-mm valve. Associated procedures were performed in 91 (54.2%) patients, and no annulus enlargement was required. At 12-month follow-up, peak and mean transprosthetic gradients were 23.6 ± 8.1and 12.9 ± 4.9 mmHg, respectively; mean effective orifice after surgery was 2.01 ± 0.26 cm^2. We had no incidence of aortic prosthesis mismatch. Interventricular septum thickness (12.1 ± 2.6 versus 11.2 ± 2.0; $P = .05$) and left ventricular end-systolic diameter (51.9 ± 28.2 versus 40.5 ± 22.7; $P = .05$) were reduced after surgery. Mean follow-up was 2.3 years. Thirty-day mortality rate was 2.4%. Cumulative survival at 3, 12, and 24 months was 96%, 93.7%, and 91.7%, respectively. Freedom from any valve related event at 3, 12, and 24 months was 98.6%, 97.8%, and 93.3%, respectively.

Conclusions: In our series, the Bicarbon Overline prosthesis showed a good hemodynamic performance, no incidence of patient-prosthesis mismatch, and favorable early clinical results.

SOP7—PROGNOSTIC VALUE OF THE ISHLT AND GERMAN WORKING FORMULATIONS FOR TRANSPLANT VASCULOPATHY IN SURVIVAL AFTER HEART TRANSPLANTATION

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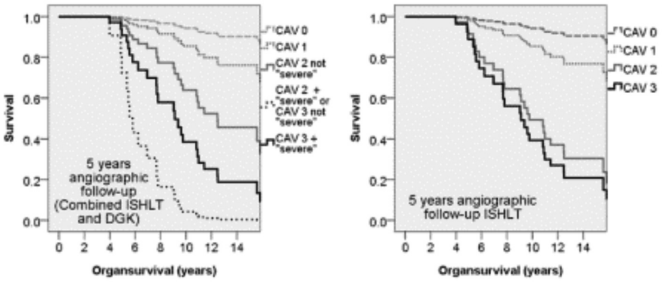
Background: Recently, the ISHLT and the Working Group on Thoracic Organ Transplantation of the German Cardiac Society (DGK) published diagnostic standards for the angiographic evaluation of coronary artery graft vessel disease (CAV). We present a retrospective study on the prognostic impact of these classifications.

Methods: We evaluated 641 patients (535 men) who underwent primary heart transplantation between 1986 and 1993. Coronary angiographies (n = 829) performed at 30 days, 1, 5, 10, 15, and 20 years were evaluated according to the ISHLT (grade/localization of stenosis and allograft dysfunction; grades 0-III) and the DGK standards (grade/localization of stenosis, tapering pattern of large conduct vessels [positive versus negative remodelling], peripheral obliterations; grades 0-II). Survival analysis and Cox regression were done for major cardiac events (lethal myocardial infarction, sudden cardiac death, graft failure).



[Original and the modified classification]

Results: The overall prevalence of ISHLT grades 0, I, II, and III was 58%, 31%, 8%, and 2%, and of DGK grades 0, I, and II, 63%, 34%, and 3%, respectively. Both classifications demonstrated a significant association with survival (ISHLT: $P < .001$; DGK: $P < .001$) as assessed by angiographic follow-up at 1, 5, 10, and 15 years. There was a significant time effect in Cox-regression, however. ISHLT grade 0 and I matched well with DGK grade (98%, 81%). ISHLT grade II and III demonstrated major discrepancies with DGK grade II. To analyze these differences ISHLT grade was incremented by one if DGK grade was "severe." The subsequent graph shows the original classification and the modified classification based on 5 years angiographic follow-up side by side.

Conclusion: Both the ISHLT and the DGK classification have strong prognostic value for predicting survival of cardiac transplant recipients. Time elapsed between the transplantation and the angiography must be considered in estimating overall prognostic risk. "Severe" CAV according to DGK provides improved discrimination in the high risk class.

SOP8—MODIFIED MAZE PROCEDURE USING BIPOLAR RADIOFREQUENCY CLAMP FOR ATRIAL FIBRILLATION IN NONE MITRAL VALVE CARDIAC SURGERY

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Objectives: The maze procedure which was developed by Lames Cox has excellent results although it has not been widely

adopted. Recently, ablation technology, such as bipolar radiofrequency (RF), enables surgeons to isolate the pulmonary veins and create linear left atrial lesions rapidly and safely. In this study we added surgical bilateral pulmonary vein isolation and right atrium maze procedure using bipolar RF clamp for atrial fibrillation in none mitral valve cardiac surgery. The purpose of our study was to investigate the early and mid term results of modified maze procedure using bipolar RF clamp in none mitral valve cardiac surgery.

Methods: From August 2006 to February 2011, 74 patients underwent modified maze procedure using bipolar radiofrequency clamp in cardiac surgery. Forty-one were in mitral valve patients and 33 were in non mitral valve patients. The study enrolled 33 patients, 20 males and 13 females. Age was from 41 to 88 years old (mean 70.8). Combined valve disease (A and T) was 1 pts, aortic valve disease was 20 pts, ischemic heart disease was 4 pts, adult congenital was 5 pts, and arch aneurysm was 3 pt. Re-do cases were 2 cases. The bipolar RF system consisted of the ablation-sensing unit and the Atricure Isolator (Atricure, Inc, Cincinnati, Ohio). Outcome variables were operative mortality and morbidity, electrocardiograms postoperatively, at discharge and in 6 months.

Results: There were no operative deaths. There were no major morbidities such as stroke, major bleeding, deep wound infection, and no pacemaker implantation. The ratios of sinus rhythm after operation (just after operation, at discharge, in 6 months) were 56%, 56%, and 63%.

Conclusions: Surgical bilateral pulmonary vein isolation and right atrium maze procedure using bipolar radiofrequency clamp for atrial fibrillation is rapid and safety procedure as a concomitant operation in none mitral valve cardiac surgery.

SOP9—COMPARATIVE ANALYSIS BETWEEN ACELLULARIZED AND IMMUNOLOGICALLY NON-TREATED VASCULAR XENOGRAFTS IN LONG-TERM SURVIVAL ANIMALS

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We implanted acellularized and immunologically non-treated porcine xenografts as an arterial graft in goats and comparatively analyzed the explanted grafts with gross observation, as well as light microscopy and immunohistochemistry, following the predetermined periods. For immunologically non-treated xenografts, bilateral porcine carotid arteries were harvested, and after short-term freezing at –70°C, were implanted into goats. The preparation of acellularized xenograft vessels has been performed with Nacl-SDS solution and stored at the freezer until use. The goats were randomly assigned for five periods of observation (1 week, and 1, 3, 6, and 12 months after implantation), 4 animals were observed at each of these times. Periodic ultrasonographic examinations were performed during observation period. Following the predetermined periods, the explanted grafts were analyzed. Among 20 animals, 2 goats died prematurely, and a total of 35 grafts were evaluated. Gross observations revealed nonthrombotic patent smooth lumens. Microscopic examinations of the explanted grafts showed satisfactory cellular reconstruction up to the 12-month observation period. The proportions of CD3 positive T-lymphocytes among inflammatory cells infiltrations were very low. In conclusion, these findings, as a whole, suggest that porcine vessel xenografts can be clinically acceptably implanted in the goats as a form of small-diameter vascular graft, regardless of the acellularized xenograft or immunologically non-treated xenograft.

SOP10—LONG-TERM SURVIVAL FOLLOWING AORTIC VALVE REPLACEMENT IN PROSTHESIS-PATIENT MISMATCH (PPM) CATEGORIES IN AGE GROUPINGS AND LEFT VENTRICULAR FUNCTION CATEGORIES REGARDLESS OF LACK OF PPM AS INDEPENDENT PREDICTOR

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Background: PPM has been reported by the authors regardless of effective orifice area indexes (EOAI) to not be predictive of early, late, and overall mortality (*Annals Thorac Surg* 2010). The authors have also reported that within basal mass index (BMI) categories, those with normal EOAI had better long-term survival than those with severe PPM. (*Can J Card* 2009). It was suggested that BMI associated with survival after AVR and PPM modifies the effect.

Methods: AVR patients (3343) were divided into PPM categories, normal (A), mild-to-moderate (B), and severe (< 0.65cm^2/m^2) (C). The severe PPM category had a preponderance of females (57%), obesity (90.1%), valve size ≤ 21mm (91%), and concomitant CABG. Kaplan-Meier survival analyses were performed on age categories (>60 years, 2564 patients; ≤60 years, 779) and ejection fraction (EF) categories (> 50%, 2707; and ≤50%, 636 patients).

Results: The overall survival for all patients at 15 years was for A, 38.1 ± 2.1%; B, 37.0 ± 2.2%; and C, 22.1 ± 6.5% (A > C, P = .040). The survival at 15 years was for patients >60 years: A, 27.2 ± 2.3%; B, 26.6 ± 2.4%; and C, 4.2 ± 3.9% (A > C, P = .025) while for patients ≤60 years (non-significant but C, n = 37 patients). The survival at 15 years was for patients with ejection fraction > 50%: A, 39.5 ± 2.3%; B, 39.7 ± 2.3%; and C, 22.8 ± 7.0% (A > C, P = .018) while for ≤50% (non-significant but C, n = 38 patients). Survival had been previously adjusted to determine the effect of covariates (EOAI, age, BMI, and EF). Severe EOAI had no interaction on adjusted survival for the evaluated covariates except very low level of significance for EF > 50%.

Conclusion: Even though EOAI has no predictive effect on survival, whether early, late, or overall the Kaplan-Meier survival curves do differ by EOAI categories. The reasons are related to complexity of patient populations in 3 categories, especially category of severe prosthesis-patient mismatch for ≤60 years and ejection fraction ≤50%.

SOP11—TISSUE ENGINEERING IN EXPERIMENTAL SURGERY: TECHNOLOGY OF DERIVING DECELLULARIZED COLLAGENOUS MATRIXES OF HUMAN VESSELS

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Objective: Development of a technology for deriving decellularized collagenous matrixes out of arterial vessels and surgical evaluation of their heterogeneous implantation into blood system of experimental animals.

Methods: The experiments were carried out on arterial vessels (n = 60). Most of them were thoracic and abdominal aortas of rats (n = 40) and fragments of human internal thoracic artery (n = 20). Decellularization was carried out with the solution of detergents. The quality of the procedure was evaluated by morphological control. The surgical implantation of a cell-free collagen conduit was carried out in 5 dogs. They were implanted in a femoral artery of the animals. The operation involved prosthesis of the part of femoral artery and sewing of distal and proximal anastomoses between the conduit and the artery. MRI and histological investigations were used as an efficiency control of the collagen conduit during 3-6 months in the follow up.

Results: We developed the technology that allows us to take out cellular elements from the wall of any arterial vessel without damage of the skeleton (carcass) of connective tissue. The required time for the matrix preparation is about 4 hours, moreover the developed protocol is suitable both for human and animal vessels. The next step was the evaluation of physical properties of vascular conduits after implantation of decellularized matrixes derived from intrathoracic human artery into arterial blood flow of a dog's legs. After the operation the blood flow was functional. There were no leakages noticed in the anastomoses; vascular walls could resist the hemodynamic pressure of the blood flow. MRI and morphological study revealed full functionality of the collagenous matrixes in the places of implantation.

Conclusion: The method of obtaining of decellularized collagenous matrixes out of arterial vessels allows its surgical heterogeneous implantation with good functioning during 6 months.

SOP12—OFF PUMP CORONARY REVASCULARISATION IN ACUTE CORONARY SYNDROME PATIENTS WITH CRITICAL CORONARY OCCLUSION AND FAILED PERCUTANEOUS INTERVENTIONS

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Background: Ischemic myocardium in patients presenting with acute coronary syndrome and critical coronary occlusion can be salvaged by immediate surgical revascularization when percutaneous interventions fail. Conventional On pump Revascularization in such patients is associated with higher morbidity therefore we performed revascularization off pump.

Method: Between January 2005 to January 2011, among 6249 patients having off pump revascularization, 883 had acute coronary syndrome with raised troponin I levels, critically occluded vessels, and failed percutaneous interventions. Troponin levels were above 10 ng/dL in 228 patients, and 249 had left ventricular dysfunction (LVEF < 35%), 328 were hypertensive, 303 diabetic, and 41 had renal dysfunction. Time lapse between onset of symptoms and revascularization was < 8 hours in 79 patients, 8-72 hours in 291, 3 days to 1 week in 338, and more than 1 week in 175 patients. Mechanical stabilizers and intracoronary shunts were used to facilitate anastamosis. Preoperative IABP was required in 65 patients, perioperative in 34, and inserted in 10 patients postoperatively. Internal thoracic artery and sequential saphenous vein grafts were used whenever feasible.

Results: Mean number of grafts was 2.94 ± 0.7 (range 1-6), mean ICU stay was 4.2 ± 1.7 days, ventilation time 26.4 ± 6.2 hours. Morbidity and mortality were higher in those with high preoperative troponin I levels (> 20 ng/dL), cardiogenic shock and time lapse between onset of symptoms and revascularization 8-72 hours. Overall Mortality was 21 (2.48%) and causes of death were intractable arrhythmias in 3, renal failure in 5, MOF in 7, and septicemia in 6.

Conclusion: Off pump revascularization improves outcome in patients with acute coronary syndromes and critical coronary occlusion when percutaneous interventions fail. Minimizing time lapse between onset of symptoms and revascularization with judicious use of IABP further minimizes morbidity and mortality.

SOP13—FEASIBILITY OF OFF-PUMP CORONARY ARTERY BYPASS IN SIGNIFICANT LEFT MAIN DISEASE

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Background: The role of off-pump coronary artery bypass graft surgery (OPCABG) for left main disease is still controversial. We report our experience of OPCABG in patients with left main disease.

Methods: From January 2006 to January 2011, 60 patients (50 males and 10 females) with left main disease underwent OPCABG at our institution out of which 50 patients had Left main stenosis >50% and 10 patients had left main stenosis >70%. Fifteen patients had diabetes mellitus, 10 patients were both diabetic and hypertensive, and 10 patients had strong family history of coronary artery disease. In case any haemodynamic instability developed during the procedure, it was managed using the intra-aortic balloon pump or converting to on-pump beating heart CABG to achieve complete revascularization.

Results: Early and late mortality were 0 and 1.1%. The intra-aortic balloon pump was used in 15 patients and out of which 33% were converted to on-pump beating heart CABG. The patients who required IABP support 33% had left main stenosis >70% and 33% had significant left main stenosis >50% with proximal right coronary artery stenosis >90%. Complete revascularization was done in all the patients. Other complications

(e.g. reoperation for management of bleeding, chest wound problems, arrhythmias, cerebrovascular accident, pericardial effusion, pulmonary complications, deranged renal function) were reported in 10 cases. The duration of mechanical ventilation and total hospital stay were 12 ± 3.0 hours (0-5 hours) and 7 ± 1.0 days respectively. Atrial fibrillation was seen in 5 patients.

Conclusions: A modern OPCABG approach offers low mortality, excellent clinical outcomes, and does not come at the price of less complete revascularization in LMCA stenosis. As the use of intra-aortic balloon pump and conversion to on-pump beating heart surgery was more in cases of LMCA stenosis >70% and those with associated significant proximal right coronary artery disease so one should be according prepared.

SOP14—LONG TERM OUTCOME WITH CARDIAC SURGERY IN AFRICAN AMERICANS: 15 YEARS EXPERIENCE

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Objectives: There is conflicting data in the literature on whether the black race is an independent predictor of operative mortality following heart surgery. However most publications have been focused on short-term results with few on long-term outcomes.

Methods: One hundred forty-eight black patients, comprising 48.0% men, mean age 61.2 (range 24-88) years operated on between 1996 and 2010 by a single surgeon in a community hospital were retrospectively reviewed to determine long-term outcomes, and for comparisons to other published series. Data were entered into an Excel spreadsheet and transferred to an SAS file for statistical analysis.

Results: 76.3% underwent isolated CABG with 22.1% off pump, 13.5% isolated Valve, 6.8% CABG + Valve, 2.0% Aortic root reconstruction, and others 1.4%. 4.7% were redo, and IABP was used in 13.5%. 95.2% had hypertension, 54.1% diabetes, 18.9% end stage renal disease (ERSD), and 7.4% morbid obesity. 14.1% had left main stenosis > 50%, and 48.8% LV systolic dysfunction with EF < 50.0. Predicted logistic EuroScore mortality was 11.1%, and observed was 6.75%. Eight deaths were CABG and 2 valve related, with 50% ESRD patients. Using the social security death index regardless of cause, 52 patients died at a mean of 25.8 months, while 92 patients are alive with a mean of 69.8 months after surgery.

Conclusions: African Americans often present at a more advanced disease stage compared to whites and often with more co-morbidities at time of surgical consultation. This may be attributable to lack of healthcare access, with resultant delay in referral for surgical treatment. However for those surviving surgery, the life expectancy after taking into consideration their co morbidities was comparable to those reported in the literature.

SOP15—PECULIARITIES OF MITRAL VALVE'S STRUCTURE AS A REASON OF OBSTRUCTION IN HYPERTROPHIC CARDIOMYOPATHY

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Objective: In our research we compare morphometric characteristics of MV between the healthy individuals and the patients with HOCM in order to study the mechanism of SAM towards IVS according to echocardiography data.

Methods: Between 2004 and 2010, 33 patients with HOCM were examined (19 female and 14 male patients; mean age, 49.4 ± 14.7 years). Using echocardiography we evaluated LV dimensions and the lengths of anterior and posterior leaflets of MV during full MV opening from MV annulus to the end of a cusp. A group of 53 healthy individuals was examined.

Results: All patients had SAM towards IVS; SPG on LVOT was 22-140 mmHg (mean rate 72 ± 34 mmHg). The length of anterior leaflet (AL) (28.0 ± 3.9 mm) in case of HOCM was by 21, 2% bigger than the length of the healthy person (23.1 ± 2.4 mm). Length index of the AL (15.9 ± 2.1 mm/m^2) in case of HCOM was by 27.2% higher compared to the one of the healthy individuals (12.5 ± 1.0 mm/m^2). Accordingly, the length of posterior leaflet (PL) by HOCM (21.7 ± 2.8 mm) and the length index of the PL (12.2 ± 1.8 mm/m^2) were by 33.1% and 38.61% higher than the analogous indices of the healthy individuals. The length of the PL of the healthy person was 16.3 ± 2.6 mm and the length index of PL 8.8 ± 1.4 mm/m^2. It was also revealed that by HOCM LV in systole was smaller by 20%.

Conclusions: Thus, SAM MV towards IVS can be explained by the phenomenon of congenital enlargement of MV leaflet dimensions, especially posterior leaflet dimensions. Due to LV reduction through its hypertrophy, MV becomes more mobile and "is drawn" into the LVOT in consequence of hydrodynamic Venturi effect.

SOP16—DEFINITION OF ACETYLSALICYLIC ACID RESISTANCE USING MULTIPLE ELECTRODE AGGREGOMETRY IN PATIENTS FOLLOWING CORONARY ARTERY BYPASS GRAFTING

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Objectives: A beneficial effect of acetylsalicylic acid (ASA) on vein graft patency has been reported, but some patients experience adverse events despite ASA treatment. Some of those events could be caused by inappropriate response to ASA.

The aim of this study was to define preoperative ASA resistance using Multiple electrode aggregometry (MEA) in group of patients undergoing CABG.

Methods: The study was prospective and observational. Participants were patients scheduled for CABG, and divided into 4

groups with respect to their preoperative antiplatelet therapy (APT). Group 1 received ASA 100 mg/day, Group 2 ASA 100 mg + clopidogrel 75 mg/day, Group 3 clopidogrel 75 mg/day, and Group 4 did not receive any APT. MEA with ASPItest (ASA sensitive) and ADPtest (clopidogrel sensitive) was performed prior to surgery. In Group 1 and 2, patients were characterized as ASA resistant if their ASPItest value exceeded the 75th percentile distribution.

Results: Study enrolled 131 patients. Significant differences both in the ASPItest ($P < .001$) and the ADPtest ($P = .038$) were observed between patients in different APT groups. In Group (1+2) ASPItest value of 27 AUC presented 75th percentile of distribution, thus indicating ASA resistance. There was no difference in proportion of ASA resistance with respect to age ($P = .568$), body mass index ($P = .365$), platelet count ($P = .250$) and fibrinogen level ($P = .298$). Group 2 patients had slightly lower ADPtest values, but no significant difference occurred (mean 60.05 versus 63.32 AUC, $P = .469$). In Group 1 and 2, significant positive correlation between the ADPtest and both, platelet count ($r = .347$, $P < .001$) and fibrinogen level ($r = .364$, $P < .001$) was described.

Conclusions: Association between low response to ASA and post-CABG major adverse ischemic events risk increasement has already been described. In patients with preoperative ASPItest exceeding 27 AUC, postoperative higher ASA dose or clopidogrel administration in addition to ASA should be considered.

SOP17—COMBINED MITRAL-AORTIC VALVE DISEASES: RISK-FACTORS OF SURGERY

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Objective: To analyze risk-factors in surgery of combined mitral and aortic valve diseases (CMAVD).

Materials: From 01 Jan. 1981 to 01 Jan. 2005, 1297 adult patients (pts) with CMAVD were operated. Thirty-one pts (2.4%) were in II NYHA class, 317 (24.4%) pts were in III, and 949 (73.2%) pts in IV. The average age was 46.4 ± 8.1 (14-69) years. The following procedures were performed: mitral-aortic valve replacement (MVAR) (n = 903), mitral valve replacement (MVR) + plastic procedure on aortic valve (AV) (n = 194), aortic valve replacement (AVR) + plastic procedure on MV (n = 173), and plastic procedure on both valves (n = 27). Previous closed mitral commissurotomy (CMC) was in 110 (8.5%) pts, constrictive pericarditis in 101 (7.8%), thromboses of LA in 75 (5.8%) pts. Concomitant tricuspid valve disease was corrected by De Vega (plus tricuspid commissurotomy in organic disease) in 258 (19.8%) pts. Preservation of MV's apparatus during MVR was in all cases of mitral incompetence, especially with ESVI >75 mL/m.q.

Results: The hospital mortality (HM) at the last 6 years was 7.1%. HM was higher for double valve replacement than in cases with plastic procedure on one valve. The value of HM depends of following main factors: IV NYHA class, small cavity of LV, end-systolic volume index of left ventricle (ESVI) < 15 mL/m.q. , LV's ejection fraction < 0.35, systolic pressure in pulmonary artery > 90 mmHg, massive thromboses of LA (thrombotic masses more than 1/3 of volume), previous CMC, calcification on both valves +3, ESVI > 110 mL/m.q., organic tricuspid valve diseases, narrow ostium of aorta, cross-clamping time of aorta > 180 minutes.

Conclusion: Preferably to perform correction of CMAVD without complicated forms in II or III NYHA class with bileaflet mechanical valve. The combination of described risk-factors increases HM.

Short Oral Presentation II

WEDNESDAY, JUNE 15, 2011, 11:10 – 12:20 H

SOP18—MANAGEMENT OF THE MALIGNANT PLEURAL MESOTHELIOMA; A SINGLE CENTER EXPERIENCE IN TURKEY "IN MEMORY OF PROFESSOR DR. HADI AKAY"

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Background: Malignant pleural mesothelioma (MPM) is still an important fatal disease and mostly due to aspestos or erionit in Turkey. The management of the MPM is crucial to the clinical and treatment approaches. The aim of this study is to review our experience in the management of the MPM patients for various treatment modalities.

Methods: Between 1994 and 2009, 236 patients with MPM have been evaluated for treatment of whom 153 (64.8%) are male and 83 (35.2%) are female. The mean age was 54.1 (range 28-86 years). Among them 57 (24.2%) patients were treated by decortication/pleurectomy and 13 (5.5.%) by extra-pleural pneumonectomy (EPP). Also, 158 patients (66.9%) underwent palliative minor surgery, which includes video assisted thoracoscopic surgery and mini thoracotomy for diagnosis, pleural drainage and pleurodesis. Percutaneous pleural biopsy and drainage was performed in 27 patients. Last 3 patients were treated with pleuroperitoneal shunt.

Results: The most of the patients (81%) had asbest history. Hystopathologic types of MPM were epitelial 78%, sarcomatoid 4%, and mixt 13%. The overall median survival for all patients was 13 months (95%CI 12-14). The median survival was 19 months (95%CI 17-21) for those major surgery (Pleurectomy/decortication and EPP) and 11 months (95%CI 10-12) for palliative minor surgery ($P = .000$). The median survival were 19 months (95%CI 18-20), 20 months (95%CI 15-25), 21 months (95%CI 18-24) for only major surgery, adjuvant chemotherapy and major surgery, and trimodality therapy ($P = .4278$) respectively.The morbidity ratio was 6.5%; prolonged air leak (2.5%) emphysema (2%), and

wound infection (2%). The mortality ratio was 4 %. The average hospitalization for all patients was 5.8 days (range, 3-17 days).

Conclusions: In conclusion; our results show an increased survival benefit, if the patients with MPM were treated with major surgery in combination with adjuvant chemo-radio or chemotherapy.

SOP19—BRONCHOSCOPIC CLOSURE OF TOTAL BRONCHOPLEURAL FISTULAS: EXPERIENCE IN FIVE CASES

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Objectives: Bronchopleural fistulas are serious conditions affecting patients in post operatory periods. Minimally invasive as endoscopic treatments usually are effectives only in small fistulas. Our objective is demonstrating our experience with the use of the Occlutech Figulla ASD Occluder N in the endoscopic treatment of 6 total broncopleural fistulas.

Methods: We treated 5 male patients, between 42 and 53 years, with 6 total bronchopleural fistulas (one patient that should have done a completion pneumonectomy was submitted instead to the second lobectomy). The indication to the previous resections was tuberculosis in 3, invasive aspergillosis in 1, and cancer in 1 patient. There were 2 fistulas of main bronchus and 4 fistulas of lobar bronchus. The fistulas diameter varied between 9 to 17 mm. The treatment were done under sedation in one and general anesthesia in four patients. The procedure was done through the flexible bronchoscope without auxiliary technique as rigid bronchoscopy, fluoroscopy or bronchography.

Results: Two patients have their fistulas closed with the occluder completely recovered by granulation tissue, one with 2 years and the other with 6 months after the treatment. Two other patients have the fistula closed with the occluder partially recovered 3 months after the treatment. One alcoholic patient, with desnutrition, and with 2 lobar fistulas have the 2 occluders in place 6 months after the treatment but with minimal signs of granulation tissue.

Conclusions: Although there are reports in the literature of bronchoscopic treatment, these are of small broncopleural fistulas. Total fistulas were until now a special challenge. Although more cases are necessary, the use of the Occlutech device in these cases of total broncopleural fistulas seems to be a definitive solution to this serious problem.

SOP20—THE FIRST SUCCESSFUL CASE OF INTRATHORACIC VACUUM ASSISTED INSTILLATION THERAPY FOR RESIDUAL SPACE EMPYEMA

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Introduction: Empyema remains a life threatening complication post pneumonectomy. It is a major post operative complication that is responsible for the majority of mortalities. Despite the recent development of different therapy options, over the last three decades, the incidence of pneumonectomy empyema (PPE) remains unchanged. Currently, there are no universally accepted treatments but open-window thoracostomy (OWT) is a commonly applied method. However, the results for this technique are not always satisfying.

Case: We report a 75-year-old male patient, who developed a late onset PPE 3 years after his operation which was resistant to conventional OWT treatment. In 2008 the patient had undergone a right pneumonectomy for a bronchogenic carcinoma and did not suffer from any complications at the time. Three years post-operatively, the patient presented with pus in his pneumonectomy space with no sign of bronchopleural fistula. The PPE was treated with thorax fenestrations and the wound was filled with two antiseptic flaps. The first attempt to close the wound was not successful and the empyema recurred which lead to the procedure being repeated. Over a period of 5 months, we filled the cavity with vacuseal sponges and applied continuous suction. Finally the patient was admitted to perform for Vacuum Assisted Instillation Therapy. The closure was a major interdisciplinary procedure. The remaining cavity was filled with a free latissimus dorsi muscle graft from the opposite side, since the patient had posterolateral thoracotomy.

Conclusion: This is the first successful case of intrathoracic vacuum instillation therapy after extended thoracic surgery. It appears to be an attractive treatment option for patients with large contaminated cavities in preparation for reconstructive surgery. The initial posterolateral thoracotomy made a sophisticated transplantation of a free muscle graft necessary and should be avoided. A muscle sparing approach via anterolateral incision is highly recommended.

SOP21—POSTINTERVENTIONAL EMPYEMA WITH BRONCHIAL STUMP INSUFFICIENCY—THE ROLE OF THE ENDOBRONCHIAL INTERVENTION

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Objective: To define the role of the endobronchial intervention in the management of the postinterventional empyema due to bronchial stump insufficiency.

Methods: Between Aug. 2008 and Jun. 2009; 4 patients (3 males, 1 female, mean age 71 years) with postresectional empyemas were treated in our Institute (out of 300 lung resections/year). In all of them bronchial stump insufficiency (BSI) was verified by bronchoscopy. Due to the poor condition of the pts, empyema cavity drainage with wide-spectrum antibiotics application was performed as the first step in accordance with our algorithm for the BSI management. Endobronchial intervention with fibrin-glue was applied to all pts (n = 4).

Results: After endobronchial closure failure in 2 patients, the limited thoracoplasty with myoplasty, debridement and re-closure of the bronchial stump were performed. In 2 patients endobronchial intervention with suction/irrigation drainage of empyema cavity led to definitive healing of BSI.

Conclusions: The post-interventional empyema after BSI is still the feared complication with high morbidity and mortality rate. Endobronchial procedures for BSI are reported with controversial results in the literature. Due to the poor performance status and sepsis, the definitive endoscopic closure of the bronchial stump can only be hardly obtained. The definitive solution—surgical BSI closure combined by the myoplasty and limited thoracoplasty (after the detoxication and stabilization of the patient)—is the recommended treatment for BSI empyema.

SOP22—VIDEO-ASSISTED SURGICAL EXCISION OF PERICARDIAL CYSTS

Iliadis, K.,[1] Athanassiadi, K.,[2] Mallios, D.,[1] Chatzinis, A.[1]
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Objective: Pericardial cysts are uncommon benign congenital mediastinal lesions, usually asymptomatic unless they reach large size. Diagnostic difficulties encountered and the utility of video-assisted thoracoscopic excision are described.

Material: During the last 3 years, 5 patients (3 female and 2 male) ranging in age between 19 and 54 years were admitted to our departments with a pericardial cyst. Three patients were asymptomatic the cysts were detected on routine radiological examination, while two complained for dyspnea. The preoperative work-up for all patients consisted of a chest X-ray and either CT scan or MRI of the thorax. Indications for surgery included the presence of symptoms, uncertain diagnosis and radiological evidence of enlargement. The diameter ranged from 4 cm to 19 cm. All cysts were located at the cardiophrenic angle right or left. Two or three ports were used. After visualization of the phrenic nerve, the cyst was aspirated to allow traction and dissection of pericardial adherences using endoscopic scissor and cautery in 2 cases, while in one case a small incision of 3.5 cm was used to extract the cyst. Histology revealed a fibrous wall with a thin mesothelial lining.

Results: None of the 5 patients in our series required conversion to thoracotomy. Mean operating time was 60 ± 15 minutes. The chest drain was removed on postoperative day 1 and patients were discharged on postoperative day 2. No postoperative complications were recorded.

Conclusion: Thoracoscopic excision of pericardial cyst provides a radical therapy and should be considered nowadays as the treatment of choice.

SOP23—USE OF A MODIFIED APICAL PLEURAL TENT TECHNIQUE TO PREVENT AIR LEAK AFTER RIGHT UPPER AND MIDDLE BILOBECTOMY AND STAPLED EXCISION OF THE SUPERIOR SEGMENT OF THE RIGHT LOWER LOBE

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Objectives: The pleural tent procedure was first described in 1956 and was performed to reduce the apical pleural dead space and to prevent overdistension of the remaining lung following lung resection for pulmonary tuberculosis. It has recently been adapted to reduce air leaks following upper lobe surgery in carcinoma and bullous emphysema. The procedure entails extrapleural mobilization of the parietal pleura in the apex of the chest cavity, allowing it to fall down over the visceral pleura of the remaining lung, eliminating intrapleural dead space and reducing air leak duration.

Methods: We describe a modified pleural tent procedure in a 55-year-old patient undergoing right upper and middle lobectomy and stapled excision of the superior segment of the right lower lobe for a large right upper lobe adenocarcinoma.

Results: After a right thoracotomy through the 5th intercostal space and anatomic resection of the right upper and middle lobes and stapled excision of the superior segment of the right lower lobe, it was judged that a large apical space would remain, despite mobilization of the pulmonary ligament. To prevent that, the parietal pleura was mobilized starting at the level of the upper border of the thoracotomy incision and ending at the apex just at the level of the subclavian vessels. The arc of the dissection was about 180º. That was a limited mobilization of the parietal pleura.The pleural flap was then incorporated into the pericostal sutures in a mode, lower intercostal-flap-upper intercostal, to create a tent configuration. Postoperative course was unremarkable with air leak resolving after 5 days.

Conclusions: This modified technique we describe can be useful, because it is a quite easy and short procedure that does not add remarkably to the operating time. Of course, its efficacy has to be studied more extensively.

SOP24—NON TRAUMATIC HAEMOTHORAX—BE AWARE OF THORACIC VASCULAR EMERGENCY

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Background: Inter costal tube insertion for a suspected non traumatic haemothorax and subsequent diagnosis of Catastrophic condition like ruptured pulmonary Arterio-Venous Malformation (AVM), thoracic aortic aneurysm and Catamenial Hemothorax is not uncommon. We like to present our institutional experience with non traumatic haemothorax.

Materials and methods: At PSG IMS&R Retrospectively analysed those presented with non traumatic haemothorax over 1 year from January 2008 to December 2009 (total number of cases: 5 [M:F, 3:2], average age 35 years. Causes of hemothorax: ruptured pulmonary AVM in 1, ruptured thoracic aortic aneurysm in 2, ruptured pulmonary bullous in 1, catamenial haemothorax in 1. All these patients underwent Intercostal tube drainage at outside hospital and referred to our centre for further management. Malignant causes for Haemothorax excluded from the study.

Management strategies: Ruptured Pulmonary AVM underwent Left thoracotomy and Lower lobectomy. Ruptured Thoracic aortic aneurysm underwent Left thoracotomy and aneurysm repair with inter position grafting under Left atrio femoral bypass. Ruptured thoraco abdominal aneurysm underwent thoraco laprotomy and aneurysm repair with interposition grafting under Left Atrio femoral bypass. Ruptured Bullous underwent Left thoracotomy bullectomy. Catamenial hemothorax underwent Thoracoscopic pleurodesis followed by hormonal manipulation.

Results: One case of ruptured thoracic aneurysm developed major peri operative stroke. Rest all recovered well and follow-up over 6 months satisfactory.

Conclusion: Non traumatic haemothorax requires high index of suspicion of Catastrophic thoracic vascular emergency. Simple chest tube drainage of the haemothorax may lead to cardio respiratory collapse, which requires urgent appropriate intervention to prevent inevitable death.

SOP25—MEDIASTINAL LYMPHANGIOMAS IN ADULTS: THREE CASES WITH DIFFERENT RADIOLOGIC AND CLINICAL FEATURES

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Lymphangiomas are congenital lymphatic malformations that occur most commonly in the head, neck, and axilla; however, they may arise anywhere in the developing lymphatic system. Mediastinal lymphangiomas are very rare, typically benign and present as incidental mediastinal lesions in adults. The radiographic appearance of lymphangiomas in the thorax is varied. The diagnosis cannot be suggested on the basis of clinical findings or radiologic studies alone. Most of the MLs are diagnosed intra or post operatively. Local recurrence may observed due to incomplete excision of the lesions.

In our case report, 3 patients with mediastinal lymphangiomas were evaluated according to the clinical and radiological findings. The patients operated on mediastinal cysts without preoperative diagnosis. Two of the patients operated via thoracotomy, 1 patient via VATS. Histopathologic types were cystic lymphangioma in 1 patient, cystic and cavernous (mixed) type in 1 patient and thoracic duct cyst in 1 patient. The patient with bilateral mediastinal giant cysts was asymptomatic, whereas the small cyst about 2 cm in diameter were caused severe pain.

Clinical presentation of a ML may vary without depending on the size. Clinical and radiological features are based on histology and anatomic location of the ML. Although, VATS is the preferred method for surgical treatment of the mediastinal lymphangiomas, thoracotomy may required to prevent recurrence in.

SOP26—STRANGULATED TENSION VISCEROTHORAX WITH GANGRENE OF THE STOMACH IN MISSED TRAUMATIC DIAPHRAGMATIC RUPTURE

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Objectives: Acquired diaphragmatic hernias are usually post traumatic in occurrence. In patients who have blunt trauma and associated diaphragmatic hernia, the diagnosis may be missed or delayed, often leading to poor treatment outcomes. The purpose of this case report is to highlight the challenges in managing an acquired viscerothorax with gangrene of the stomach in a haemodynamically unstable patient.

Methods: We present the management of a rare occurrence of tension viscerothorax due to missed traumatic diaphragmatic rupture in a 25-year-old woman whose condition was complicated by gangrene and perforation of the fundus as well as questionable viability of the anterior wall of the body of the stomach.

Results: The patient had a successful emergency trans-abdominal suture plication of the diaphragm and a gastroplasty and has remained symptomless postoperatively for about 5 months now.

Conclusion: Tension viscerothorax be considered in patients who have sustained blunt chest and abdominal injury and have features suggestive of a tension pneumothorax. Careful interpretation of chest radiographs, thoughtful consideration in deciding the access to the diaphragmatic repair as well as expeditious resuscitation and surgical intervention are likely to lead to a good outcome.

SOP27—HAEMOPTYSIS: A RARE CASE OF SURGICAL INTERVENTION FOR AN INCIDENCE OF CHILI ASPIRATION

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Objective: Red Chili (Capsicum annum L) is a commonly used ingredient among South Asian cooking. Reported cases of chili aspiration leading to morbidity or mortality in adults are rare. We report a case of a 46-year-old female who had aspirated a piece of chili and subsequently presented with haemoptysis.

Method: This patient had a 6 month old history of aspiration of a chili piece and subsequent severe sudden onset of wheeze. At that time she underwent fiberoptic bronchoscopy with extraction of tiny pieces of chili and treated with bronchodilators and antibiotics. With passage of time 2 months later she developed chronic cough with foul smelling sputum and hemoptysis. Chest X-ray showed opacity in the right lower lobe and CT scan showed Fibroparenchymal lesion in the lateral basal segment of the right lower lobe of the lung. Right lower lobectomy was carried out as an emergency procedure following a large bout of repeated hemoptysis via a right mid axillary mini-thoracotomy incision.

Result: Patient was discharged on the 6th postoperative day with good recovery with no residual symptoms. Histology revealed right lower lobe consolidation, most likely due to a foreign body, without any atypical cells.

Conclusion: Endobronchial foreign bodies like pieces of chili can lead to significant morbidity if not removed in the initial presentation.Fiberoptic bronchoscopy is used to remove foreign bodies but can be difficult at times leading to further complications. When a suspected foreign body is not seen on a plain CXR, then a CT scan of the chest must be done to look for other clues. Unsuccessful foreign body removal via bronchoscopy may require surgical intervention.

SOP28—CLINICAL OUTCOMES AFTER SURGICAL MANAGEMENT OF THYMOMA

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Wessex Cardio Thoracic Centre, Southampton University Hospitals NHS Trust, Cardiothoracic Surgery, Southampton, United Kingdom

Objective: To describe a single institutional experience on the surgical management of thymoma.

Methods: Retrospective study on patients who had thymectomy for presumed thymic pathology decided by CT/PET scan in a University hospital in Wessex, United Kingdom. The outcome measure were patient demographics, clinical and oncological data, risk factors, pre and post operative events, tumour staging, surgical approach, multidisciplinary treatment and survival.

Results: Between January 2004 and January 2011, 63 patients underwent surgery for thymic pathology (30 women and 33 men). Median age of the patients was 65 years (range, 19-85). Myasthenia gravis was associated with 26 patients (41%) while in 37 patients (59%), it was detected incidentally. Open thymectomy was performed on 32 (51%) patients while 28 (44%) patients had thoracoscopic approach either through left or right side of the chest incorporating three port sites. There were 3 (4.7%) conversion of thoracoscopy to sternotomy due to adhesion. The mean length of hospital stay after the surgery was 4.8 ± 3.7 days. WHO histological staging subdivided the patients in to 7 Type A (18%), 12 AB (30%), 6 B1 (15%), 7 B2 (17%), and 8 B3 (20). Twenty-three (36%) patients who had a radiological diagnosis of thymoma were proven as other anterior mediastinal tumours on histology. Radiotherapy was used as an adjunct to surgical treatment in 82% of patients with stages II and III disease. The actuarial 3-year survival rate is 98%. Mixed cellular histological features was more commonly seen with stage I disease.

Conclusions: Thymomas are slow growing tumours which can be often missed in the absence of symptoms. With the multidisciplinary approach, survival rate even in patients with invasive disease shows significant improvement. Our early experience indicates that different surgical approaches yielded comparable outcomes.

SOP29—PLEURAL EMPYEMA IN CHILDREN: THE IMPACT OF DECORTICATION

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Objective: The purpose of this clinical retrospective study was to assess the impact of the surgical treatment of late and fibrotic empyema in children.

Methods: Eight consecutive children (4 boys and 4 girls) out of 37 pediatric patients with non-malignant thoracic surgery (21.6%) underwent decortication for pleural empyema in a 10-year period (from 1998 to 2007). The mean age was 9.07 ± 6.40 years (range: 28 days to 15 years).

Results: Two children had previous history of trauma. All children had undergone conservative therapy including chest tube treatment prior to surgery. Pleural thickening was present in all cases. Surgical treatment consisted of pleural decortication via mini-thoracotomy in all cases and concomitant parenchymal resection in three cases (38%). The complete response rate was 100%.

Conclusion: Although the optimal treatment of children with parapneumonic effusion remains controversial, in cases of late empyema and failure of the conservative therapy surgery is indicated. Pleural decortication is an effective and safe treatment of late and fibrotic empyema in children.

SOP30—COMPARISON OF THE MAIN BRONCHUS STUMP SUTURING METHODS: 20 YEAR EXPERIENCE

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[1]*Institute of Oncology Vilnius University, Department of Thoracic Surgery, Vilnius, Lithuania;* [2]*Institute of Oncology, Department of Thoracic Surgery, Vilnius, Lithuania*

Materials and Methods: From 1990 to 2009 a total of 580 pneumonectomies were performed at the Department of Thoracic Surgery and Oncology of the Institute of Oncology, Vilnius University. Of them, 327 (56.3%) were right pneumonectomies and 253 (43.6%) were left pneumonectomies. Group I patients (190 patients, 32.7% of all patients), machine suture using Soviet; Group II patients (220 patients, 37.2%), using mechanical suturing apparatus (TA-30, TA-40, Proximate RL plus-30, 60, Linear stapler 40); and Group III patients (170 patients, 29.3%), handmade suture, of them Sweet method was used in 15 (8.8%) patients, Owerhold method in 63 (37.2%) patients, and Goldstraw method in 92 (54.1%) patients.

Mediastinal lymph nodes were removed during surgery: lymph nodes from one zone were removed in 193 (33.2%) patients, and dual-zone lymphadenectomy was performed in 387 (66.7%) patients. After removing lung bronchial stump was covered in 285 (44.4%) patients: covering with pericardial fat was performed in 110 (38.5%) patients, with parietal pleura in 38 (13.3%), with tissue surrounding vena azygos in 22 (7.7%) patients, with vascularized intercostal muscles in 15 (5.2%), with omentum major patch in 2 (0.7%) patients, with mediastinal pleura in 98 (34.3%) patients, and in 295 (50.8%) patients no bronchial stump covering was preformed.

Conclusions:

1. Bronchial fistula occurred in 24 (12.6%) patients in Group I, 9 (4.1%) patients in Group II, and 14 (8.2%) patients in Group III.
2. In patients with stage IIA lung cancer 1-year and 5-year survival was the same, 69.8%.

In stage IIB patients survival was 60.3% and 25.6% respectively.

In stage IIIA and IIIB lung cancer patients 1-year survival was 50.8% and 36.0%, and 5-year survival was 12.9% and 5.5%. No one patient with stage IV lung cancer survived for 5 years.

Short Oral Presentation III

WEDNESDAY, JUNE 15, 2011, 14:40 – 16:00 H

SOP31—BLAND-WHITE-GARLAND-SYNDROME

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Introduction: A 40-year-old female patient was admitted to our hospital with chest pain. The patient reported to be in a good physical exercise condition with no signs of pervious angina pectoris. However, an episode of syncope occurred once after physical exercise, from which the patient recovered quickly.

Background: We initiated cardiac diagnostic testing. ECG showed no abnormalities (sinus rhythm, 80/min, left axis deviation). In the echocardiography an antero-lateral hypokinesia of the left ventricle was observed. The cardiac-MRI confirmed this finding to be a subendocardial scar. Due to the age of the patient and the fact of being in good physical condition and not previously experiencing angina pectoris we initially refrained from performing coronary angiography. But since all the other investigations did not lead to a diagnosis, we finally performed coronary angiography, which led to the diagnosis of a White-Garland-Syndrome. The left coronary artery arises from the pulmonary artery below the pulmonary valve. The heat is supplied by a dilated right coronary artery with large collaterals to the left coronary artery.

Discussion: Currently the patient is symptom-free and does not consider the possibility of surgical treatment. Due the diagnosis of White-Garland-Syndrome an intensive follow up of the patient was initiated.

SOP32—LONG-TERM FOLLOW UP OF CHAGASIC PATIENTS WITH SEVERE HEART FAILURE TREATED WITH IMPLANTABLE ELECTRONIC CARDIAC DEVICES

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Objective: To verify whether chagasic patients treated with resynchronizer (R), or R associated with cardiac defibrillator (RC), presented reduced mortality, improved functional class (FC) and ejection fraction (EF), or a difference in mortality between the two surgical groups, during follow up.

Methods: One hundred forty-five patients underwent surgery at the Hospital da Santa Casa of São Paulo between Jul. 2002 and Dec. 2005: 67 patients received R (Group I) and 78 RC (Group II), and were followed up for 60 months. All patients were indicated for resynchronization therapy. Electrophysiology studies (EPS) were performed in cases with complaints of syncope and nonsustained ventricular tachycardia (VT). Induced sustained monomorphic VT cases were fitted with defibrillators. Statistical tests: Absolute and relative frequencies were obtained for the qualitative variables. For quantitative variables, some summary measures were calculated and box plots and survival curves constructed. The Chi-squared test was employed to identify associations among the qualitative variables. Quantitative variables were compared using Student's t test or variance analysis, and survival analysis performed by the Kaplan-Meyer test.

Results: Hospital deaths: 4 (7.3%); Deaths during follow-up: 52 (42.9%). No significant difference in survival between the two surgical groups (P = .693). All patients had FC III/IV at pre-op. Post-operatively, patients presented FC I 23.5%, FC II 52.9%, FC III 7.2%, and FC IV 5.9%. Mean EF was 26.7% ± 7.0% pre-op versus 40.7% ± 14.4% post-op.

Discussion: 76.4% of patients evolved from FC III/IV to FC I/II. Mean EF increased 14% in patients with FC I/II at post-op. There was a significant reduction in mortality compared to clinical treatment. No significant improvement in survival was observed in Group II although these patients showed a tendency to improve.

Conclusions: Treated patients had significantly lower mortality. Improvements in both FC and EF were observed. No significant difference in survival was seen between the 2 surgical groups.

SOP33—ANALYSIS OF INTRA-OPERATIVE PARAMETERS IN CHAGASIC PATIENTS USING AMIODARONE UNDERWENT PLACEMENT OF IMPLANTABLE CARDIOVERTER-DEFIBRILLATOR

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Faculty of Medical Sciences - Santa Casa de São Paulo, Heart Surgery Unit, São Paulo, Brazil

Objective: The objective of this study is to determine the existence of significant changes in intra-operative parameters of chagasic patients using amiodarone submitted to the implantation of cardioverter defibrillator (ICD).

Methods: Retrospective analysis was performed of 156 chagasic patients; 42 patients did not use amiodarone at the time of the surgery.

We analyzed the threshold stimulation (TS) and resistance (R) of the right atrium (RA) and right ventricle (RV), P waves (Pw) of the RA, R wave of RV (Rw), energy and impedance of defibrillation of patients chagasic with and without previous use of amiodarone at the time of implantation of the defibrillator, as primary and secondary prevention of sudden death.

Results: Currently the implant, the following average values were obtained for patients without use of amiodarone: RA: TS = 0.8 Volt (V), R = 556.5 Ohms (Ω), Pw = 3.0 ± 1.2 Milivolts (Mv); RV: TS = 0.5 V, R = 573.8 ± 110,1 Ω, Rw = 9.4 ± 3.6 Mv; defibrillation energy (DE): 15,0 Joules (J) and defibrillation impedance (DI): 42.0 Ω.

For patients using amiodarone, the average values are: RA: TS = 1.0 V, R = 500.0 Ω, Pw = 2.7 Mv; RV: L = 0.7 V, R = 593.1 ± 128.1 Ω, Rw = 9.0 Mv; DE = 15.0 J and DI = 44.0 Ω.

Comparing the averages obtained between the two groups, there was no significant differences for the right atrium (TS, R,

P wave), right ventricular (R, R wave), energy and impedance of defibrillation, with a significant difference only for stimulation threshold of the right ventricle ($P < .001$).

Parameters	Without amiodarone	With amiodarone	Significance ($P < .050$)
Right Atrium Stimulation Threshold	0.8 Volt	1.0 Volt	0.075
Right Atrium Resistance	556.5 Ohms	500.0 Ohms	0.067
P wave	3.0 mVolt	2.7 mVolt	0.231
Right Ventricle Stimulation Threshold	0.5 Volt	0.7 Volt	< 0.001
Right Ventricle Resistance	537 Ohms	593 Ohms	0.390
R Wave	9.4 mVolt	9.0 mVolt	0.936
Defibrillation Energy	15.0 Joules	15.0 Joules	0.081
Defibrillation Impedance	42.0 Ohms	42.0 Ohms	0.943
Ejection Fraction	33.5%	34.0%	0.648

[Means of Intra-operative parameters]

Conclusions: The use of amiodarone in chagasic patients shows statistically significant difference in stimulation threshold of the right ventricle, not interfering, however, in the proper functioning of CDI at the time of the implant.

SOP34—HISTOLOGIC AND CLINICAL PARAMETERS AFTER RETROBYPASS IN AN EXPERIMENTAL ISCHEMIA MODEL IN PIGS

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Background: In severe coronary artery disease without eligible target vessels, the perfusion of coronary veins may be an option to perfuse and nourish ischemic myocardium. In an experimental animal model lasting over 3 months we investigated clinical and histological effects in pigs and we hypothesize that retroperfusion of the V. inter-ventricularis anterior (VIVA) may compensate an acute RIVA occlusion in a pig model.

Methods: In 21 German Landrace pigs, retroperfusion of the VIVA was performed before ligation of the RIVA. The vein was ligated centrally and flow reversal was verified angiographically. 5 animals served as a control group where only the ligation of the LAD was performed. Hemodynamic and laboratory data were recorded. After three months, the animals were sacrificed; the hearts were explanted and examined histologically.

Results: The mean survival time of animals with retrobypass after LAD ligation was 101.3 days. Of 21 animals, 18 (86%) survived the experiments primarily. Long-term survival was 76% (16/21), whereas animals in the control group (n = 5) did not survive the ischemia of the LAD. The hemodynamic performance was significantly better in the retrobypass group than in the control (baseline, 4.8 + 0.9; Retrobypass, 4.3 + 0.7 L/min versus control, 1.9 + 0.8 L/min, $P < .05$). Histological follow-up studies showed significant lower area of necrosis in all animals of the RB+L+ group (subanalysis showed up to 5% apical infarction area whereas up to 30% in the control).

Conclusions: Acute RIVA occlusion can be compensated by perfusion of the VIVA which has to be ligated proximally. Venous retroperfusion is an effective technique to achieve hemodynamic stability and long term survival in a pig animal model.

SOP35—SURGICAL TREATMENT OF HOCM IN PATIENTS WITH EXTREME HYPERTROPHY AND SEPTAL MYOCARDIAL FIBROSIS

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Objectives: The mechanism of sudden death in HOCM is ventricular tachycardia/fibrillation emanating from areas of fibrosis. The classic Morrow technique for HOCM in patients with extreme left ventricular hypertrophy, right ventricular obstruction and myocardial fibrosis is not effective. A new technique of HOCM surgical correction in patients with severe hypertrophy and septal myocardial fibrosis was proposed.

Methods: The excision of the asymmetrical hypertrophied area of the interventricular septum (IVS) causing LVOT and RVOT obstruction simultaneously was performed from the conal part of the RV. This excision was carried out on the right side of the IVS and not trough the whole IVS thickness. The presented excision of IVS allows to avoid the damage to the right branch of the His bundle. The areas of septal myocardial fibrosis were removed corresponding to the zone of delayed enhancement (DE) imaging. 8 patients with biventricular obstruction, extreme hypertrophy (NYHA Class 3) and episodes of ventricular tachycardia (VT) underwent this procedure. Ages ranged from 18 to 35 years. The follow-up period was 38 ± 7 months.

Results: Six patients were free of symptoms (NYHA class 1) and two patients had only mild limitations. The mean echocardiographic LVOT gradient decreased from 89.9 ± 12.6 to 9.1 ± 2.2 mmHg, the mean value of gradient in RVOT was reduced from 43.4 ± 5.2 to 4.3 ± 1.3 mmHg. Echocardiographically determined septal thickness was reduced from 34.7 ± 3.1 to 15.6 ± 2.1 mm. Sinus rhythm without block of His bundle right branch was noted in all patients. VT was not registered.

Conclusions: This novel technique of HOCM surgical correction provides the precise removal of the areas of septal fibrosis and effective elimination of simultaneous LVOT and RVOT obstruction in patients with severe hypertrophy. A major advantage is that injures, in particular to the conduction system, are easily avoided.

SOP36—SURGICAL TREATMENT OF ABSCESS-FORMING INFECTIVE NATIVE VALVE ENDOCARDITIS A SINGLE CENTER EXPERIENCE

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Background: Due to the surgical challenge and high incidence of preoperative complications, abscess-forming native valve endocarditis forms a high risk group within endocarditis.

Methods: In the period during 1997 and 2007 data on 474 patients suffering NVE were recorded. Seventy-five patients (15.8%) showed abscess formations intruding the annulus or aortomitral continuity. Mean follow up time was 2.7 ± 2.1 years.

Results: More than two-thirds of the patients (n = 52) were at NYHA functional class 3 or 4 at admission and 80% (n = 60) suffered from a septic condition. Twenty patients (26.7%) had neurologic complications. Echocardiography showed in 88.3% (n = 66) vegetations, but could demonstrated the intraoperatively affirmed abscesses in only 50%. Approximately two-thirds (61.5%) were involving the aortic annulus, 38.5% the aorto-mitral continuity (n = 29). Most cases were emergency procedures (65.3%). Aortic valve was affected in 73 patients (97.3%), mitral valve in 23 patients (30.8%). Double valve procedure became necessary in 26.7%. All valves had to be replaced, reflecting mean patient's age of 54 ± 14 years in 84.0% by a mechanical prosthesis. Intraoperatively no patient died. Postoperatively 11 patients (14.7%) suffered from relevant bradycardia and received a permanent pacemaker. Within first 30 postoperative days 17 patients (22.7%) died, over-all mortality was 34.7%. Abscess-forming native valve endocarditis could be identified as a predictor for high 30-day mortality (22.7% versus 8.4% respectively, *P* = .029).

Conclusions: Abscess formations often indicates "end-stage" endocarditis with high rates of extensive preoperative morbidity. Due to this, the postoperative management seems to be more challenging than the surgical procedure itself, which is technical feasible in most cases.

SOP37—SURGICAL TREATMENT OF INFECTIVE NATIVE VALVE ENDOCARDITIS WITH ASSOCIATED NEUROLOGICAL COMPLICATIONS: A SINGLE CENTER EXPERIENCE

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Background: Treatment of patients suffering native valve endocarditis (NVE) with associated cerebral complications still remains a surgical challenge. Especially the management and timing of surgery has been part of controversial discussion previously.

Methods: Between 1997 and 2007, data on 474 patients suffering NVE were recorded. Sixty patients (12.7%) showed neurologic complications. Mean age was 55 ± 15 years, mean follow-up time 2.7 ± 2.1 years (98.1% complete).

Results: Neurologic complications consisting of TIA, PRIND or permanent stroke occurred in 60 patients (n = 60/474, 12.7%). Most patients suffered from stroke due to cerebral embolic events (n = 50/60, 83.3%). Seven patients (n = 7/60, 11.7%) had a hemorrhagic stroke and further three (n = 3/60, 5.0%) suffered cerebral abscesses. Clinical diagnosis was made by a neurologist and confirmed by CT-scan in all patients. Mean time interval between stroke and surgery was 8.7 ± 10.3 days. Twelve patients died within thirty days (n = 12/60, 19.5%), over-all mortality was 26.8% (n = 16/60). Preoperative stroke could be identified as a significant predictor for hospital mortality in comparison to patients without neurologic symptoms (19.5% versus 8.4% respectively, *P* = .0423). Nine patients (n = 9/60, 15.0%) demonstrated postoperative new onset neurologic events. Most of these (n = 4/9, 44.4%) were transient neuropsychiatric alterations, 22% (n = 2/9) were embolic events (confirmed by CT-scan) and 3 patients had convulsions (n = 3/9, 33.3%). We observed no impairment of preoperative neurologic status during the follow up.

Conclusions: NVE complicated by neurologic events remains a challenging disease with high mortality and morbidity. Surgical intervention is associated with acceptable rates of postoperative new onset neurologic symptoms and seems not to aggravate preoperative persisting neurologic complications.

SOP38—DOES COMBING PRE AND POST OPERATIVE VARIABLES IMPROVE PREDICTION IN CARDIAC SURGERY?

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Background: Scoring systems were introduced to intensive care medicine in order to offer the physician an objective tool for judging a patient's condition. They can be used to estimate the severity of a disease and for therapeutic decisions. The 'Cardiac Surgery Score' (CASUS) was developed by us in 2005 as a tool for daily risk stratification in patients admitted to the ICU after cardiac surgery. In this study we combined the preoperative 'European system for cardiac operative risk evaluation' (EuroSCORE) and the postoperative CASUS to the 'modified CASUS' to address this question.

Methods: All consecutive adult patients undergoing cardiac surgery between January 2007 and December 2009 were included in our prospective study. Both models were tested with calibration and discrimination statistics. We compared the ROC curves by DeLongs' method and calculated OCC values.

Results: 4054 patients with a mean age of 67.2 ± 10.9 years were admitted to ICU after cardiac surgery. The mean length of ICU stay was 4.6 ± 7.0 days and the ICU mortality was 5.8% (n = 235). Both models showed excellent discriminatory power without any significant difference. The best OCCs were on the second day (modified: 96.5%; original: 96.6%). No model showed any significant *P* value in calibration.

Conclusion: The additive CASUS and the modified CASUS are reasonable overall predictors. We could not detect any statistical superiority for modified CASUS in comparison to isolated postoperative additive CASUS. We therefore recommend a separate calculation of both scores. The EuroSCORE should remain as a pure preoperative risk system, whereas the additive CASUS serves excellent as an isolated postoperative model to predict ICU mortality after cardiac surgery.

SOP39—READMISSION AFTER CARDIAC SURGERY IN ELDERLY PATIENTS IS STILL ASSOCIATED WITH POOR OUTCOME

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Objectives: Improvement of surgical techniques and advancement of intensive care therapy led to increased number of older

patients with a higher risk profile scheduled to cardiac surgery procedures during the last decade. ICU readmission is believed to be associated with impaired clinical outcome. Clinical data and outcome of readmitted patients were analyzed and perioperative prognostic variables of ICU readmission evaluated.

Patients: A total of 5983 patients underwent CABG and/or valve or aortic surgery in our institution between 2007 and 2009. Among these, 576 patients elder than 80 years (mean age 82.1 ± 2.1 years; 51% male; logistic EuroSCORE 16.6 ± 13.4) were reviewed retrospectively. The reasons for readmission and the postoperative course were analyzed. Furthermore, perioperative risk factors for readmission were determined by multivariate regression analysis.

Results: 576 patients were discharged from the ICU, 7.8% (n = 45) of these patients required a second stay in the intensive care. The readmission rate was 6.1% following CABG, 8.2% following isolated aortic valve replacement (AVR) and 10.0% following combined valve procedures or aortic surgery ± CABG (P = ns). Of the patients who were not readmitted, 6.6% died in hospital compared to 26.7% after readmission (P < .0001). After readmission, the mean length of stay in hospital was 24.3 ± 18.1 days and 13.5 ± 8.3 days for all other patients (P < .0001). Main reasons for readmission were respiratory failure (35%) and cardiovascular instability (25%). Multivariate logistic regression analysis revealed postoperative renal failure and respiratory insufficiency as independent predictors for readmission.

Conclusions: Readmission to ICU in elderly patients is associated with poor outcome, irrespective from the operative procedure. Respiratory complications were the most common reasons for readmission. Predictive renal and pulmonary risk factors indicate the particular need of preoperative preconditioning and patient selection.

SOP40—A NEW METHOD FOR PREVENTION OF WOUND INFECTION AFTER MEDIAN STERNOTOMY

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Objective: Infection of the median sternotomy wound after cardiac surgery can be a serious complication causing mortality and morbidity and increased hospital costs. The reported rate of sternal wound infection (SWI) after median sternotomy varies between 0.75 and 10.1%. Obesity is one of the common risk factors for SWI. In obese patients and women with pronounced breast size the development of skin dehiscence after median sternotomy is favored because of the enormous tension on the wound. This results in an increase in wound infections through penetration of skin flora to deep tissue layers.

Methods: At our institution we successfully applied a new vacuum-sealed dressing (Prevena™ Incision Management System, Kinetic Concepts, Inc., San Antonio, Texas) in 19 obese patients with BMI ≥ 35kg/m² (range 35-62 kg/m², mean 40.4 ± 6.4 kg/m²). The main criteria for application of this dressing were obesity and large breast size in obese females. Mean age of the patients was 67.8 ± 7.8 years; 6 were male and 13 female. Wound closure was performed in standard technique. The vacuum-sealed dressing was applied in the operating room immediately after skin suture. Wound assessment and documentation was performed after removal of dressing (after 6-7 days) and before discharge of the patients from hospital.

Results: Primary wound healing was achieved in all 19 patients. None developed either deep or superficial wound infection. One patient with BMI of 62 kg/m² developed slight dehiscence of the corpus sterni, without signs of wound infection and need of surgical treatment. No patient's hospital stay was extended due to SWI.

Conclusion: We recommend use of the Prevena™ Incision Management System to prevent wound infection in obese cardiac surgery patients after median sternotomy, as it supports tension-free and primary wound healing. It can clearly lead to a reduction of SWI in obese patients.

SOP41—ARTERIAL CONDUIT FUNCTION ASSESSMENT AS IMPORTANT FACTOR FOR PREDICTION OF SUCCESSFUL WEANING FROM IMPELLA LEFT VENTRICULAR ASSIST DEVICES

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Background: Comparative studies to predict success of Impella weaning in patients suffering from cardiogenic shock were performed on the basis of standard invasive and non-invasive and new wave intensity (NWI) parameters which assess the function of arterial conduit.

Methods and Results: Between 08 Mar. 2001 and 18 May 2009, 59 patients were treated by Impella implantation. Study group consisted of 14 of these patients (12 men, age 60.7 ± 9.5 years). The patients received echocardiographic assessment, NWI study from carotid artery and hemodynamic recording during weaning trials. Weaning was performed by stepwise reduction of flow from maximal to 2.5 L/min and then to zero flow.

The NWI index materializes as the curve consisting of two mathematically defined peaks The 1st peak is related to contractility and the 2nd to diastolic function; relation of 1st to 2nd peak reflects state of conduit filling. The NWI results from the formula (dU/ d t) • (dV Doppler/ dt), where dU = difference in displacement of carotid artery indicating continuous pressure wave and V = instantaneous flow velocity measured by Doppler produced by stroke volume.

The patients who could be successfully weaned from Impella were characterized by statistically significantly higher 1st and 2nd peak of NWI (8790 ± 2824 and 3547 ± 2375 mmHg*s³) than the 6 patients who could not be weaned (3.210 ± 1325 and 593 ± 512 mmHg*s³, P = .009 and .002, respectively). The patients who could not be weaned received continued assist device support to save their lives.

A less powerful predictor of successful weaning was CVP (mmHg) of 13 ± 2.3 in the weaned group. versus 16 ± 2.3 (P = .02), good PCP (mmHg) of 18 ± 2.3 versus 16 ± 2.3, for both P = .001, and CO (L/min) of 2.8 ± 0.35 and 2.1 ± 0.31, P = .003

Conclusions: New ventricular-arterial coupling parameter of WI 1st and 2nd peak can potentially be used to distinguish patients who can be safely weaned from the Impella device following myocardial recovery.

SOP42—INFLUENCE OF PREVIOUS PERCUTANEOUS CORONARY INTERVENTION ON IN-HOSPITAL MORTALITY AFTER CORONARY ARTERY BYPASS SURGERY IN PATIENTS WITH MULTI-VESSEL CORONARY ARTERY DISEASE

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Introduction: The number of percutaneous coronary intervention (PCI) has increased as the initial revascularization strategy in chronic coronary disease. Consequently, more patients undergoing coronary artery bypass grafting (CABG) have history of coronary stent placement.

Objective: We sought to evaluate the influence of previous PCI on in-hospital mortality after CABG in patients with multi-vessel coronary disease.

Method: Between May 2007 and June 2009, 1099 consecutive patients underwent first time isolated CABG with cardiopulmonary bypass. Patients with no PCI (n = 938; 85.53%) were compared with patients with previous PCI (n = 161, 14.65%). Patients who underwent PCI and CABG during the same admission were excluded. Preoperative risk factors were analyzed with respect to the variables definitions given by EuroSCORE and 2000 Bernstein-Parsonnet score. Logistic regression models and propensity score matching analyses were used to assess the risk-adjusted impact of previous PCI on in-hospital mortality. A second analysis was performed with the subgroup of diabetic patients (n = 520).

Results: Both groups were comparable, except that patients with previous PCI were more likely to have instable angina (16.1% versus 9.9%, *P* = .019). In-hospital mortality after CABG was higher in patients with previous PCI (9.32% versus 5.12%, *P* = .034). Using multivariate logistic regression analysis, previous PCI emerged as an independent predictor of postoperative in-hospital mortality (odds ratio 1.94, 95% CI 1.02-3.68, *P* = .044) as stronger as diabetes (odds ratio 1.86, 95% CI 1.07-3.24, *P* = .028). After computed propensity score matching based on eight preoperative risk factors to control selection bias, in-hospital mortality remained higher among patients with previous PCI (odds ratio 3.46, 95% CI 1.10-10.93, *P* = .034). The subgroup of diabetic patients with previous PCI also had higher postoperative in-hospital mortality (9.86% versus 6.68%, *P* = .33).

Conclusion: Previous PCI in patients with multi-vessel coronary disease independently increases the risk for in-hospital mortality after CABG.

SOP43—IMPACT OF THE USE OF STATINS IN ATRIAL FIBRILLATION PATIENTS' SUBMITTED TO SURGICAL MYOCARDIUM REVASCULARIZATION

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Objectives: To assess the impact of preoperative use of statins in reducing atrial fibrillation in the postoperative period of patients' submitted to the surgical myocardium revascularization and identify the determinant risk variables of postoperative cardiac rhythm.

Method: Observational study, of cohort type. Analyzed 198 patients, operated between 2004 and 2008, stratified in two studies samples being the first group G1 formed by patients who received statins in the preoperative period (141) and the second group G2 formed for patients who didn't receive statins (57). Analyzed 46 clinical, hemodynamics and surgical variables. The statistical analysis was performed by qui-square, t test for independent samples, and multiple logistics regression. Significance level of 5%.

Results: The main responsible variables for the determination of the postoperative cardiac rhythm were: dislipidemia 1.5%, weight 12.8%, and preoperative cardiac rhythm 85.7%. Vide tables 1 and 2.

Table 1. Socio demographic variables

VARIABLE	G1- WITH STATIN	G2- WITHOUT STATIN	*P* VALUE
Nº OF PATIENTS	141	57	
GENDER			0.399
FEMALE	42 (21%)	21 (11%)	
MALE	99 (50%)	36 (18%)	
AGE	60.95 ± 9.46	59.03 ± 10.62	0.215
WEIGHT	71.47 ± 13.70	76.00 ± 14.26	0.040
HEIGHT	1.63 ± 0.08	1.61 ± 0.09	0.293
BODY MASS INDEX	26.87 ± 4.47	28.37 ± 4.93	0.075

Table 2 - Cardiac rhythm and hospital mortality.

VARIABLE	G1- WITH STATIN	G2- WITHOUT STATIN	*P* VALUE
Preop. card rhythm			0.230
Sinusal	122 (62%)	53 (27%)	
Atrial fibrillation	19 (10%)	4 (2%)	
Postop. card rhythm			0.025
Sinusal	88 (44%)	45 (23%)	
Atrial fibrillation	53 (27%)	12 (6%)	
Hospital mortality			0.403
No	131 (66%)	51 (26%)	
Yes	10 (5%)	6 (3%)	

Conclusions: The preoperative use of statins decreased in a significant way the incidence of atrial fibrillation in the postoperative period in patients' submitted to surgical myocardium revascularization ($P = .025$, IC 95% = 0.021 to 0.310). The risk determinants factors of the postoperative cardiac rhythm were: weight, dyslipidemia, and preoperative cardiac rhythm.

SOP44—FAILURE TO RESCUE AS A MEASURE QUALITY OF CARE IN A CARDIAC SURGERY RECOVERY UNIT

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Background: Failure to rescue (FTR), which is defined as the probability of death after a complication that was not present on admission to a health care facility, is a measure of hospital quality of care that has been growing in popularity.

The objective of this study is to determine the trends in FTR in a cardiac surgery recovery unit.

Methods: The study cohort included 4978 consecutive patients who underwent cardiac surgery from April 2005 to March 2010. Data on these patients were collected prospectively. Baseline logistic regression models for mortality and for death and any of the 10 major complications were created. Frequency distributions of morbidities were determined and FTR was calculated by dividing the number of patients who died secondary to a complication by the total number of patients who developed that complication. The annual FTRs were compared using chi-squared test. Subgroup analyses calculating the FTR by the type of procedure were also performed.

Results: The overall mortality rate was 3.6%, the complication rate was 16.8% and the FTR was19.8% (95% CI: 14.6%, 20.0%). The predicted risk of mortality ($P = .047$) and of major complications ($P = .015$) increased during the last two years of the study; the observed mortality was unchanged ($P = .15$) whereas the observed complication rate was lowest in year 5 ($P = .007$). FTR for new renal failure requiring renal replacement therapy, was the highest (48.4%; 95% CI, 37.8%, 58.3%) followed by septicemia (42.6%; 95% CI, 28.3%, 57.8%).The annual FTR did not vary significantly throughout the 5 year study period ($P = .36$).

Conclusion: FTR should be monitored and reported in addition to mortality and major complication rates as a quality measure in postoperative cardiac surgical care. Major complications such as new renal failure and septicaemia still have a high FTR and should be targeted by quality improvement efforts.

SOP45—IMMEDIATE RESULTS OF HEART VALVE SURGERY IN PATIENTS WITH LOW EJECTION FRACTION OF LEFT VENTRICLE

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Background: To estimate efficiency and safety of operation of heart valve surgery in patients with left ventricle dysfunction.

Methods: From 1999 to 2010 there were 216 patients with low (≤50%) left ventricle ejection fraction underwent for cardiac surgery because of heart valve disease. In these patients coronary artery disease was completely excluded. There were 136 men (62.96%); mean age 49.3 ± 10.9 years (range 18-74). Before operation 65.3% of patients had III and 31.5% IV class NYHA. Lesions were of rheumatic origin in 57.8%, infective endocarditis 13.9%, degenerative 12.5%, congenital 8.8%, dysplastic 1.4%, prosthesis dysfunction 5.1%, and posttraumatic 0.5% of cases. History of previous cardiac operations was in 21.3%.Patients were divided into 3 groups according to predominate lesion: mitral (50.5%), aortic (28.2%), and combined (21.2).

Results: Hospital mortality was 4.6% (acute heart failure in 5 cases, multiorgan failure in 2 patients, intraoperative hemorrhage in 2 patients, and stroke in 1 patient). Early postoperative period complicated with heart failure (14%), multiorgan failure (8.3%), pleural hemorrhage (4.9%) surgical site infection (3.4%), stroke (4.4%), and pacemaker insertion in 1.9%. Left ventricle ejection fraction and intracardiac hemodynamics improved in all survivors.

Conclusions: Heart valve surgery in patients with systolic left ventricle dysfunction is characterized with satisfactory immediate results.

Short Oral Presentation IV

WEDNESDAY, JUNE 15, 2011, 14:40 – 16:20 H

SOP46—MINIMALLY INVASIVE AORTIC VALVE REPLACEMENT AS FIRST CHOICE IN ELDERLY PATIENTS: A PROPENSITY SCORE ANALYSIS

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Objectives: Elderly patients referred for cardiac surgery are often a challenging group as they are at increased risk of postoperative adverse events, especially in presence of severe co-morbidities. Recent studies have shown excellent results in terms of clinical outcomes in patients undergoing minimal invasive aortic valve replacement (MIAVR). However, the effects of MIAVR on elderly have not been well described. Aim of our study was to evaluate early outcomes and midterm follow-up in patients undergoing MIVAR.

Methods: Of 279 patients over 75 years old undergoing AVR from January 2004 to July 2010, 96 (35%) received MIAVR (62 right upper mini-thoracotomy and 24 mini-upper sternotomy). Of these, 85 patients (MIAVR group: 55 right mini-thoracotomy and 30 mini-sternotomy) were matched to a control group (median sternotomy) by propensity score analysis.

Results: Preoperative baseline characteristics were similar in both groups. Mean age was 79.6 ± 3.5 years with a median

logistic EuroSCORE 11 (6.5-14.3). Overall in-hospital mortality was 1.8% (3 patients) with no difference between the two groups. MIAVR was associated with a lower incidence of postoperative atrial fibrillation (24% versus 39%, OR 0.5, 95%CI 0.32-0.78, *P* = .001) and blood transfusions (25% versus 45%, OR 0.59, 95% CI 0.38-0.90, *P* = .01). Moreover, patients undergoing minimally invasive surgery had a shorter ventilation time (8 versus 10 hours, *P* = .002) and postoperative length of stay (6 versus 7 days, *P* = .02). At a medium follow-up of 25 months (10-41), survival was 93.5 ± 3% in the MIAVR versus 90.4 ± 4% in the control group (*P* = .6).

Conclusions: MIAVR in patients over 75 years old is a safe procedure associated with lower incidence of postoperative morbidities and faster recovery. Therefore, according to our data, MIAVR might be proposed as the first option for elderly patients.

SOP47—THE ELLIPTICAL GEOMETRY OF THE NORMAL HUMAN AORTIC VALVE: IMPLICATIONS FOR AORTIC ANNULOPLASTY RING DESIGN

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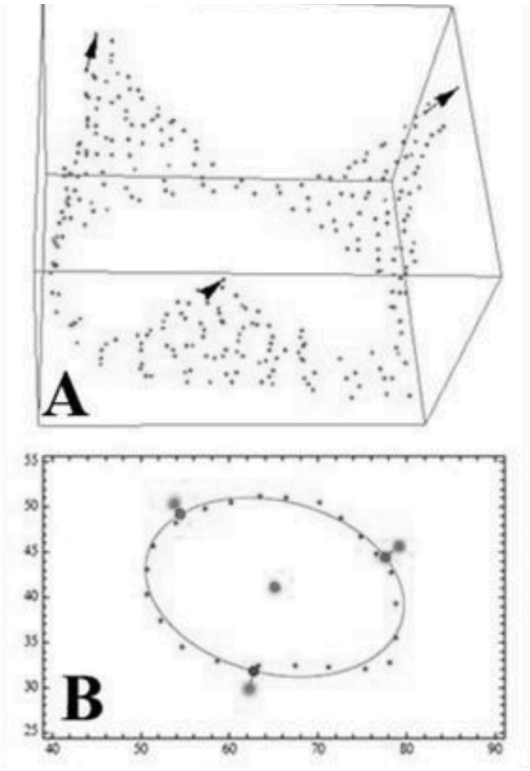
Objective: Repair of tri-leaflet aortic valves with insufficiency is becoming routine, but concern exists about the long-term fate of suture commissural annuloplasty. This study assessed the geometry of normal human aortic valves with a goal of designing a complete aortic valve annuloplasty device.

Methods: High-resolution aortic root CT angiograms were obtained from 10 random patients undergoing coronary screening. Axial images were constructed at 1mm intervals and then converted to bitmap files. Using Mathematica, x, y, z dimensional coordinates of the aortic valves were generated. Employing a refined "Hemispherical" model and 3-dimensional least squares regression analysis, leaflet-sinus complexes were analyzed as hemi-ellipsoids nested within an elliptical aorta. The mathematical junction of the leaflets and aorta was used to define 3-dimensional annular geometry.

Results: Normal annular geometry could be described as a 3-pointed coronet (Figure). In panel A are the 3-dimensional coordinates of the annular and sub-annular regions, and in panel B is the least squares elliptical fit of the annular base for a representative patient, along with points at the bottom and top of each commissure. Annular shape was quite elliptical with an average minor-major diameter ratio of 0.66. The commissure between the non-coronary and left-coronary cusps always was located at the posterior minor diameter, and the center of the right coronary cusp was positioned opposite. The average distance on the circumference between all 3 commissures was similar (*P* = .57), and the sub-commissural areas flared outward by 5-10º from the base. Commissural height was approximated by the radius of a circle with equivalent circumference.

Conclusions: The annulus of the normal aortic valve is quite elliptical with an appreciable outward commissural flare. Restoring size and shape of the entire annulus with a fixed annuloplasty ring based on this design has the potential of enhancing stable reconstruction of tri-leaflet aortic valvular insufficiency.



SOP48—A NEW TECHNIQUE TO ENLARGE SMALL AORTIC ROOT BY AORTIC FLAP

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Objective: To enlarge small aortic root using aortic rotation flap instead of Dacron, Homograft, or Pericardium. Authors describe preparation and use of such flap, with added advantages over currently used techniques.

Methods: Between December 2008 and January 2011, 86 patients underwent Aortic Valve procedures, in 48 males and 38 females, age ranging from 14 years to 69 years with mean of 37.5 years. Six patients had small aortic root, ranging 14 to 17 mm, 4 males and 2 females. Mean age is 32.5 (Range 18 to 58 years). Mean weight is 54 kgs (33 to 73 kgs). Each patient had careful echocardiography to assess the size of the aortic annulus. The ascending aorta was measured 1.5 cms above the annulus. Operative technique consists of cardiopulmonary bypass, aortic cross clamp and opening of ascending aorta, 1.5 cms above right coronary ostium. Cardioplegia was given through the coronary ostia or retrograde through coronary sinus. The aortotomy is fashioned in such a way that an aortic flap measuring 2.5 x 2 centimetre, is created in a semilunar form opposite to the Non coronary commissure. Aortic valve is excised and annulus is remeasured. The right commissure is opened up to mitral annulus and the aortic flap is sutured in neoannulus, using continuous 4-0 prolene continuous and few interrupted pledgetted sutures.

Results: Annulus was enlarged by 5 and 7 mm in diameter, allowing implantation of 2 size up valves (19-23). There was no early or late mortality. Patients are free from haemolysis, periprosthetic leak or valve related thromboembolic events in follow-up of 2-18 months, total of 97 patient years.Mean Gradient across Valve and supra-annular area of Aorta was low.

Conclusion: Aortic flap is an easy alternative to pericardium, homograft or Dacron to enlarge small aortic root, is easy to handle and stitch.

SOP49—TRANSCATHETER AORTIC VALVE IMPLANT: ACTUAL RESULTS OF A NEW BRAZILIAN PROSTHESIS

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Objective: Aortic valve replacement is a routine procedure with acceptable risk, but in some cases, such risk can justify contraindication. Minimally invasive transcatheter aortic valve implantation has emerged as an alternative, with lower morbidity and mortality. The aim of this study was clinical, safety and efficacy assessment.

Method: Thirty-three high risk patients underwent transcatheter balloon expandable aortic valve implantation. Mean Logistic EuroSCORE was 39.30% and STS score 30.28%. Eight patients presented with dysfunctional bioprosthesis, remaining ones presented calcified aortic stenosis. Procedures were performed in a hybrid OR under fluoroscopic and echocardiography guidance. Using a left minithoracotomy the prosthesis were implanted trough the ventricular apex under rapid ventricular pacing or hemorrhagic shock. Echocardiograph and angiograph controls were performed.

Results: Implant was feasible in 30 cases. Three conversions occurred. There was only 1 case of operative mortality. Median transvalvular aortic gradient reduced from 43.58 mmHg to 10.54 mmHg. Left ventricular function improved in the first 7 post operative day. Paravalvular aortic regurgitation was mild and present in 30.30%. One case presented major vascular complication and another one definite pacemaker implant. One major stroke case occurred. Overall 30-day mortality was 18.18%.

Conclusion: The transapical implantation of catheter-mounted bioprosthesis is a safe procedure with acceptable mid term results. Hemodynamic behavior is superior to the described for conventional prosthesis. Long term follow-up with increased sample power is mandatory in order to access hemodynamic, life quality and survival.

SOP50—THE EFFECT OF RETROGRADE AUTOLOGOUS PRIMING OF THE CARDIOPULMONARY CIRCUIT ON TRANSFUSION REQUIREMENTS; DO WOMEN BENEFIT MORE THAN MEN?

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Introduction: Cardiopulmonary Bypass (CPB) using Retrograde Autologous Priming (RAP) ameliorates hemodilution caused by asanguinous priming, reducing the need for peri-operative blood transfusion. Female patients, in general have a greater transfusion requirement than men. We hypothesised this technique may, therefore offer women the greatest benefit. We have retrospectively examined our early experience of RAP.

Methods: Forty-five patients who underwent coronary revascularisation with RAP (Group A) between April 2009 and October 2010 were compared to 45 matched controls receiving standard CPB (Group B). All operations were performed with moderate hypothermia and cold blood cardiologic arrest. Haemotalogical data obtained at 3 different time points during CPB, perioperative transfusion, and outcome data were analysed.

Results: The groups were matched with respect to their comorbidities and euroscore (4.88 ± 3.27 versus 4.31 ± 2.83, $P = .38$), except a preponderance of women in group A (13 versus 9). Preoperative haemoglobin values were similar (12.13 ± 1.27 versus 12.01 ± 1.31, $P = .67$) with no differences among the genders as was the lowest haemoglobin value on CPB between groups (7.27 ± 1.27 versus 7.22 ± 1.22, $P = .85$). The post bypass haemoglobin was significantly higher in Group A (8.20 ± 1.32 versus 7.51 ± 1.18, $P = .015$) in spite of the longer bypass time (144.61 ± 38.51 versus 56.79 ± 25.49, $P < .01$) and cross clamp times (94.70 ± 31.26 versus 33.51 ± 16.22, $P < .01$) in the group. Intraoperative use of blood products was comparable. Postoperatively transfusion requirements were 13 (29%) in group A versus 17 (38%) in group B ($P = .20$). The number of females receiving transfusion was 4 (33%) and 5 (55%) respectively ($P = .08$). Postoperative outcomes including re-exploration rate and ITU stays were similar.

Conclusions: Routine use of RAP did not reduce transfusion requirement postoperatively compared to the controls. Subgroup analysis however, shows that female patients may benefit by a reduction in transfusion rate approaching statistical significance. These potential benefits, especially in the female cohort require validation in a larger study.

SOP51—PROSTHETICS WITH KEMCOR DIEPOXY BIOPROSTHESIS FOR PATIENTS WITH INFECTIVE ENDOCARDITIS ON MITRAL VALVE

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Objective: To generalize stored by us experience of prosthetics mitral with bio prosthesis - KemCor diepoxy.

Methods: From 1999 to 2010 there were operated 73 patients with infective endocarditis. Mean age was 48.7 ± 8.3 years (in the range from 18 to 73). Before operation the majority of patients were in classes NYHA III (71.5 %) and IV (16.5 %). At 39 patients (53.4 %) the streptococcal etiology of endocarditis revealed.

Results: The mean follow-up was 65.3 ± 11.7 months. We observed 44 patients (62.8 %). At 85% of patients it was marked I and II class NYHA. Results of late follow-up echocardiography have shown good function of the valve mean gradient of pressure of 4.2 ± 1.2 mmHg, effective orifice area of 3.2 ± 0.4 cm^2 for all sizes of the valve was observed positive left ventricle remodeling. Early mortality was 2 patients (2.7%). Late mortality was 3 patients (4.1%). Two women at the age of 60 and 64 died for acute heart failure and the 44-year-old man died at 4 months after reoperation due to recurrent fungal endocarditis. Within 12 years freedom from the valve-related complications was 93.2% for endocarditis, 92.3% for thromboembolism, 90.6% for a thrombosis, 93.6% for structural deterioration of the valve and 85.4% for anticoagulant-related hemorrhage. Absence of necessity of reoperation was at 86.2% of patients.

Conclusions: By results of 12 years experience KemCor diepoxy is encouraging though on this problem the further researches are required.

SOP52—MINIMAL INVASIVE MITRAL VALVE REPAIR THROUGH RIGHT ANTEROLATERAL MINI THORACOTOMY: STANDARD OF CARE?

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Objectives: This study was conducted in order to compare our results upon mitral valve repair between minimal invasive surgery (MIS) and conventional surgery (CS).

Methods: Between 2002 and 2009 we operated 55 patients (43 male, mean age 55 years, 12 female, mean age 52 years) in MIS. 256 Patients (164 male, mean age 62 years, 92 female, mean age 69 years) were operated conventionally between 1998 and 2009. Following main methods were applied: Ring anuloplasty in 96% (93% in CS), chordae replacement in 64% (35% in CS), quadrangular resection of the posterior leaflet in 64% (39% in CS). Modified Cryo-maze procedure was applied in 9% (18% in CS).

Results: 4% of the patients in MIS and 5% in CS had to be reoperated because of bleeding. 2% of the patients in MIS and 0.5% in CS had to receive a mitral valve replacement because of endocarditis. 4% of the patients in MIS and 9% of the CS group finally had to receive a permanent pace maker after developing a severe AV Block. 5% of the MIS group and 1% of the CS group suffered a minor neurology event with full recovery. 2% of both the patients in MIS and CS suffered a stroke. No early mortality was noticed in the MS group, 3% of the CS patients died during the first 30 days instead. No patient had to be reoperated in a follow-up period of 8 years.

Conclusions: Our data support the thesis, that the minimal invasive repair of the mitral valve provides a safe and reliable treatment of the isolated mitral valve regurgitation with either the same or even better results compared to the conventional method.

SOP53—LONG TERM FOLLOW UP AFTER AORTIC VALVE REPLACEMENT WITH EDWARDS PRIMA PLUS STENTLESS BIOPROSTHESES IN PATIENTS ≤60 YEARS

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Objectives: The Edwards Prima Plus (EPP) was one of the first stentless aortic valve bioprostheses, showing larger orifice areas and improved hemodynamics compared to stented bioprostheses. The aim of this single-centre retrospective study was to assess long-term results of the first EPP in patients ≤60 years.

Methods: From 1993 to 2001, 120 (99 male and 21 female) patients ≤60 years underwent implantation of EPP. Indications were stenosis and/or insufficiency. Associated procedures were performed in 38 patients (31.7%). 39% of patients had impaired left ventricular function. Follow-up data were acquired by telephone interview. Time-to event analyses were performed by the Kaplan-Meier-method. Variables affecting survival and freedom-from-reoperation were evaluated by Cox regression. Mean age of patients at surgery was 53.1 ± 8.0 years. Follow-up was 88.8% complete at a mean of 8.5 ± 4.5 years. Total follow-up was 1022.7 patient-years with a maximum of 17.0 years.

Results: At 10 and 15 years, overall actuarial survival-rate was 71.8% ± 4.4% and 48.8% ± 9.6%. Higher age, aortic insufficiency as cause of operation and small prosthesis size (23/25mm compared to 27/29mm) significantly lowered survival. Reoperation was performed in 20 patients (16.7%). At 10 and 14 years overall freedom-from-reoperation was 85.6% ± 3.7% and 65.2% ± 8.6%. Patients with small prosthesis sizes and insufficiency as cause of operation had a significantly lower freedom-from-reoperation.

Conclusion: In patients aged 60 and younger EPP provides reliable long-term results. Freedom-from-reoperation is at least comparable to stented bioprostheses.

SOP54—LEFT VENTRICULAR ANEURYSMECTOMY WITH CONTINUOUS BEATING HEART: THE BEST PROTECTION?

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Objective: The purpose of this study was to evaluate immediate results of left ventricular aneurysmectomy without aortic cross-clamp, with continuous beating heart as a cardioprotective method.

Methods: Sixty-five patients underwent repair of left ventricular aneurysm with mean age 52 years old. There were 58% percent male. The predominant indication for operations was congestive heart failure in 86%, isolated or in association with angina, arrhythmia or embolism. The mean left ventricular ejection fraction was twenty nine percent; functional class, according New York Heart Association, was III or IV in 72%. Sixty-two percent of patients presented with dyskinetic scar and 38%, akinetic scar. Fifty-eight percent were operated on aneurysmectomy associated with coronary artery bypass graft (CABG), which was performed first, off pump, with intracoronary shunt. Forty-two percent were

operated on isolated aneurysmectomy.

Results: The medium length of cardiopulmonary bypass was sixty five minutes. The intensive care unit length of staying ranged from 2 to 8 days. Ventilator assistance varied from zero, when patient was extubated at operating room, to 96 hours. The medium length of hospital staying was 12 days. Intra aortic balloon pump assistance was necessary in 6 patients. Vasoplegia was observed in 2 patients and coagulopathy in 1 patient. There were 2 operative deaths, 3.07%. One caused by pulmonary embolism and another as a result of failure of multiple organs and systems.

Conclusions: The technique of beating heart as a cardioprotective method in left ventricular aneurysmectomy allowed us to operate on very sick patients with low mortality. CABG, performed first, off pump, with intracoronary shunt avoided even though regional ischemia. We conclude that these two strategies perform the ideal cardioprotective method to treat ischemic left ventricular aneurysms.

SOP55—IMPACT OF GENTAMICIN-COLLAGEN SPONGE ON INCIDENCE OF STERNAL WOUND INFECTION IN HIGH-RISK CARDIAC SURGERY PATIENTS: A PROPENSITY SCORE ANALYSIS

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Objective: Prophylactic local antibiotic delivery to the wound site using an implanted, reabsorbable, gentamicin-containing collagen sponge is a strategy claimed to prevent sternal wound infection after cardiac surgery. The purpose of this study was to review our experience of using gentamicin-collagen sponge in cardiac surgery patients deemed high-risk for sternal wound infection.

Methods: From January 2007 to December 2010, gentamicin-containing collagen sponge was used in 107 patients deemed high-risk for sternal wound infection. Applying the propensity score, 97 patients with gentamicin-collagen sponge (Group I) were matched with 97 patients who did not receive the gentamicin-collagen sponge (Group II). All the subjects received routine intravenous antimicrobial prophylaxis. Postoperative wound infection rates were compared in addition to the routine outcomes. Information for the study was obtained from the cardiac surgical Patients Analysis and Tracking System (PATS) database and hospital records.

Results: The superficial sternal wound infection rate was 2.1% (2/97) in Group I and 6.2% (6/97) in Group II ($P = .01$). The deep sternal wound infection rate was similar (2.1% versus 3.1%, $P = .87$). There was no mediastinitis in the study population. In addition more patients in Group II received intra-aortic balloon pump (5.2% versus 2.1%, $P = .04$) and haemofiltration (7.2% versus 3.1%, $P = .02$). No side-effects were noted.

Conclusion: Gentamicin-containing collagen sponge is a useful adjunct to meticulous surgical technique and postoperative wound care in reducing the incidence of sternal wound infection in high-risk cardiac surgery patients. However, an adequately powered study is needed to validate the safety and efficacy of this strategy.

SOP56—THIRTY YEARS OF SURGICAL PROCEDURES IN CARDIAC PACING: ANALYSIS OF 18,656 OPERATIONS IN A SINGLE BRAZILIAN INSTITUTION

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Background: In recent years, the role of cardiac implantable electronic devices has expanded substantially due to new technological resources, expansion of its therapeutic indications or by ageing of the population.

Objectives: To evaluate the growth in the number of cardiac pacing procedures, the main trends and the rate of in-hospital mortality in a Brazilian referral center of Cardiac Pacing.

Methods: Using the Institutional Database, we conducted a systematic analysis of all cardiac pacing procedures performed between 1980 and 2009 divided in three periods: initial (1980-1989), intermediate (1990-1999) and current period (2000 to 2009). Analysis of variance, Bonferroni and chi-square tests were used for comparison between the periods.

Results: In 30 years, 18,657 procedures were performed, of which 11,076 (56.9%) were initial implants and 8400 (43.1%) were reoperations, with average mortality rate of 0.8%. The majority of procedures (88%) was performed to treat bradyarrhythmias, 5.8% for prevention of sudden cardiac death and 6.2% as cardiac resynchronization therapy. In the 1980s, were performed on average 238 procedures per year, increasing to 606 in the 1990s and to 1018 in 2000s, representing an increase of 155% between the three periods ($P < .001$). The main changes between the three periods are described in the table.

Conclusion: Our results showed a progressive increase in the number of procedures, especially in the more complex; changes in demographic and clinical profile, with increasing age of patients and reduction of Chagas' Disease; changes in operative techniques, with increased use of general anesthesia.

Variables	1980s	1990s	2000s	P
Age	47.4±25.1	60.1±20.7	63.8±18.2	< 0.001
High-degree AV block	76.7%	73.5%	53.9%	0.001
Chagas' Disease	30.5%	20.3%	9.7%	0.001
Local Anaesthesia / Sedation + local	96.2%	89.4%	77.6%	0.001
General Anaesthesia	3.8%	10.6%	22.4%	0.001
Lead position: apex or diaphragmatic wall	90.9%	85.3%	17.2%	0.001
Pulse generator pocket: left side	13.9%	11.3%	76.4%	0.001
Conventional PM	100%	92.2%	73.5%	0.001
Multisite PM	---	0.5%	13.1%	0.001

[Procedure changes between the three periods]

SOP57—ARE NURSE PRACTITIONERS (NPS) THE FUTURE OF RESIDENT COVER FOR CARDIAC INTENSIVE CARE UNITS (CICU)? AN UPDATED AUDIT

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Background: Statutory reduction in working hours and a shrinking pool of appointable candidates has created significant

pressure on provision of rotas for CICU cover.

Methods: We trained seven NPs to provide first line care on CICU. The 12-month training programme encompassed drug prescription (including inotropes), patient assessment, data interpretation and advanced life support including chest reopening. Learning outcomes were formally assessed. Competencies include insertion of central venous pressure lines, advanced airway management and resuscitation.

Results: In May 2010, following risk assessment, junior doctors became non-resident and NPs now provide first-line cover. Requests by NPs for medical assistance/advice were prospectively audited. Between May 2010 and February 2011, A total of 187 calls were made, of which 115 calls were sorted by telephonic advice, 72 calls resulted in medical staff attending the unit, mostly for bleeding 27%, hypotension 20%, low urine output 20%. There were 5 unheralded cardiac/respiratory arrests which were managed appropriately by the NPs with good outcome. There were no reported related adverse clinical incidents.

Conclusion: Radical changes to CICU resident medical cover seem inevitable. Our practice demonstrates a safe, viable alternative to traditional staffing models which then maximises training opportunities for surgical trainees.

SOP58—GASTROINTESTINAL COMPLICATIONS IN PATIENTS UNDERGOING OPEN HEART SURGERY: INFLUENCE OF COMORBIDITIES

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Objectives: Gastrointestinal (GI) complications occur in about 3-4% patients undergoing cardiac surgery and are associated with a huge mortality and morbidity. Broadly classified into 4 groups namely ischemic, hemorrhagic, paralytic ileus and others. The factors influencing development of gastrointestinal complications have not been well characterized. Understanding these can help better in risk stratification and early intervention of patients developing these complications

Methods: Retrospective analysis of 148 GI complications in 4518 patients undergoing open heart surgery between April 2004 and October 2009 in our unit, revealed an in hospital mortality of 37.3% and post discharge mortality of 10.1%.

Paralytic ileus was the commonest complication (40.54%) followed by others (25%), bleed (17.56%), and ischemic complications (17%). Laparotomy was required in 16.81% patients, endoscopic intervention in a further 6.7%, and 67.51% patients were managed conservatively. Around 8.9% patients were too sick to undergo any kind of surgery. The ischemic group had the highest mortality (88%) followed by bleed (38.5%), others (24.3%) and paralytic ileus (17.3%).

On univariate analysis male sex, blood and blood products usage, hypertension, presence of preoperative renal dysfunction, use of vasoconstrictor agents after surgery and inotrope requirements for more than 12 hours were predictive of mortality if patient developed GI complications. On regression analysis, the only positive factor predictive of mortality for patients GI complications was blood transfusion and blood product usage. Presence of diabetes mellitus, arteriopathy, preoperative GI problems, and smoking were not found to influence the incidence of GI complications

Conclusions: This study demonstrates the factors influencing the increased incidence of GI complications which can lead to high in hospital morbidity and mortality and also influence post discharge outcomes. It helps in better risk stratification of patients undergoing cardiac surgery.

SOP59—COMPARISON OF AMIODARONE AND PROPAFENONE FOR MAINTENANCE OF STABLE SINUS RHYTHM AFTER LEFT ATRIAL MONOPOLAR RADIOFREQUENCY ABLATION COMBINED WITH A MITRAL VALVE PROCEDURE IN PATIENTS WITH MITRAL VALVE DISEASE AND PERSISTENT ATRIAL FIBRILLATION

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Preoperative atrial fibrillation (AF) in patients scheduled for elective open-heart surgery is a well-known phenomenon. The Maze procedures abolish AF in 45%-95% of patients during short- to intermediate-term follow-up. The aim of this study was to assess the short and midterm results of using amiodarone versus propafenone for maintenance stable sinus rhythm after left atrial monopolar radiofrequency ablation combined with a mitral valve procedure in patients with mitral valve disease and persistent atrial fibrillation. The study included 50 patients (19 male , 31 female; age range: 54-82 years) who underwent a left atrial radiofrequency ablation procedure combined with mitral valve surgery between July 2008 and July 2010. All patients had isolated mitral valve disease. Patients were divided into two groups: Group 1 (propafenone, n = 25) and group 2 (amiodarone, n = 25).

Patients were follow up during 18 months. Data were collected at discharged from hospital and 3rd, 6th, and 18th month. Preoperative and intraoperative data were similar. There were no In-hospital mortality and morbidity .

In group 2, sinus rhythm was obtained in 68%, 52%, 60%, and 64% of patients ,

In group 1, sinus rhythm was obtained in 92%, 84%, 88%, and 88% of patients (discharged time 3rd, 6th, and 18th month results) ($P < .05$) Radiofrequency Maze ablation additional to mitral valve surgery resulted in a higher sinus rhythm conversion rate .

The achievement of stable sinus rhythm is a predictor of better survival and lower incidence of thromboembolic events. So, maintenance of stable sinus rhythm is very important for patients. Our study indicated that propafenone provided better results than amiodarone for stable sinus rhythm in early and midterm period after combined ablation and mitral valve surgery.

SOP60—TRANSAPICAL AORTIC VALVE IMPLANTATION: EXCELLENT RESULTS IN HIGH-RISK PATIENTS

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Objective: Transapical aortic valve implantation is a new approach for high-risk patients with severe aortic stenosis. We report our results in a very high-risk patient group.

Methods: Since April 2008, 350 patients (age 79 ± 8 years; range, 29 to 99 years) have been treated with transapical aortic valve implantation. The mean logistic EuroSCORE for the whole group was 38 ± 20% (range 4% to 97%) and the mean STS score 18 ± 15% [range 1% to 90%]. Combined planned additional procedures were performed in 40 patients: coronary stenting in 33 patients, LV aneurysmectomy in 3, tricuspidal valve reconstruction in 1, ASD II closure in 1, dilatation of the stenotic pulmonary valve in 1, and placement of a stent in the stenotic renal artery in 1.

Results: Technical success of the procedure was 98.8%. The hospital (30-day) mortality was 5.4% for the whole group. There was one new clinical neurological deficit postoperatively. Postoperative pacemaker implantation was needed in 6%. Multivariate analysis indicated solely cardiogenic shock as predictor for early death during the first 30 postoperative days. Cardiogenic shock, NYHA class, serum creatinine value, and EuroSCORE are independent risk factors for death between the 1st and 12th month postoperatively.

Conclusions: Transapical aortic valve implantation reduces operative risk in high-risk patients four to eight times in comparison to calculated operative risk of conventional aortic valve surgery.

SOP61—EFFECT OF GENDER ON EVEROLIMUS TREATMENT FOR ANTIBODY-MEDIATED REJECTION AFTER HEART TRANSPLANTATION

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Purpose: Women are known to present more often with acute cellular rejection after heart transplantation (HTx). However, the role of gender in antibody-mediated rejection (AMR) is unknown.

Methods: We prospectively studied 134 patients who underwent endomyocardial biopsy at 4 weeks (FU1 = 134), 1 year (FU2 = 107), and 3 years (FU3 = 61) after HTx. Acute cellular rejection (ACR, ISHLT grading) was evaluated in H&E stainings. AMR was assessed by immunohistochemistry (CD31-positive capillaries to CD68 and C4d; all x200). Immunosuppression consisted of CsA, everolimus or mycophenolate and steroids. Forty-three patients were continuously on everolimus during the first post-transplant year.

Results: ACR grade 1R was found in 21% of pts at FU1, in 11% of pts at FU2 and in 3% of pts at FU3. Grade 3R affected < 1% of pts in FU1 and was not detected in FU2 or FU3. AMR was present in 37% of pts at FU1, in 8% of pts at FU2 and in 10% of pts at FU3.

Women as compared to men were affected more frequently by ACR of any grade in FU1 (35% versus 20%; $P = .043$), FU2 (33% versus 8%; $P = .009$) and FU3 (22% versus 0%; $P = .020$). Women also presented more often with AMR than men in FU1 (60% vs. 33%; $P = .044$) and FU2 (21% versus 6%; $P = .073$), but there was no difference at FU3 (13% vs. 10%; $P = .600$).

Everolimus suppressed AMR in FU1 (25% versus 44%, $P = .041$), and this effect was more pronounced in women (29% versus 88%; $P = .035$) than in men (24% versus 34%; $P = .136$). However, AMR in FU2 and FU3 was equally frequent in everolimus-treated men and women.

Conclusions: Women present more often with AMR than men. Everolimus prevents AMR early after HTx, especially in female HTx recipients. Further study is necessary to determine gender and immunosuppressive effects beyond the first post-transplant year.

SOP62—NEW INSIGHTS IN THE BICUSPID AORTIC VALVE ASSOCIATED CARDIOVASCULAR MALFORMATIONS: THE ELONGATED ANTERIOR MITRAL LEAFLET

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Background: The bicuspid aortic valve is associated with various cardiovascular malformations, most predominantly with dilatation of the aortic root and ascending aorta. Aim of the present study was to examine the mitral valve morphology in patients with a bicuspid aortic valve.

Methods: Forty-four operated patients with BAV type I (L/R) (1 raphe between the left and right coronary sinus) and 40 operated patients with a tricuspid aortic valve (TAV) as well as 20 patients without cardiovascular manifestations were examined by means of preparative transthoracic echocardiography. The classification of the BAV was intraoperatively documented. In all patients the primary indication was aortic valve pathology (stenosis or regurgitation) and no patients with degenerative mitral valve pathology requiring operative correction were included.

Results: In BAV the anterior mitral leaflet (AML) was significantly enlarged in comparison to TAV and Normal subjects (33.2 versus 27.7 versus 22.0 mm; $P < .001$). No differences could be observed between BAV and TAV in terms of diameters of the aortic root components and body surface area. Regression analysis revealed that patients with BAV had significantly elongated AML ($P < .001$) even after correcting for the size of the mitral annulus and somatometric characteristics. Furthermore, patients with BAV and preoperative aortic valve insufficiency had significantly elongated AML (35.2 versus 31.0 mm, $P < .001$) even after correcting for mitral valve annulus diameter and somatometric differences.

Conclusions: Our results provide some evidence that the phenotypic alterations observed in BAV are not limited to the aortic valve or ascending aorta but may also involve the anterior mitral leaflet.

SOP63—SERUM MARKERS IN DECOMPENSATED HEART FAILURE: STUDY IN HEART TRANSPLANT AND ASSIST DEVICE CANDIDATES

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Objectives: Some patients with heart failure remain stable until a donor heart becomes available while others need mechanical circulatory support due to rapid hemodynamic deterioration. Several serum markers were found elevated in chronic heart failure, but it is unknown which marker may predict hemodynamic decompensation. We evaluated whether serum markers are indicative for hemodynamic impairment in heart failure patients.

Methods: In 30 patients with heart failure (26 male, 4 female, mean age 47 years) serum cardiac markers (troponin I, CK-MB, myoglobin), vasoactive mediators (big endothelin (big ET), endothelin-1 (ET-1), urotensin II (UT-II) and proinflammatory markers (procalcitonin (PCT) and ultrasensitive CRP (usCRP) were measured preoperatively at the time of heart transplantation or assist device implantation. Seventeen patients underwent left ventricular assist device implantation because of therapy-resistant heart failure (group I) and 13 patients heart transplantation in clinically stable condition (group II).

Results: None of the patients in group II were ventilated or needed inotropic support, whereas all patients in group I needed catecholamine therapy and some were mechanically ventilated preoperatively. The CK-MB (1.95 ± 1.1 versus 1.77 ± 1.4 µg/L) and troponin I (0.28 ± 0.2 versus 0.79 ± 1.2) concentrations (mean ± SED) were not significantly different between groups (group I versus group II). The serum concentrations of other markers are given in the table.

	Group I (n = 17)	Group II (n = 13)	*P*
Myoglobin (ng/mlL	137 ± 111	45 ± 14	< 0.01
PCT (ng/mlL	2.86 ± 7.2	0.07 ± 0.02	< 0.01
UsCRP (µg/mL)	78 ± 85	3.1 ± 3.8	< 0.01
UT II (pg/mL)	5134 ± 3540	2262 ± 1198	< 0.05
Big ET (fmol/mL)	3.6 ± 2.8	2.4 ± 1.5	n.s.
ET-1 (fmol/mL)	1.2 ± 0.77	1.3 ± 0.8	n.s.

Conclusions: Myoglobin, but not CK-MB or troponin I, was significantly increased in decompensated compared to stable heart failure. Elevated vasoactive mediators may predict chronic circulatory compromise in heart failure, whereas increasing of proinflammatory markers suggests an inflammatory involvement in hemodynamic deterioration of stable heart failure.

Abstracts Poster Exhibition

Adult Cardiac Surgery (Poster 1 – 98)

PE1—A NOVEL AND SAFE APPROACH TO COMPLEX ADULT CARDIAC SURGERY

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Objective: Peripheral cannulation is a technique which makes complex cardiac surgery safer, easier, and consequently beneficial for the patient in terms of post-operative recovery and stay.

It minimizes "space occupation" by large cannulae in the chest hence improving exposure and visibility and minimizing dissection and retraction. This reduces trauma to the heart and reduce the risk of intra- and post-operative haemorrhage.

It also contributes to myocardial protection by reducing mediastinal collateral flow, which tends to flush away cardioplegia.

Methods: Seventy-three patients underwent complex adult cardiac surgery between 2008 and 2009. The logistic Euroscore was 16%. The mean cardiopulmonary bypass and cross clamp times were 166 minutes and 102 minutes, respectively.

Characteristics of Patient Groups

Types of Procedure	Number of cases	Logistic Euroscore
Multiple procedures on the heart	39	15
Redo cases	16	26
Acute type A aortic dissection	6	19
Others	12	6

Femoral Arterial Cannulation: Arterial cannulation is achieved with a small horizontal incision (2-3 cm) and the DLP (Medtronic) cannula inserted percutaneously.

Femoral Venous Cannulation: The Smart venous cannula is inserted percutaneously without skin incision. The Smart canula® is collapsed over a mandrel prior to insertion and re-expanded in situ resulting in superior flow, much smaller access aperture, and less trauma result. This avoids the need for vacuum assist drainage and minimizes trauma to blood components in the bypass circuit. It particularly improves the venous drainage of the lower body and hence reduces the ischaemic risk to the gut and kidneys. Closure of the femoral vein in open cannulation can be difficult, and this technique avoids the problem.

Percutaneous SVC Cannulation: SVC cannulation is achieved using 15F Biomedicus cannula (Medtronic). All the cannulations above were guided by transesophageal echocardiography.

Results: The mortality rate was 6.8% (n = 5). There were no injuries to the heart for the redo cases. In addition there were no strokes or ischemic bowel complications.

Conclusions: Complex long adult cardiac cases can be done using peripheral bypass circuit resulting in good outcomes for this patients' group.

PE3—PULMONARY EMBOLISM. HOW OFTEN IS SURGICAL TREATMENT NECESSARY?

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Objectives: The aim of the present study is to evaluate how often is surgical treatment necessary in cases of pulmonary embolism, even though some indications for surgery exist.

Methods: The files of 54 patients treated to our department from 2006 to 2010 with proven pulmonary embolism were retrospectively examined.

Results: All patients were treated with thrombolysis. Mortality was zero, even in cases with massive pulmonary embolism, and there was no referral to a major cardiac surgery center for surgical treatment.

Conclusion: Surgical treatment of pulmonary embolism is rarely needed. Aggressive pharmacological therapy is fully therapeutic and effective in most cases.

PE4—EFFECT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE ON RESULTS OF OFF-PUMP CABG SURGERY AND MID-TERM FOLLOW-UP

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Objectives: We aimed to investigate risk factors affecting on the length of ICU stay, hospital stay and survival among patients with chronic obstructive pulmonary disease (COPD) undergoing off-pump CABG surgery.

Methods: Between January 2002 and December 2009, 337 patients underwent off-pump coronary artery bypass grafting (CABG) in our clinic. Twenty-six (6.9%) patients were with COPD. Non-categorical data were evaluated with t-test and categorical data were evaluated with Chi-Square and Fisher's exact test.

Results: Gender, peripheral vascular disease, previous stroke, low ejection fraction (<30%, ≥30-50%), urgent or emergent operation, use of IABP, postoperative atrial fibrillation, reoperation for bleeding, massive blood transfusion were factors prolonging length of ICU stay among patients with COPD ($P < .05$). Advanced age (≥70 years), peripheral vascular disease, urgent or emergent operation, prolonged inotropic support, use of IABP, postoperative atrial fibrillation were factors prolonging length of hospital stay among patients with COPD ($P < .05$). In follow-up, mortality rate was significantly higher among patients with COPD ($P < .05$). Smoking, diabetes, hypertension, advanced age (≥70 years), prolonged inotropic support were factors effecting survival among patients with COPD ($P < .05$).

Conclusions: Chronic obstructive pulmonary disease is an important risk factor affecting morbidity, mortality and survival among patients undergoing off-pump CABG surgery. Preoperative, operative and postoperative specific treatment is necessary for decreasing morbidity and mortality.

PE5—EFFECT OF GENDER IN LENGTH OF ICU STAY, HOSPITAL STAY AND SURVIVAL IN THE PATIENTS UNDERGOING OFF-PUMP CABG SURGERY

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Objectives: We aimed to identify the effect of gender as an independent risk factor length of ICU stay, hospital stay and survival in the patients undergoing off-pump CABG surgery.

Methods: Between January 2002 and December 2009, 337 patients underwent off-pump coronary artery bypass grafting (CABG) in our clinic. 25.2% of patients were female and 74.8% male. Non-categorical data were evaluated with t-test and categorical data were evaluated with Chi-Square and Fisher's exact test.

Results: Diabetes, hypertension, low ejection fraction (<30%, ≥30-50%) were more common among female patients ($P < .05$). Low ejection fraction (<30%, ≥30-50%), prolonged inotropic support, postoperative atrial fibrillation, reoperation for bleeding, massive blood transfusion were factors prolonging length of ICU stay among female patients ($P < .05$). Hyperlipidemia, preoperative atrial fibrillation, low ejection fraction (<30%, ≥30-50%), use of intraaortic balloon pump (IABP), postoperative atrial fibrillation were factors prolonging length of hospital stay among female patients ($P < .05$). Overall postoperative mortality rate was .05%. Smoking, hypertension, diabetes were factors shortening survival among male patients ($P < .05$). Previous stroke, low ejection fraction (<30%, ≥30-50%), prolonged inotropic support, prolonged ventilatory support, need for hemodialysis, postoperative renal insufficiency, postoperative atrial fibrillation were factors affecting postoperative mortality among male patients ($P < .05$). Mean follow-up was 55.16 ± 27.31 months. In follow-up, mortality rate was 5% in male and 1.1% female. Advanced age, COPD, postoperative atrial fibrillation were factors affecting mortality in follow-up among male patients ($P < .05$). Preoperative and postoperative renal insufficiency were factors affecting mortality in follow-up among female patients ($P < .05$).

Conclusions: In women, off-pump CABG surgery is now made with expectations of comparable results to those noted in men.

PE6—EFFECT OF AORTIC VALVE REPLACEMENTS ON LEFT VENTRICULAR END-DIASTOLIC DIAMETER PERFORMED ON PATIENTS WITH AORTIC INSUFFICIENCY IN WHOM LEFT VENTRICULAR FUNCTIONS WERE SEVERELY IMPAIRED

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Objective: In patients with significant left ventricular dysfunction, AR and prominent left ventricular dilation; aortic valve replacement is performed with a reasonable perioperative mortality rate.

Methods: In this study, 29 patients with aortic regurgitation and severely impaired left ventricular function that underwent aortic valve replacement between April 2001 and May 2003 were investigated. Preoperative and postoperative (1st, 12th, 36th, and 60th months) echocardiographic examinations were recorded. Inclusion criteria of these patients were; diagnosis of severe aortic regurgitation during preoperative period, LVESD >50 mm, LVEDD > 70 mm and an ejection fraction (EF) < 40%. Mean LVEDD of these patients was 80.7 mm, and mean EF was 34%.

Results: In evaluation of the mean LVEDD values of the patients, statistically significant difference was found among follow-up periods ($P = .001$ $P < .05$). To assess between what follow-up periods this difference was, Bonferroni method was used. It indicated that mean preoperative values were significantly higher than that of 12th, 36th, and 60th months ($P < .05$).

Conclusion: Aortic valve replacement performed on patients with severely impaired left ventricular functions and AR reduces the left ventricular diameters significantly.

PE7—OUR EXPERIENCE WITH TTK-CHITRA PROSTHETIC HEART VALVE

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Objective: To study the complications of TTk-Chitra prosthetic valve which has monolithic frame of Chrome Cobalt Alloy with occluder made of biocompatible Ultra High Molecular Weight Polyethylent, sewing ring made from implant tested 100% Polyester fabric.

Methods: Between December 2008 and January 2011, 156 patients, 76 males and 80 females, 16 to 76 years (Mean 36.5), had 179 TTK-CHITRA Prosthetic Valve implantations. Seventy-eight patients underwent mitral valve replacement, 40 had aortic valve replacement, 38 had both aortic and mitral, 15 also had mitral valve repair, 12 had other concomitant procedures. There were 3 hospital deaths (2%) due to low cardiac out put and 2 late readmission deaths (1.3%) after discharge, related to severe cardiac dysfunction (1), aortic embolism (1), none related to valve .

Only one patient had mild haemolysis related to Perivalvar leak subsided subsequently. Atrial Fibrillation was present in 12%, were put on amiodarone routinely, was considered a risk factor for embolism. International normalised Ratio was maintained at 2-2.5 for Mitral, 2 for Aortic, and 3 for Double Valves.

Results: One fifty One patients are in regular follow up with INR and Echocardiaography, gradient across valve ranged from 4 to 6 mm of Hg in mitral position and 16 mm of Hg in Aortic position. There was no pannus formation in both positions, Patients are free from haemolysis, periprosthetic leak or valve related thromboembolic events in follow-up of 1-24 months, total of 189 patient years.

Conclusion: TTK Ring does not invite excessive fibrosis avoiding formation of Pannus on valve minimizing valve related Thromboembolic or Obstructive, haemolytic Complications, has excellent haemodynamic profile, fulfilling ideal valve criteria at lesser cost.

PE8—DOES THE CORONARY ARTERY ENDARTERECTOMY INCREASE THE MORBIDITY AND MORTALITY COMPARED WITH ISOLATED CORONARY ARTERY BYPASS GRAFTING? SINGLE CENTER STUDY

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The incidence of coronary artery disease is on an increasing trend. With the advancement of non surgical method to achieve myocardial revascularization the cases coming to surgical revascularization are of complex and diffuse anatomy.

Coronary endarterectomy (CE) is the chosen technique for revascularization of diffuse and totally occluded coronary artery. The risk of perioperative events is higher in CE and long term prognosis is significantly worse than coronary artery bypass grafting (CABG) alone.

Objectives:

1. To compare the postoperative complication between CABG with EC and CABG alone.
2. To compare mortality between CABG with CE and CABG alone.

Methods and Results: It is a retrospective observational single center study during the period from January 2009 to November 2010 in which we reviewed 48 patients who underwent CABG with CE compared with 108 who underwent CABG alone. Bleeding was 7.1% in CABG with CE and 2.8% in CABG alone, 3.6% required intraortic balloon pump in CABG with CE while 0.9% in CABG alone. Patient who developed low cardiac output were 3.6% in CABG with CE and 2.8% in CABG alone.

Mortality was 3.6% in CABG with CE and 0% in CABG alone.

Conclusion: CABG with CE increases morbidity and mortality than CABG alone.

PE9—THE ALFIERI STITCH: UNUSUAL ACCESS AND UNUSUAL INDICATIONS

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Objectives: To highlight some unusual indications and an unusual access route for Alfieri stitch mitral valve repair.

Methods: Case 1: A 76-year-old female with aortic stenosis (AS), Left Ventricular Outflow Tract (LVOT) hypertrophy, mild mitral regurgitation (MR) and Coronary Artery Disease (CAD), underwent Aortic Valve Replacement (AVR), Coronary Artery Bypass Grafting and a myectomy. TEE then demonstrated previously unrecognised Systolic Anterior Motion (SAM) of the mitral valve and a LVOT gradient of 60 mmHg. A thick bar of calcium in the annulus around the posterior leaflet of the mitral valve, made suture placement impossible but an Alfieri stitch corrected the SAM and MR. Case 2: A 73-year-old lady with severe AS, peripheral oedema and believed mild MR, underwent AVR. Intraoperative TEE however demonstrated pulmonary hypertension and severe MR. The mitral annulus was completely calcified, making suture placement impossible and so an Alfieri stitch was performed. Case 3: A frail 77-year-old lady with severe AS, significant MR and CAD. Since it was felt important to minimise operative time and trauma

in this very sick patient, an Alfieri stitch repair was carried out via the aorta, after aortic valve leaflet excision.

Results: Each patient had effective treatment of their MR (and SAM). Case 2 died of unrelated complications 2 months later. The other patients are alive and well with resolution of their symptoms.

Conclusion: An Alfieri stitch may not give such a perfect repair as more complex surgery, but in difficult circumstances where there is severe calcification of the mitral annulus and suture placement is impossible, SAM, or high risk cases where prolonged bypass is unwise, this may be the only treatment option or may be more appropriate than conventional repair, particularly as it can be performed quickly via the aorta, so minimising dissection.

PE10—ACUTE RENAL INJURY AFTER OPEN HEART SURGERY

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Patients undergoing isolated coronary artery bypass grafting associated with acute renal injury is a major postoperative complication. Although some early recovery is common, its effect on long-term outcomes is unknown.

Methods: Data were examined for 100 patients undergoing isolated coronary artery bypass grafting from 2005 to 2010. Patients with acute renal injury were identified, defined as a peak postoperative creatinine level exceeding 50% above baseline. Renal recovery was characterized using postoperative creatinine values. The recovery variable with the strongest association with 1-year survival was selected and validated internally.

Results: The renal recovery variable with the strongest association with 1-year survival was the percentage decrease in creatinine 24 hours after its peak value (PD24; C index, 0.72; $P = .002$). Cox proportional hazards analysis showed a significant negative association between PD24 and long-term mortality (0.82 hazard ratio for each 10% change).

Conclusions: Early recovery of renal function is associated with improved short-term survival. This variable is clinically useful because it occurs immediately after the peak creatinine level and simultaneously helps define the severity of acute renal injury and the magnitude of recovery. Given the high risk of death associated with postoperative acute renal injury, early renal recovery seems to offer a distinct survival benefit and may represent an important therapeutic focus.

PE11—INTRAVENOUS LEIOMYOMATOSIS WITH INTRACARDIAC EXTENSION: A REPORT OF THREE CASES

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Uterine leiomyoma is a common disease in women; however, intravenous leiomyomatosis with intracaval and intracardiac complications is a rare condition. The initial presentation is dependent upon the severity of the intracardiac involvement. In this report, we describe three women with leiomyomatosis originating from the uterus and extending into the inferior vena cava to the right ventricle that was successfully resected using a two-stage approach.

PE12—APPLICATION OF BIOGLUE DURING CORONARY ARTERY BYPASS GRAFTING IN PATIENTS WITH OSTEOPOROSIS

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Objective: To study the effect of bioglue on the sternal bleeding and sternal wound infection and dehiscence after median sternotomy in patients with severe osteoporosis.

Methods: Fifty-eight patients with severe osteoporosis who underwent median sternotomy during beating-heart coronary artery bypass grafting (CABG) under extracorporeal circulation were randomly divided into bioglue group and control group. The medullary cavity of the sternum was spread with bioglue in bioglue group and bone wax in control group. The drainage volume on the first day and total drainage volume the hemoglobin content in the drainage the duration of drainage the time of suture removal the duration of continuous fever the mean duration of hospitalization, and the healing of the sternal wound were recorded.

Results: The drainage volume on the first day and total drainage volume, the hemoglobin content in the drainage the duration of drainage and the mean duration of hospitalization in bioglue group were significantly lower than those in control group (all $P < .05$). There was no significant difference in the duration of continuous fever the time of suture removal and the healing of the sternal wound between these 2 groups.

Conclusion: Bioglue can be used in patients with severe osteoporosis who undergo median sternotomy during CABG under extracorporeal circulation.

PE13—DOUBLE-VALVE PROCEDURES WITH "CARDIAMED EASY CANGE" MECHANICAL VALVE PROSTHESIS

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Objective: Authors present their primary series of double-valve procedures with the "CardiaMed" mechanical valve prostheses in new modification "Easy Change."

Material and Methods: The essence of the "Easy Change" modification is detachable cuff, with the "plug-and-socket" valve housing. Since 2009, 13 patients underwent aortic and mitral valve replacement (AVR + MVR) with this type of prostheses. There were 5 (38.5%) women. Mean age was 47.2 ± 1.2 year. Disease etiology was rheumatic in 10 (76.9%) patients, and infective endocarditis in 3 (23.1%).

In 3 cases the "CardiaMed Easy Change" implantation was performed as a redo surgery for prosthetic valve failure. The majority of patients were in NYHA Class III (38.5%) and IY (61.5%).

Concomitant procedures were tricuspid valve repair (92.3%), LA thrombectomy (30.7%), and RF ablation for atrial fibrillation (30.7%).

Results: There were no hospital mortality in the group. Postoperative course complicated with atrioventricular block and permanent pacemaker insertion in 1 patient. Postoperative echocardiography revealed the mitral prostheses effective orifice to be 2.95 ± 1.34 cm^2, mean pressure gradient 2.5 ± 2.1 mmHg for mitral, and 11.65 ± 2.32 mmHg for aortic position.

Conclusion: Double-valve procedures with "CardiaMed Easy Change" mechanical heart valve prostheses are safe and ensure adequate hemodynamic. In case of mechanic valve failure, dismountable valve housing of "CardiaMed Easy Change" secures easy valve re-replacement. Although more follow-up is necessary for its safety and efficiency assessment.

PE14—STRENGTH AND FLEXIBILITY MEASUREMENT IN PATIENTS IN PHASE II CARDIOVASCULAR REHABILITATION

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Purpose: To measure the muscular strength and flexibility of the lower limb muscle group in patients undergoing cardiovascular surgery before and after joining Phase II Cardiovascular Rehabilitation Programs.

Materials and Methods: Three hundred ninety-seven patients undergoing cardiovascular surgery were prospectively assessed after completing a supervised 5-session protocol including exercises for the lower limbs. Also, strength and flexibility were measured at the beginning and at the end of the program. In order to evaluate strength, the Epley test was used (maximum number of repetitions with a pre-established load). The "sit and reach test" for trunk and hamstring flexibility was used. The paired t test was used to analyze the data. The data is expressed as a mean value ± standard error of the mean value (SE).

Results: Patients' age 62.41 ± 1; 79.09% were males. As regards risk factors, 73.04% of the patients had a history of hypertension; 20.65%, diabetes, 58.32% dislipemia, 35.01% cigarette smoking; 23.67% were obese, and 59.19% had no risk factors.

Results

Variable	Pre-training	Pst-Training	*P* value
Strength	20.3 ± SE 0.4	24.2 ± SE 0.5	< .001
Flexibility	9 ± SE 0.6	14.1 ± SE 0.5	< .001

Conclusions: Strength and flexibility exercises for the lower limbs in Phase II Cardiovascular Rehabilitation Programs improve fitness for aerobic training and self-sufficiency in activities of daily living in patients undergoing cardiovascular surgery.

PE15—A NEW TECHNIQUE FOR MITRAL REPAIR

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Objectives: As mitral annulus can shorten its circumference 10%, even flexible rings can't do this and damage leaflet coaptation. Open mitral commisurotomy can't replace clear zone. Function of clear zone is by the help of intraventricular pressure to get the leaflets to approach each other. This new repair technique lets us decide where the leaflets' free edges will be at sistole and provides proper leaflet coaptation physiology.

Methods: In this technique, firstly a 5-0 pledgeted Ticron® suture is passed with over and over technique on posterior leaflet just 3 mm medially to the commissure and 3 mm away from the posterior annulus. After tying this, suture is not cut and the needles are passed from the anterior leaflet with over and over technique. Our point on anterior leaflet is 3 mm medially from the commissure and the point that moves like a hinge as anterior leaflet opens (close to clear zone).Than the suture is tied again pulling leaflets to make them approach each other and getting one on the other at a distance of 3 mm. We repeat the same process on the other commissure of the leaflets.

Results: In year 2005, we used this technique for a 52-year-old patient who had a closed mitral commissurotomy 15 years before and had a valve area of 0.9 cm^2. After our operation he had a valve area of 3 cm^2. We follow him with minimally mitral regurgitation.

Conclusion: Annuloplasty techniques are not directly concerned with leaflet coaptation. Altered left ventricular geometry and place of papillary muscles create big problems in long term. In this technique, sutures which pass from leaflets are tied and they don't make a gliding effect. Newly formed clear zones block regurgitation by Venturi Effect. If necessary, papillary muscles can be attached to clear zones by artificial chordae.

PE16—EFFECTIVENESS OF POSTERIOR PERICARDIOTOMY IN DECREASING CARDIAC TAMPONADE DURING THE HEART SURGERY POSTOPERATIVE PERIOD

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Background: Cardiac tamponade is an infrequent complication during the heart surgery postoperative period, but it may result in irreversible neurological complications. Posterior pericardiotomy is a simple procedure which could decrease the risk of cardiac tamponade.

Objectives: To demonstrate that posterior pericardiotomy is a safe procedure which decreases the risk of cardiac tamponade.

Methods: Clinical trial in patients who underwent cardiovascular surgery. The study group (cases) included patients who underwent a pericardiotomy and the control group included those patients with previous surgeries who were not submitted to such a surgical procedure.

Results: Out of the 1346 patients analyzed, 265 (19.7%) were in the study group and 1081 (80.3%) were in the control group. In the study group, 128 (48.3%) patients underwent a coronary bypass procedure, 8 (3%) patients underwent

a coronary bypass procedure + a different surgery, 22 (8.3%) patients underwent a coronary bypass procedures + valve, 7 (2.6%) patients underwent a coronary bypass procedure + valve + a different surgery, 74 (27.9%) patients underwent a valve surgery, 29 (10.9%) patients underwent a valve surgery + a different procedure.In the control group, 631 (58.3%) patients underwent a coronary bypass procedure, 47 (4.3%) patients underwent a coronary bypass procedure + a different surgery, 82 (7.5%) patients underwent a coronary bypass procedure + valve surgery, 31(2.8%) patients underwent a coronary bypass procedure + valve surgery + a different procedure, 239 (22%) patients underwent a valve surgery, and 99 (9.1%) patients underwent a valve surgery + a different procedure.

In the study group, 1.1% of patients showed a cardiac tamponade, while 4.8% of patients in the control group showed a statistically significative difference ($P = .014$).

Conclusions: Posterior pericardiotomy is a simple and safe procedure by means of which a risk of cardiac tamponade can be decrease.

PE17—MORTALITY RELATED RISK FACTORS FOR MITRAL VALVE RECONSTRUCTION

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Background: Mitral valve reconstruction (MVR) with modified Paneth technique for severe regurgitation is a therapeutic option. We stratified the risk for mortality of patients requiring MVR.

Methods: Between 2006 and 2008, 104 patients (31 women, 73 men, age 52 ± 24 years) underwent MVR at our institute. Of these, 60 were operated on with solitaire MVR (SOLITAIRE), and 44 with MVR combined with CABG (COMBI) due to the ischemic origin of their mitral regurgitation. We evaluated their perioperative period.

Results: No perioperative death occurred. During the first postoperative year 15 (14%) patients died. Of these, 10 (23%) and 5 (8%) died after SOLITAIRE and COMBI, respectively. Regression analysis based on 300 clinical and para-clinical parameters showed the risk factors for mortality listed in the table.

Comment: The comorbidity of diagnoses before the operation listed in the table lead to an increased risk for mortality after mitral valve reconstruction.

Pre-OP condition	Odds ratio	95 % CI
Hypokinesia	6.5	1.7-25.0
Immunosuppression	4.4	0.7-30.0
Chronic obstructive pulmonary disease	4.2	0.9-20.0
Coronary artery disease	3.2	1.0-10.3
Cortison medication	3.1	0.3-36.6
Diabetes mellitus insulin treated	2.9	0.8-10.8
Pericardial effusion	2.9	0.2-34.0
Beta blocker	2.2	0.5-8.6
Diabetes mellitus non-insulin treated	1.0	0.1-8.8

PE18—MITRAL VALVE RECONSTRUCTION WITH MODIFIED PANETH TECHNIQUE COMBINED WITH CORONARY ARTERY BYPASS GRAFTING FOR ISCHEMIC MITRAL VALVE REGURGITATION AND CORONARY ARTERY DISEASE

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Background: Ischemic mitral valve regurgitation (IMVR) due to ischemic heart disease (IHD) requiring coronary revascularization is a therapeutic challenge. We analyzed the outcome of patients operated on by a single surgeon performing mitral valve reconstruction using a modified Paneth technique combined with coronary artery bypass grafting (MVPT-CABG) for IMVR and coronary artery disease (CAD).

Methods: In 2008, 60 patients (25 women, 35 men, age 44 ± 27 years) underwent MVPT-CABG for IMVR due to IHD at our institute. We evaluated their perioperative period.

Results: No perioperative death occurred. After 2 weeks (POD 14) all patients were discharged from the intensive care unit after follow-up of cardiac performance (table: parameters mean ± SD pre-OP versus POD 14).

	Pre-OP (mean ± SD)	POD 14 (mean ± SD)
MVR grade *	3 ± 0	0.4 ± 0.4
CAD / CABG *	2.3 ± 0.5 / 0 ± 0	2.3 ± 0.5 / 2.3 ± 0.4
LVEF * (%)	31 ± 12	43 ± 12
LVEDD * (mm)	65 ± 9	57 ± 9
LVESD * (mm)	53 ± 12	45 ± 13
LA * (mm)	45 ± 8	40 ± 5
LV wall thickness syst * (mm)	11 ± 3	15 ± 3
LV wall thickness diast * (mm)	8 ± 2	10 ± 2
RVEF * (%)	46 ± 10	54 ± 4

*Significance in Student's t-test for paired data

Comment: Elderly patients suffering from IMVR grade 3 and CAD due to IHD can be successfully treated by the MVR-CABG operation.

PE19-POST-OPERATIVE REFRACTORY SHOCK AFTER CARDIAC SURGERY: UNDERLYING HEMODYNAMIC PATTERNS

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Objective: Postoperative refractory shock (RS) after cardiac surgery is associated with high morbimortality rate. The objective is to analyze the hemodynamic patterns (HP) prevalence, predisposing factors and morbimortality.

Methods: Retrospective study, including 690 cardiac surgery between Jan. 2009 and Jan. 2010; 67 patients (p) (9.7%) evidenced RS (noradrenaline > 0.5 µg/kg/min) within 72 hours postoperative. Vasoplegic shock (VS): mean blood pressure (BP) < 50 mmHg, right atrium (RA) < 5 mmHg, wedge (W) < 10 mmHg; cardiac index (CI) > 2.5 :L/min/m², systemic vascular resistance (SVR) < 800 dyne/sec/cm. Cardiogenic Shock (CS): systolic BP < 80 mmHg; RA > 15 mmHg, W > 18 mmHg, CI < 2.2 L/min/m²; SVR > 800 dyne/sec/cm. Mixed Shock (MS): parameters of both definitions.

Results: No differences were observed in the general characteristics except for left ventricular systolic dysfunction (LVSD): 9 p with CS (75%); 15 p with MS (34%); 1 p with VS (9%) (P = .02). Cardiopulmonary bypass (CPB) was, in VS group 181 min, in MS 164 min and in CS 161 min (P = .32). An exponential relationship was found between VS and CPB after 160 min. Ten p (91%) with VS were polytransfused, 36 p (82%) with MS and 5 p (42%) with CS (P = .007). A high postoperative complications rate was observed. In-hospital mortality was 46% (CS 75 %, MS 41%, VS 37%, p= 0.08), with a RR in CS raw data: 1.87 (C.I. 95% 1.18, 2.96) and adjusted RR (ARF, age, CPB): 5.8 (C.I. 95% 1.2, 27.7).

Conclusions: Postoperative RS after cardiac surgery is associated with high morbimortality rate. In our series, MS was the predominant HP. LVSD was predictive of CS as was polytransfusion of VS. A stepwise association was observed between CPB and VS. There was a trend towards a higher lactic acidosis and in-hospital mortality in the CS group.

PE20—REDO CARDIAC SURGERY FOR VALVULAR HEART DISEASE IN PATIENTS WITH LOW EJECTION FRACTION OF LEFT VENTRICLE

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Objective: Assess the immediate results of heart valves operations as redo cardiac surgery in patients with systolic left ventricle dysfunction.

Methods: Science 2000 till 2010 were operated 46 patients with low ejection fraction of left ventricle (≤50%). There were 22 (47.8%) men in the age from 20 to 66 years (mean 48.9 ± 9.8 year). All patients underwent redo cardiac surgery for valvular heart disease. There was no coronary artery disease.

Lesions were of rheumatic origin in 63.1%, prosthesis dysfunction 21.7%, infective endocarditis 4.3%, degenerative 2.2%, and traumatic 2.2%. Previous cardiac surgeries included mitral commissurotomy (52.3%), valve replacement (37%), and various cardiac procedures in 10.7% of cases (aortic valvuloplasty, aortic commissurotomy, ventricle septum defect closure, etc.). There was history of multiple thoracic reentry in 17.4%. In 1 case (2.2%) surgical access complicated with right ventricle rupture, successfully overcome. Before operation 2.2 % of patients had II, 63.1% III and 30,4% IV class NYHA.

Results: Hospital mortality was 6.5% (acute heart failure in 2 patients, and intraoperative hemorrhage in 1 case). Early complications were heart failure (14%), multiorgan failure (9.3%), surgical site infection (9.3%), renal failure (7%), stroke (4.7%), pleural hemorrhage (4.7%) and gastrorrhagia (2.3%). There was improvement of left ventricle ejection fraction in all survivors (55 ± 5% comparing with 43 ± 7% preoperatively).

Conclusions: Redo cardiac surgery for valvular heart disease in patients with systolic left ventricle dysfunction is characterized with satisfactory early results, left ventricle ejection fraction improvement, and low complication rate.

PE21—CORONARY-PULMONARY STEAL SYNDROME CAUSED BY INTERNAL MAMMARY ARTERY TO PULMONARY ARTERY FISTULA FOLLOWING CORONARY BYPASS SURGERY

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Background: Here, we present fistulas involving the internal mammary artery graft are rare but well-known complications of coronary artery bypass surgery. We discussed management of this disease.

Methods: A 61-year-old man developed recurrent angina 5 years after coronary bypass surgery. Coronary angiography showed a fistula between pulmonary artery and internal mammarian artery. Surgical closure of the fistula was performed by using stappler suturing device via anterolateral thoracotomy.

Results: Angina disappeared after treating coronary steal syndrome. He has remained asymptomatic for 14 months.

Conclusions: Internal mammary artery fistulas should be considered as a possible cause of recurrent angina after bypass surgery. Coronary angiography with selective injection of the left internal mammary artery should be performed to diagnose this condition. Surgical treatment can be recommended who can tolerate surgical intervention to prevent complications of a fistula, such as heart failure, infective endocarditis aneurysmal expansion. Percutaneous intervention can be performed, although it might be associated with the risk of distal coronary or/ and pulmonary artery embolization.

PE22—MITRAL VALVE REPLACEMENT IN PATIENTS WITH LOW EJECTION FRACTION OF LEFT VENTRICLE

Shmatov, D.,[1] Zhelesnev, S.,[2] Astapov, D.,[2] Karaskov, A.,[2] Balakhonov, V.,[1] Buyankov, D.,[1] Verkhoturov, M.,[1] Gorbunov, D.,[1] Muradov, A.[1]

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Objective: To investigate possibility for performance of operation mitral valve replacement in patients with left ventricle systolic dysfunction.

Methods: From 2000 till 2010 there were investigated 39 patients (I group) with low ejection fraction (≤50%) of left ventricle for mitral stenosis. No one of patients had any coronary artery

disease. All of them underwent to operation mitral valve replacement. The control group (II group) consisted of 49 patients with normal ejection fraction by which mitral valve replacement was executed for mitral stenosis. The mean ejection fraction in I group was 47%, in II group it was 62%.

Results: The level of hospital heart failure was higher in I group then in II group (24.3 % and 8.3 % accordingly, $P = .04$). Hospital mortality in I group was 2.6 % (1 patient, died of multiorgan failure), in II group 2.0% (1 patient, died of left ventricle posterior wall rupture).

Our experience of mitral stenosis surgery in patients with low ejection fraction of left ventricle showed that, in spite higher level of heart failure in the early postoperative period, there were no significant difference in hospital mortality and postoperative heart remodeling in patients of research group in comparison with control group.

Conclusions: Systolic dysfunction of left ventricle is no contraindication for mitral valve replacement in patients with mitral stenosis.

PE23—EFFECT OF PREOPERATIVE LOW EJECTION FRACTION ON POSTOPERATIVE MORBIDITY, MORTALITY AND SURVIVAL IN THE PATIENTS UNDERGOING OFF-PUMP CABG SURGERY

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Objective: Off-pump coronary artery bypass grafting (CABG) is an alternative therapeutic approach for patients with coronary artery disease with low ejection fraction (EF). The aim of this study is to investigate the effect of preoperative low ejection fraction on postoperative morbidity, mortality and survival in the patients undergoing off-pump CABG.

Methods: Between January 2002 and December 2009, 377 patients underwent off-pump coronary artery bypass grafting (CABG) in our clinic. Patients were divided into 2 groups:

Group I (EF < 30%) and

Group II (EF ≥ 30%).

Non-categorical data were evaluated with t-test and categorical data were evaluated with Chi-Square and Fisher's exact test.

Results: Preoperative low ejection fraction (< 30%) was seen in 15.1% (57 patients). Postoperative mortality rate was 0.5% (2 patients) and these patients had low EF. Male gender, smoking, peripheral arterial disease, prolonged inotropic support, use of intraaortic balloon pump (IABP), postoperative atrial fibrillation (AF) were more common in Group I ($P < .05$). Length of ICU and hospital stay were longer in Group I ($P < .05$). Urgent or emergent operation, prolonged inotropic support, postoperative AF, reoperation for bleeding, massive blood transfusion (>3 units) were factors prolonging length of ICU stay in Group I ($P < .05$). Urgent or emergent operation was factor prolonging length of hospital stay in Group I ($P < .05$). Need for hemodialysis was factor affecting postoperative mortality in Group I ($P < .05$). Advanced age was factor affecting survival in Group I ($P < .05$).

Conclusions: Off-pump CABG could be performed on patients with low ejection fraction with low mortality and morbidity rates.

PE24—RISK FACTORS AFFECTING MORTALITY, MORBIDITY AND SURVIVAL AMONG PATIENTS WITH HYPERLIPIDEMIA UNDERGOING OFF-PUMP CABG

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Objective: Hyperlipidemia is an important risk factor of the development of coronary artery disease. In this study, we aimed to investigate the effect of hyperlipidemia on mortality, morbidity and survival among patients with hyperlipidemia undergoing off-pump coronary artery bypass grafting.

Methods: Between January 2002 and December 2009, 377 patients underwent off-pump coronary artery bypass grafting (CABG) in our clinic. These patients were divided into Group I (with hyperlipidemia) and Group II (without hyperlipidemia). Hyperlipidemia was seen in 39.8% (150 patients). Non-categorical data were evaluated with t-test and categorical data were evaluated with Chi-Square and Fisher's exact test.

Results: Hypertension, calcification of ascending aorta, prolonged inotropic support were factors affecting survival in Group I ($P < .05$). Low ejection fraction (< 30%, ≥30-50%), prolonged inotropic support, postoperative atrial fibrillation (AF) were factors affecting length of ICU stay in Group I ($P < .05$). Low ejection fraction (< 30%, ≥30-50%), prolonged inotropic support, reoperation for bleeding were factors affecting length of hospital stay in Group I ($P < .05$). Previous stroke, low ejection fraction, prolonged inotropic support, prolonged ventilatory support, postoperative renal insufficiency, need for hemodialysis, postoperative AF were factors affecting postoperative mortality in Group I ($P < .05$). Chronic obstructive pulmonary disease, low ejection fraction, prolonged inotropic support, postoperative AF AF were factors affecting mortality in follow-up in Group I ($P < .05$).

Conclusions: Pre-and postoperative risk factors in Group I have important role on morbidity, mortality and survival.

PE25—LONG-TERM RESULTS OF "CARDIAMED-2" MECHANICAL VALVE IMPLANTATION: 7 YEAR FOLLOW-UP

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Purpose assessment of the long-term results of heart valves CARDIAMED replacement.

Material and Methods: 420 patients operated on in 2003-2004 in 7 heart surgery institutions (isolated mitral [MVR] or aortic [AVR] valve replacement), and returned for the follow-up in 2006-2011 were included. MVR 209 patients, AVR 211 patients;

mean age 52.2 ± 10.2 years (range 12-78); 47.4% females. Completeness of the study was 99.05%, maximum term of observation 7.5 years, and observation volume was 2188.5 patient-years, Including 1081.6 patient-years for patients with AVR and 1106.9 patient-years for patients with MVR.

Results: Overall survival after 7 years was 85.1% ± 3.7%. Overall survival after 7 years without mortality in 30-day period was 88.3% ± 3.4%. Survival in patients with AVR after 7 years was 86.1% ± 4.8%, with the MVR 84.4% ± 5.4%. Survival in patients with AVR after 6 years without mortality in 30-day period was 89.1% ± 4.4%, but with the MVR 87.7% ± 5.1%.

Freedom from valve-dependent mortality after 7 years was 94.3% ± 2.5%. Freedom from valve-dependent mortality after 7 years without mortality in 30-day period from the compositions of 94.3% ± 2.5 freedom from valve-dependent mortality after 7 years with AVR was 93.9% ± 3.7% at MVR 94.5% ± 3.2%. Free survival, valve-dependent complications after 7 years at AVR without mortality in 30-day period was 94.8% ± 3.1%, for MVR 93.8% ± 3.82%.

The linearized rate of valve-dependent complications were as follows: structural failures of the prosthesis, 0%; thrombosis of 0.63% per patient-years (including 0% for AVR and 0.63% for MVR), thromboembolic complications, including transient neurologic deficit (2, 13% for AVR and 2.98% for MVR), hemorrhagic bleed 0.64% per patient-years, prosthetic endocarditis 0,28%, hemolysis 0%.

Conclusion: "CardiaMed-2" mechanical heart valve prostheses meet the contemporary world standards.

PE26—TO THE QUESTION OF THE NATURAL COURSE OF ANEURYSMS OF THE ASCENDING AORTA

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Objective: To present the analysis of the natural course of aneurysms of the ascending aorta (AAA).

Patients population: 118 patients with AAA and aortic valve incompetence (AI) were not operated upon because of different reasons. They were under observation from 1980 until 01 Jan. 2011. The patients age ranged from 17 to 69 years with a mean 48.6 ± 6.4 years. There were 91 (77.2%) males and 27 (22.9%) females. The causes of AAA development were: arterial hypertension and atherosclerosis in 60 (51.8%), Marfan syndrome in 25 (21.9%), cystic medianecrosis in 11 (9.6%), bicuspid aortic valve in 9 (5.3%), syphilis in 6 (5.3%) and uncertain etiology in 7 (6.1%) pts. 110 (93.2%) patients were in functional class IV NYHA classification and 8 (6.8%) patients were in functional class III.

Results: 110 (93.2%) patients died in terms up to 3 years since the disease was diagnosed and 95 (86.4%) patients of them died because of aneurysms rupture. The remaining 6 (5.3%) patients died during the 4th year, and only 2 (1.8%) survived 5 years period.

Conclusion: Life prognosis for patients with AAA and AI is unfavorable. Operative treatment for them is absolutely necessary.

PE27—EVALUATION OF SCORES USED TO PREDICT RIGHT VENTRICULAR FAILURE AFTER LVAD IMPLANTATION

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Background: Different scores were calculated for the prediction of right ventricular failure after LVAD implantation. We evaluated the available scores based on our patient population.

Methods: Between Jan. 2008 and Oct. 2010 190 LVADs (79 HeartMate II, 1 VentrAssist, 4 Jarvik 2000, 65 HeartWare, 31 Incor, 2 DeBakey, 6 Duraheart, and 2 Berlin Heart Excor) were implanted at our institution. The decision for LVAD implantation was based on our institutional criteria. The Fitzpatrick and the Matthews scores were retrospectively evaluated. The prediction of whether the patient would have favorable outcome after LVAD implantation was assessed by using the area under the receiver operating characteristic (ROC) curve for each score.

Results: Thirty-seven of the 190 LVAD patients developed right heart failure after LVAD implantation (19%). The area under the ROC curves for the Fitzpatrick and the Matthews score was 0.663 (95% CI 0.558-0.768) and 0.641 (95% CI 0.536-0.741), respectively.

Conclusions: Neither score is very accurate in the prediction of RV failure after LVAD implantation. New scores should therefore be developed for continuous flow LVADs.

PE28—POST-CARDIAC SURGERY DELIRIUM RISK FACTORS AND CLINICAL OUTCOME

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Post-cardiac surgery delirium is a common complication associated with prolonged stay in the intensive care unit and the hospital. Our aim was to identify the predictors and to evaluate the effects of the postoperative delirium on clinical outcomes.

Analyzing the data of 2160 patients after cardiac surgery on cardiopulmonary bypass (CPB) by method of elimination, we have selected 90 patients, who developed postoperative delirium according the Intensive Care Delirium Screening Checklist (ICDSC), the Richmond Agitation-Sedation Scale (RASS) and The Confusion Assessment Method for the Intensive Care Unit (CAM-ICU) criteria, and the patients were divided in two groups by evaluating the severity of the delirium: light and moderate delirium group (n = 74) and severe delirium group (n = 16). The data are presented as the mean and the standard deviation (M(SD). Statistical significance was accepted at a level of $P < .05$.

The rate of early post-cardiac surgery delirium was low (4.17%). We've determined that post-cardiac surgery delirium prolonged the length of stay in the ICU (8.4 (8.6)) and hospital stay (23.6 (13.0)) days. The patients had higher preoperative risk score, their age was 71.5 (8.9) years, the body mass index was 28.8 (4.4) (kg/min^2), the majority were male (72.2%), ejection fraction was 46.1 (11.9)%. The statistical analysis by multivariable logistic regression

has indicated that increasing the dose of fentanyl administered during surgery over 1.4 mg was also increasing the possibility of developing a severe delirium (OR = 9.9, CI 1.5-65.1) and longer aortic clamping time could be independently associated with severe postoperative delirium (OR = 1.02, CI 1.0-1.05).

Our data suggest that early post-cardiac surgery delirium couldn't be common complication, but it significantly prolonged the length in stay at the ICU and hospital stay. The delirium risk factors such as longer aortic clamping time and the dose of fentanyl could be modified and could rapidly indicate a postoperative delirium.

PE29—SURGICAL TREATMENT OF VENTRICULAR TACHYCARDIA IN POSTINFARCTION LEFT VENTRICULAR ANEURYSM

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Objective: The surgical ventricular restoration in patients with coronary artery disease and postinfarction left ventricular aneurysm can be extended to treat ventricular tachycardia. The aim of this study was to evaluate the left ventricular aneurysmectomy, with endocardial resection of the scar, to treat ventricular tachycardia in patients with postinfarction left ventricular aneurysm in our institution.

Methods: From 2004 to 2009, 23 patients (9 women, 14 men) with ventricular tachycardia and left ventricular aneurysm underwent surgical ventricular restoration with complete or partial resection of the scar. Retrospective analysis of medical files and preoperative and postoperative echocardiographic results was done. Arrhythmia control was evaluated by analysis of events registered by implanted defibrillators and by review of patient's records.

Results: Mean postoperative follow-up was 182.69 days (Range 7-215 days). Mean age was 67.77 ± 10.80 (43-83). All aneurysms were anterior. All patients underwent concomitant coronary artery bypass grafting. Surgical success rate in patients with preoperative spontaneous ventricular tachycardia was 62.5%. Inducible ventricular tachycardia was found in 3 patients of 12 who underwent postoperative programmed stimulation. The ejection fraction increased from 24.22% ± 6.22% to 42.11% ± 7.14% ($P < .05$). The New York Heart Association class was improved from 2.67 to 1.82 ($P < .05$). Hospital mortality was 4.34%. Six months survival was 91.30%, one year survival was 86.95%, and two years survival was 82.60%.

Conclusion: The surgical ventricular restoration with endocardial resection of the scar is an effective treatment for postinfarction left ventricular aneurysm with ventricular tachycardia. Reduce the need for an implantable defibrillator in most patients. The increased of the ejection fraction and the improvement of the New York Heart Association class are statistical significant ($P < .05$). The surgical treatment achieved satisfactory result regarding early mortality and survival.

PE30—SURGICAL TREATMENT OF POSTINFARCTION LEFT VENTRICULAR ANEURYSM IN PATIENTS WITH LEFT VENTRICULAR EJECTION FRACTION OF 35% OR LESS

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Objective: The surgical ventricular restoration in patients with coronary artery disease and postinfarction left ventricular aneurysm still a point of debate. The aim of this study is to compare the results of two specific surgical techniques (linear versus circular) in patients with severely depressed pump function.

Methods: Between 2000 and 2008, 84 patients (25 women and 59 men) with severe left ventricle dysfunction, were operated on for post-infarction left ventricular aneurysm. 28 patients underwent linear repair (group A) and 56 circular patch repair (group B). Pre and postoperative left ventricular ejection fraction (EF) and early and long term mortality were studied. A multivariate regression analysis was done to determine variables associated to EF changes.

Results: Mean postoperative follow-up was 90 ± 42 months (Range 1-145 months). Mean age was 64.82 ± 9.81 (40-83). All aneurysms were anterior. The EF increased from 23.84% ± 7.91% to 36.93% ± 7.58% in group A and from 22.19% ± 7.29% to 37.43% ± 9.65% in group B. All patients underwent concomitant coronary artery bypass grafting (CABG); 7 patients of group A (19.83%) and 11 of group B (15.36%) suffered of low cardiac output syndrome. Adjusting for age, gender, surgical technique und New York Heart Association class in a multivariate logistic regression model, was observed that independent variables in the prediction of EF increase were gender (male, $P < .05$) and surgical technique. Hospital mortality in group A was 8.48%, in group B was 7.66%. The 30 days, 60 months, and 120 months survival was 91.60%, 79.10%, and 63.60% in group A and 92.50%, 82.20%, and 69.50% in group B. Predictors for long term mortality were preoperative EF, age and congestive heart failure.

Conclusion: Increased of EF was higher after circular patch repair with concomitant CABG of postinfarction left ventricular anterior aneurysm in patients with EF ≤ 35. Important predictors of early survival were preoperative EF und gender.

PE31—SURGICAL TREATMENT FOR AORTIC ROOT ABSCESS IN PATIENTS WITH ACTIVE INFECTIVE ENDOCARDITIS

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Aortic root abscess has been one of the most challenging surgical treatments in active infective endocarditis (IE), which needs complete resection of infective tissue following proper reconstruction of outflow of the left ventricle.

From June of 2004 to February of 2011, we experienced 8 cases (32%) with root abscess cases in 25 active IE in the aortic valve positions. Indications of emergency were uncontrollable heart failure in one case, uncontrollable infection and/or recurrent distal embolization under antibiotics in the other seven cases. Organisms were revealed in 6 cases (alpha-streptococcus in 3, staphylococcus in 2, MRSA in 1).

Surgical procedures were verified depending upon progression of infection. AVR with reconstruction of aortic root with autologous or xenogeneic pericardium were performed in 6 cases. Monobloc AVR + MVR was required in one case. AVR and MVP with reconstruction of aorto-mitral continuity was performed in one case. One case with preoperative multiple embolization of MRSA IE was died from acute heart failure due to mediastinitis about one month after operation. One case with deep infection of ventricular septum was developed LV-RV fistula, which was repaired with modified Konno method in 2 months after the operation under stable condition without infection. The other patients including redo modified Konno case were all stable without any sign of infection with good prosthetic function.

Aortic root abscess with active IE would require unhesitating surgical procedure with aggressive and complete resection of infective tissue for rescue from catastrophic situations.

PE32—RECURRENT EFFUSIONS RELATED TO POST-PERICARDIOTOMY INFLAMMATORY SYNDROME: PERICARDIO-PERITONEAL WINDOW AS AN ALTERNATIVE TREATMENT

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Objectives: The aim of this case report is to describe an alternative treatment for recurrent pericardial effusion related to post-pericardiotomy syndrome.

Methods: A 65-year-old female patient underwent on-pump coronary artery bypass grafting. Left internal mammary artery to left anterior decedent and saphenous grafts to right coronary and obtuse marginal were performed. The patient was discharged after eight days. Twenty days later, the patient had progressive short of breath and an echocardiogram revealed a severe pericardial effusion. A surgical pericardial drainage was then performed. After three days, the tube was removed. The patient was discharged and prescribed prednisolone 40 mg daily. Pathology and immunology study of pericardial biopsy showed unspecific inflammatory findings and was negative for mycobacteria, herpes, and cytomegalovirus. After 3 months, she had new onset of dyspnea and severe pericardial effusion was again diagnosed. She underwent another pericardial drainage. At this time, the daily chest tube output was high, about 500 mL/day during first week. Restricted fluid intake, steroids and diuretics were used, although only after 10 days the tube could be removed. After 2 months, she had her third episode of pericardial effusion.

Results: After sedation and local anesthesia, a sub-xiphoid incision of about 5 cm was made. The pericardial space was accessed and approximately 800 mL of liquid was aspirated. An opening of 4 cm was made in the peritoneum just inferior to another similar opening in the diaphragmatic pericardium. A running suture with 2-0 catgut was performed joining pericardium and peritoneum to create a window between both cavities. No tube was inserted. After 5 months of follow-up, patient remained asymptomatic and a control echocardiogram showed no pericardium effusion.

Conclusion: Pericardial effusions with cardiac tamponade are often resolved by drainage. Pericardio-peritoneal window is a valuable alternative for definitive treatment of recurrent pericardial effusions.

PE33—EFFECT OF MINIMALLY INVASIVE SURGERY ON THE INCIDENCE OF POSTOPERATIVE ATRIAL FIBRILLATION IN PATIENTS UNDERGOING ISOLATED AORTIC VALVE REPLACEMENT

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Objectives: Postoperative atrial fibrillation (POAF) is a common complication after cardiac surgery, associated with an increased risk of adverse outcomes, prolonged hospital stay and higher costs. The aim of this study was to evaluate whether minimally invasive aortic valve replacement (MIAVR) reduces the incidence of POAF after surgery.

Methods: Of 637 patients undergoing isolated aortic valve replacement from January 2004 to July 2010, 288 (45.2%) underwent MIAVR (MIAVR group) either through right minithoracotomy (192 patients, 66.7%) or through upper ministernotomy (96 patients, 33.3%). The remaining 349 patients (54%) underwent conventional full sternotomy and served as control group. To reduce the effect of selection bias and potential confounding, a propensity score was undertaken and forced into the multivariable analysis to evaluate independent risk factors for POAF.

Results: Overall in-hospital mortality was 1.7 % (11 patients) with no difference between the two groups. POAF was significantly lower in the MIAVR compared with control group (26.4%versus 37.5% respectively; $P = .004$). Among subjects of MIAVR group, the incidence of POAF was 23% in patients who had a right minithoracotomy and 33% in patients who received an upper ministernotomy approach, ($P = .09$). Multivariable analysis adjusted for propensity score and preoperative baseline characteristics showed that MIAVR through right minithoracotomy conferred a 46% reduction in risk of POAF (OR 0.54, 95% CI 0.35 to 0.83, $P = .09$), whereas age (OR 1.07, 95% CI 1.04-1.09, $P < .0001$) and previous history of atrial fibrillation (OR 2.34, 95% CI 1.5-3.7, $P < .0001$) were associated with increased risk. Upper ministernotomy approach did not confer any protection against POAF (OR 1.07, 95%CI 0.63-1.8, $P = .7$)

Conclusions: Minimally invasive aortic valve surgery through right minithoracotomy reduces the incidence of postoperative atrial fibrillation after aortic valve replacement.

PE34—INTRAOPERATIVE AUTOLOGOUS BLOOD PREDONATION IN VALVULAR HEART OPERATIONS WITH DIFFICULTY IN PREOPERATIVE PREDONATION

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For prevention of blood injury possibly due to cardiopulmonary bypass (CPB), intraoperative autologous blood predonation

is reported to be useful especially in on-pump coronary artery bypass grafting (CABG). In addition, intraoperative predonation may be useful also in more invasive cardiac operations. We analyzed the major factors of homologous blood transfusion in 25 consecutive cases with intraoperative autologous blood predonation, excluding cases with preoperative autologous blood donation out of 300 heart valve operations. Homologous blood was transfused in 7 cases only after CPB. The homologous transfusion was not correlated with body weight, CPB dilution or preoperative hematocrit level, but was found to correlate with age (P = .0413), CPB duration (P = .0874), bleeding output (P = .0485) and, inversely, predonation blood volume (P = .0152). In conclusion, more intraoperative predonation may reduce the necessity for homologous blood transfusion in valvular heart operations.

PE35—OFF-PUMP VERSUS ON-PUMP CABG IN OCTOGENARIANS: COMPARISON OF SHORT-TERM OUTCOMES AND LONG-TERM SURVIVAL

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Introduction: Off-pump coronary artery bypass (OPCAB) surgery has gained acceptance over the last decade and may be beneficial for high-risk elderly patients. We report a single surgeon's experience of improved perioperative outcomes in octogenarians with an OPCAB program.

Methods: We performed a retrospective intention to treat analysis of 97 consecutive octogenarians who underwent coronary bypass by a single surgeon between 1997 and 2001 before (pre-OPCAB, n = 32, initial 2 years) and after (OPCAB group, n = 65, subsequent 2 years) the initiation of a multi-vessel OPCAB program. OPCAB was attempted in all octogenarians in the OPCAB cohort.

Results: The OPCAB cohort had higher serum creatinines (1.30 ± 0.79 mg/dL versus 1.08 ± 0.27, P = .04, OPCAB versus pre-OPCAB, respectively), and ejection fractions (52 ± 14% versus 45 ± 11%, P = .02). The OPCAB group was more likely to require urgent or emergency surgery (63% versus 40%, P = .04), and to have chronic renal insufficiency (18% versus 3%, P = .05). OPCAB was tolerated by 65% of patients. After the programmatic change to OPCAB, there were significant postoperative improvements in length of hospital stay (17 ± 19 versus 8 ± 4 days, P < .01), duration of inotropic requirement (47 ± 70 versus 18 ± 39 hours, P < .04), duration of ventilator support (51 ± 54 versus 16 ± 27 hours, P < .01), and incidence of tracheostomy (16% versus 3%, P < .02). In-hospital mortalities (3.2% versus 2.7%), strokes (3 in each group), and 5-year survival were statistically similar between the two groups (85% versus 78%). The average survival was 6.5 years for all patients.

Conclusion: Despite some higher preoperative risks, the OPCAB program demonstrated clinical benefits in octogenarians but no advantage in peri-operative mortality rate or long term survival.

PE36—ASCENDING AORTA WITH OR WITHOUT AORTIC VALVE REPLACEMENT FOR AORTIC ROOT ANEURYSM

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Introduction: The ascending aortic or aortic root aneurysm in combination with aortic valve disease requires ascending aorta replacement with or without aortic valve replacement. The purpose of this report is to retrospectively review our early results of ascending aorta replacement with or without aortic valve replacement for aortic root aneurysms.

Patients and methods: From June 2009 to May 2010, 10 patients including 6 males and 4 females with aortic root aneurysms underwent ascending aorta replacement with or without aortic valve replacement and both coronaries reimplantation onto the composite valved graft. Nine patients had associated aortic valve regurgitation necessitating aortic valve replacement. In 1 patient the aneurysm was calcified, arising from non-coronary sinus of valsalva and was filled with thrombus. As the native aortic valve was competent in this patient so it was preserved.

Results: There were no intra-operative mortality, and one patient was re-explored for postoperative bleed from needle holes in proximal suture line which was controlled using Floseal locally. The mean duration of ventilatory support and ICU stay was 1.5 ± 1 day and 3 ± 1 days respectively. One patient (10%) died on the fourth postoperative day, due to postoperative thromboembolism. The mean duration of hospital stay was 11 ± 4 days (range, 7 to 15 days). Patients were followed up for 2 to 11 months postoperatively and no complications were detected. All patients were in NYHA Class I on follow up.

Conclusions: Composite valve graft replacement of the aortic root remains the treatment of choice for aortic root aneurysms with aortic valve disease. The procedure carries low morbidity and mortality and produces excellent results. Incidence of postoperative bleed can be lowered by preventing needle hole bleed using thrombin preparation like Floseal.

PE37—FOUR-DIMENSIONAL EVALUATION OF MITRAL COMPLEX USING 320-DETECTOR CT

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Objectives: Cardiac Imaging is developing in a new era with a 320-Detector computed tomography (CT) and a high performance workstation. Recently, the four dimensional (4D) CT can represent dynamic motion of intra-cardiac structures synchronized with the cardiac cycle. In surgical plasty of mitral valve, artificial chordae reconstruction is the crucial point. However pre-surgical evaluation of mitral complex is still limited with conventional CT or echo images alone, and intra-operative findings, in arrested heart, was only way to evaluate the valve. In this study we suggest a novel image of dynamic heart motion with 4D-CT, which may be very useful for planning surgical strategy of mitral complex.

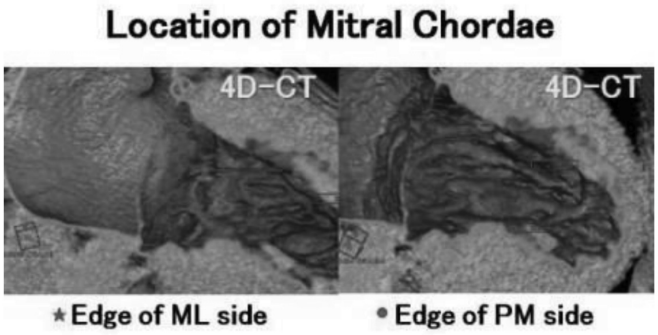
Methods: The area detector CT was performed using the 320-Detector CT, Aquilion ONE (TOSHIBA). For the image post-processing, the volume data were transferred to the workstation, Virtual Place (AZE Ltd.). The 4D volume reconstruction was performed using the "4D" program.

In the beginning, mitral complex was detected at end-systole using 4D images. Next, dynamic motion of mitral complex with the cardiac cycle was obtained by 4D-CT.

Results: The 320-Detector CT could reveal mitral complex. At end-systole, mitral chordae were represented clearly by 4D-CT (Figure 1).

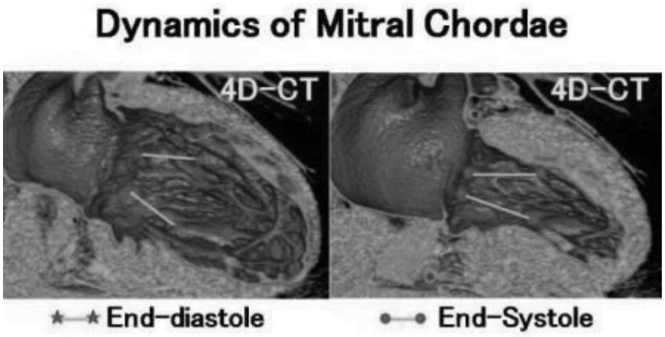
[Figure 1]

The mitral leaflets (ML) and papillary muscles (PM) moved widely in a cardiac cycle. Both edges of mitral chordae were represented correctly by 4D rotated images (Figure 2).



[Figure 2]

The dynamic performance of mitral chordae was evaluated well by 4D-CT (Figure 3).



[Figure 3]

Conclusion:

1. The 320-Detector CT was effective for pre-surgical evaluation of mitral complex.
2. The 4D-CT had great value to represent intra-cardiac structures.
3. The 4D imaging is very useful to make surgical strategy for mitral complex.

PE38—CAN THE PROPHYLACTIC EPICARDIAL ABLATION DONE DURING CORONARY BYPASS SURGERY IN PATIENTS OVER 75 YEARS PREVENT DEVELOPMENT OF ATRIAL FIBRILLATION IN POSTOPERATIVE PERIOD?

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Objective: Advanced age, especially in patients over 75 years the development of atrial fibrillation after coronary bypass surgery is common. This is the prolonged duration of intensive care and discharged from the hospital, increased morbidity-mortality rates and costs brings. In this study, we aimed to show whether there is another benefit to prevent the development of the atrial fibrillation in the postoperative period the application of epicardial ablation.

Methods: Thirty patients, 75 years and over, who underwent isolated coronary bypass surgery were included in the study. The patients were divided in two equal groups. Intraoperative epicardial ablation was performed in 15 patients in group 1.15 patients in group 2 the application wasn't made. Patients in both groups preoperative, intraoperative variables development of postoperative atrial fibrillation and heart rhythm data of first month were collected. The collected data were compared statistically.

Results: There were 8 males and 7 females in group 1, mean age was 78.13 ± 2.29. There were 7 females and 8 males in group 2, mean age was 77.93 ± 2.49. Preop morbidity and mortality wasn't observed in both groups. Preoperative and intraoperative values were not significantly different between the 2 groups were compared. The patients in group 1 weren't observed atrial fibrillation until the postoperative first month. The 7 patients in group 2 (46%) were observed atrial fibrillation in the first two days of postoperative period ($P < .05$) and returned to normal sinus rhythm with antiarrhythmic therapy.

Conclusions: Atrial fibrillation is common at elderly patients that undergoing coronary bypass surgery in the early postoperative period; this situation associated with the prolonged duration of intensive care, prolonged discharge time, increased costs and postoperative morbidity and mortality. We think that intraoperative epicardial ablation will benefit to advanced age patients that undergoing coronary bypass surgery preventing development of atrial fibrillation in postoperative period.

PE39—ON-PUMP BEATING-HEART CORONARY ARTERY BYPASS SURGERY IN ACUTE MYOCARDIAL INFARCTION COMPLICATED BY CARDIOGENIC SHOCK

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Background: Coronary artery bypass grafting in acute myocardial infarction complicated by cardiogenic shock is associated 20-50% operative mortality. Optimal operative strategy for these patients remains controversial. In this report, we assess the efficacy of on-pump beating-heart coronary artery bypass grafting in this cohort.

Methods: Between April 2008 and September 2009, 11 consecutive patients with large anterior myocardial infarctions complicated by cardiogenic shock underwent urgent/emergent coronary artery bypass grafting. On-pump beating-heart strategy was utilized without aortic cross-clamping or cardioplegic arrest. Coronary shunts were employed to prevent further myocardial damage. Preoperative risk factors, intraoperative parameters, and postoperative complications were analyzed.

Results: Preoperatively, the mean ejection fraction was 16 ± 7% and 60% of the patients required intraaortic balloon pump. The mean number of grafts/patient was 3 ± 0.5 and mean cardiopulmonary bypass time was 96 ± 30 minutes. Significant improvement in postoperative ejection fraction was noted (29 ± 9%, $P < .05$). Complications of renal failure, requiring short-term hemodialysis, and prolonged intubation, requiring tracheostomy, were 20% and 30%, respectively. Despite high predicted mortality calculated by EuroSCORE (35 ± 7%), all patients were discharged alive with a final observed mortality of 9% ($P < .05$).

Conclusions: On-pump beating-heart coronary artery bypass grafting is a strategy designed to afford hemodynamic stability provided by cardiopulmonary bypass and prevent additional myocardial injury these patients may not tolerate. It may be an acceptable strategy to improve perioperative mortality in the high risk cohort of patients with acute myocardial infarction complicated by cardiogenic shock.

PE40—EXTENDED INDICATION FOR AXILLARY ARTERY CANNULATION IN CORONARY ARTERY BYPASS GRAFT SURGERY

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Objective: We wanted to evaluate efficacy of right axillary artery cannulation for CBP as better alternative to tackle cerebral complications in aortic atherosclerosis, dissection and elderly CABG patients. Neurological complications are known in surgeries on arch and distal aortic aneurysm and elderly CABG patients with atheromatous, calcified porcelain aorta. Evaluation of aorta by transthoracic Echo cardiography, CT scan, and MRI are useful to detect atherosclerosis, dissection and thrombus. TEE and epiaortic Echocardiography are superior. TEE will reveal lesions in arch and descending aorta and not useful in ascending aorta. Intraoperative epiaortic, echocardiography is more useful in discerning these lesions including mobile thrombi. Under these circumstances alternative routes other than aortic cannulations for CBP will avoid these complications. Femoral cannulation with retrograde perfusion is a cause in cerebral thromboembolic complications. Hence to be avoided.

Methods: 2Dechocardiography, TEE, MRI, Carotid and Peripheral vessel Doppler and Coronary angiogram were performed in all patients. Since 2009 we used right axillary artery cannulation for CBP in patients of CABG with or without mitral valve repair, replacement, elderly above 60 years patients, surgeries on aorta and those detected having aortic atherosclerosis and thrombi. We recorded neurological complications during hospital stay and during follow up.

Observation: Twenty-seven patients had right axillary cannulation for CBP. They underwent CABG, CABG with mitral valve repair or replacement, CABG with aortic valve replacement, Bentall, LV aneurysm repair and redo mitral valve surgery. None of them had cerebral complications. Three patients died due to non thromboembolic and non neurological complications like prolonged ventilation, multiorgan failure, and bleeding. Follow up of 2 years did not show any neurological complications in surviving patients.

Conclusions: None of the patients had neurological complications. The number is small for statistical significance. Lack of complications encourages us to use right axillary artery cannulation for CBP in the subgroup. Later when numbers increase we will compare neurological complications of this group with conventional aortic cannulation group.

PE41—INTRAOPERATIVE VALIDATION OF AORTIC VALVE COMPETENCE DURING "DAVID" PROCEDURE BY CHARACTERISTIC CURVES

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Background: The "David" procedure is demanding and time-consuming. Effective control of success already during X-clamping is therefore helpful in order to limit procedure time. We developed a simple method for early intraoperative control.

Methods: Three valves of 4 types (23mm RootElan [RE], 23mm RootElan with central leakage [REcl], 23mm RootElan with cusp defect [REcd], and 23mm SJM bileaflet valve [BL23] as control) mounted in a modelled ascending aorta were investigated with a saline column of 30 cm. Leakage flow (LF, mL/s) and discharge time of 10 mL leakage volume (DT, s) were determined. Characteristic curves were derived in order to assess severity of aortic incompetence (AI, %).

Results: RE and REcl exhibited only minor incompetence while REcd demonstrated marked insufficiency (table). Curves were characteristic for specific reconstruction problems (figure).

Conclusion: Valve competence can be effectively judged early during reconstruction. Characteristic curves indicate specific problems at an early stage yielding time for additional reconstructive measures or decision towards replacement.

PE42—CORONARY ENDARTERECTOMY OF THE LEFT ANTERIOR DESCENDING ARTERY: AN INCREASING REQUIREMENT FOR COMPLETE REVASCULARIZATION OF ADVANCED ISCHAEMIC HEART DISEASE

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Background-Methods: Patients presenting for coronary artery bypass grafting with diffuse coronary disease are a growing occurrence. Complete revascularization of severely atheromatous left anterior descending artery (LAD) requires endarterectomy concomitant to extended arteriotomy and anastomosis of the left internal mammary (lima). We present our experience with this procedure in 86 consecutive patients with follow-up.

Patients-Methods: We retrospectively reviewed 86 consecutive patients underwent CABG with extended endarterectomy of the LAD. All cases were performed with standard cardiopulmonary bypass, moderate hypothermia and cold blood antegrade and retrograde cardioplegia with hotshot. All patients received aspirin as well as asenokoumarol for the first 3 postoperative months. Follow-up was with regular outpatients echo with adenosine flow-reserve of the LAD, scintigraphy and, if indicated, coronary angiogram

Results: Mean patient age 65.48 years, male/female: 75/11. DM28/86 (35.55%) [type I (n = 3), type II (n = 25)]. Pedicle lima to LAD in n = 84 and with vein interposition to the aorta as free graft to the LAD in n = 2. Mean graft number 2.46 (1-4). RITA also anastomosed in 19/86 (22.09%). Mean CPB and CxC times 120.03 and 96.31 min. Complications: AF (4.88%), VF (2.32%), PPM (1.16%), ileus (1.16%), small bowel ischaemia (1.16%), CVA (1.16%), STEMI (2.32%). 30 day mortality (1.16%) Mean post-operative stay: ICU 2,04, total hospital stay 8.88 days. F-U (81/86): after mean of 3.4 years MACE free survival was 72/81 and cumulative survival was 77/81. 5/8 LIMAs patent in coronary angios performed when indicated. Multi-variate analysis of death revealed low pre-op LVEF, non-use of >1 arterial graft and evidence of new post-operative anterior wall dysfunction as risk factors for MACE.

Conclusion: Endarterectomy and reconstruction of the LAD with extended anastomosis of the LIMA is low-complication technique. It offers a safe alternative to conventional bypass surgery and acceptable mid-term survival, achieving more complete revascularization in diffuse atheromatous coronary disease.

PE43—CARDIOTROPIC VIRUSES TRIGGER ANTIBODY MEDIATED REJECTION IN HEART TRANSPLANTATION RECIPIENTS

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Purpose: Antibody mediated rejection (AMR) is an important prognostic factor after heart transplantation (HTx). The impact of cardiotropic viruses on the development of AMR has not yet been studied.

Methods: Biopsies (n = 249) obtained from 100 pts (84 men) undergoing HTx in 1986-2006 were evaluated prospectively (FU1 = 4 weeks, FU2 = 1 year, FU3 = 3 years, FU4 = 5 years post HTx) for acute cellular rejection (ACR, ISHLT grading) and AMR by immunohistochemistry (C4d, CD68). PCR was used to test for endomyocardial and systemic infection with cardiotropic viruses (HCMV, HSV1, HSV2, HHV6, EBV, PVB19, enteroviruses, adenoviruses).

Results: In FU1 48% of pts showed an AMR. This rate remained nearly stable during further follow-ups (FU2 = 42%, FU3 = 37%, FU4 = 44%). ACR of any grade was found in 38% of cases in FU1 and affected less than 10% thereafter (FU2 = 21%, FU3 = 4%, FU4 = 8%). EBV was the most frequent virus in endomyocardium (EM) and in serum (S, FU1: EM = 36%, S = 26%; FU2: EM = 44%, S = 46%; FU3: EM = 24%, S = 35%; FU4: EM = 39%, S = 59%).

There was no stable correlation between type and extent of systemic or endomyocardial virus infection. Systemic virus infection was not correlated with ACR or AMR in each FU. Virus infection in EM was not associated with ACR in any FU, but with AMR at mid-term post HTx (FU3: r = 0.501, $P = .001$; FU4: r = 0.281, $P = .05$). Sixty percent of pts who had had HTx at least 5 yrs before and tested positive for viruses in their EM showed no AMR ($P = .007$).

Conclusion: Cardiotropic viruses are associated with AMR mid-term post HTx. In the long-term (5 years and more) post HTx EM becomes accustomed to cardiotropic viruses. Immunological activity adapts and does not trigger AMR. Nevertheless, PCR for cardiotropic viruses should complement current diagnostics to better identify pts at risk for AMR.

PE44—BRANCHED MAMMARY ARTERY USING RADIAL ARTERY FOR MYOCARDIAL REVASCULARIZATION

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Objectives: The purpose of this paper is to describe our experience using a "branched" mammary artery (LIMA) for myocardial revascularization, using a radial artery as a "T" graft anastomized end to side to the LIMA and a little piece of LIMA harvested as Y graft and anastomized and to side to the LIMA. All the procedures were performed on beating heart. The use of branched LIMA for CABG depends on stenosis localization. When narrows are proximal on left anterior descending (LAD) and on the first diagonal branch, the use of LIMA harvested as Y graft is granted. The use of LIMA as unique conduit depend on anatomical condition. The length of LIMA must be enough to preserve a distal piece of it to harvest the Y branch.

Methods: From December 2007 to December 2010 four patients (three male and one female) underwent this procedure. In three cases the diagnostic angiogram showed a significative stenosis of the left main and in one case a multiple coronary artery disease. The procedure was performed harvesting LIMA as in situ pedicled graft, the radial artery of the non dominant arm was anastomized, end to side, to the same LIMA as "Y" graft. The LIMA was anastomized to the LAD, the "Y" branch to the first diagonal and the radial artery used as a single graft to the OM (obtuse marginal), in two cases or sequential graft to the OM and PDA (posterior descending artery) in two cases. All patients were discharged from three to five days after the operation.

Conclusions: The technique is easily performed and according to coronary anatomic conditions provides complete arterial revascularization with good perioperative results.

PE45—SINGLE CENTER EXPERIENCE IN SURGICAL TREATMENT OF POSTINFARCTION LEFT VENTRICULAR FREE WALL RUPTURE

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Background: One of the most life-threatening complication of acute myocardial infarction is left ventricular free wall rupture (LVFWR). LVFWR occurs in 2-6% of cases presenting with acute myocardial infarction.

Aim: The objective of the study is to present our results of surgical treatment of LVFWR.

Methods: From December 2004 to February 2011, 10 patients with LVFWR were operated on in our department. The mean age was 73 ± 8 ranging from 56 to 88 years; there were 4 males and 6 females. Clinical diagnosis of LVFWR was based on the clinical signs and was confirmed by bedside transthoracic echocardiography which in some cases was verified by transesophageal echocardiography in the operating room. All patients were operated via median sternotomy as an emergency procedure. After the pericardium was opened, blood and clots were evacuated and all patients showed rapid hemodynamic improvement.

Results: We used different surgical techniques for wall repair (Table).

Table. Different surgical techniques for LVFWR.

No	Sex	Age	ECC	No ECC	Clinical outcome
1	F	73	-	Patch glue and 1 SVG	discharged
2	M	71	-	Patch glue	discharged
3	M	70	SVR	-	discharged
4	F	79	Direct suture and 2SVG	-	died
5	M	69	-	Patch glue	discharged
6	F	81	Direct suture	-	died
7	F	74	-	Direct suture	discharged
8	F	56	Direct suture and patch glue	Patch glue	discharged
9	F	76	-	Patch glue and 1 SVG	discharged
10	M	88	Direct suture and patch glue	-	died

Patch glue (sutureless combination of patch [TachoComb plus Surgicel] and glue), direct suture (horizontal mattress sutures passed through strips of Teflon), ECC (extracorporeal circulation), SVR (left ventricular plasty by Dor method with the Dacron patch), SVG (saphenous vein graft).

We have lost three patients in the mean age 83 ± 5 years old, (2 women, 1 man) operated in ECC. They died on operating table. We could not weaned them from ECC because of low cardiac output.

Conclusion: In patients with LVFWR early surgical treatment is crucial for successful outcome. The risk factors of surgical therapy failure in our study are advanced age of patients, necessity of the use of ECC and female gender.

PE46—PROGNOSIS OF CARCINOID HEART DISEASE AFTER CARDIAC SURGERY IN 16 CASES

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Background: Advances in medical and oncological therapies have improved survival in patients with carcinoid tumors, and cardiac involvement has become a major source of morbidity and mortality in these patients. It is well known that cardiac surgery in carcinoid heart disease carries a high risk of perioperative mortality. We retrospectively reviewed 16 patients with carcinoid heart disease who underwent heart valve surgery in the past 11 years.

Methods: We retrospectively studied all cardiac surgery cases between January 2000 and February 2011 at our center. Sixteen patients with carcinoid heart diseases were identified. Their preoperative status and the outcome of cardiac surgery were reviewed. The end point was all-cause mortality. Actuarial survival rates were studied using the Kaplan-Meier method.

Results: Age of the 16 patients was 61.4 ± 16.4 years (mean ± SD) (male 62.5%). All of the 16 patients with carcinoid heart disease showed a tricuspid regurgitation grade of ≥3 preoperatively and had surgery for tricuspid valve disease: 12 tricuspid valve replacements with bioprosthetic valve and 4 cases of tricuspid valve repair. Concomitant pulmonary valve replacement was performed in 5 cases. Liver metastasis was seen in all cases. Preoperative left ventricular ejection fraction (LVEF) was 60.0 ± 7.4% and right ventricular ejection fraction was 48.0 ± 10.6%. Postoperative 30-day mortality was 14.2%, and 2-year actuarial survival was 50.3%. The longest survival time after cardiac surgery was 4.9 years.

Conclusion: Even though preoperative LVEF was relatively good, the prognosis after cardiac surgery for carcinoid heart disease was poor. This should be kept in mind when considering cardiac surgery in patients with carcinoid disease.

PE47—SINGLE CENTER EXPERIENCE IN WRAPPING TECHNIQUE FOR THE TREATMENT OF ANEURYSMS OF ASCENDING AORTA

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Background: The aortic Dacron wrapping technique is a surgical technique used under certain circumstances in cases of isolated ascending aorta dilatation. This method of treatment is used especially for patients with of high risk conventional surgical resection. We present one year follow-up after reduction aortoplasty with external wrapping of the ascending aorta.

Methods: From November 2007 to August 2010, 9 high risk patients (mean EuroScore 11.4) 8 male, 1 female with ascending aortic dilatation, were operated on with the wrapping technique in our department. Wrapping technique was chosen to shorten aortic X clamp time. All patients had normal diameter of aortic root and sino-tubular junction. None of them had any calcifications in the aortic wall. To assess diameter of aorta one year after wrapping procedure the transthoracic echocardiography was made.

Results: In two cases aortic aneurysm was the only indication for surgery, we performed isolated reduction aortoplasty without ECC. In one of them wrapping was performed around brachiocephalic artery and part of aortic arch (hemiarch). In other patients wrapping of the aorta accompanied other cardiac surgery procedures (Table).

No	Sex	Diameter of ascending aorta (cm)		OPCAB	CABG	AVR	MVR/MVP
		Before surgery	One year after surgery				
1	M	6,3	3,3	+	-	-	-
2	F	4,9	4,2	-	-	-	-
3	M	5,3	Reoperation, Bentall method	-	-	+	+
4	M	6,6	3,8	-	-	+	+
5	M	5,1	4,6	-	-	-	-
6	M	4,6	4,6	-	+	+	-
7	M	4,8	4,2	-	-	-	+
8	M	4,9	4,2	-	-	+	-
9	M	5,1	4,4	-	+	+	-

The postoperative course was not complicated. We also did not notice any neurological impairment. In transthoracic echocardiography performed in postoperative period and one year after surgery we did not notice any dilatation of ascending aorta.

Conclusion: Reduction ascending aortoplasty with wrapping technique is a safe and simple procedure with excellent one year follow-up results in high risk patients.

PE48—AUDIT OF CURRENT ANTIBIOTIC PROPHYLAXIS AGAINST RISK OF INFECTIVE ENDOCARDITIS CAUSED BY DENTAL PROCEDURES

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Objectives: Antibiotic prophylaxis against risk of infective endocarditis (IE) has been debatable since the release of the British National Institute of Clinical Excellence (NICE) guidelines in 2008. The departure from tradition and the differing recommendations from other regulatory bodies has led to mixed and often confusing practice. We aim to evaluate compliance among UK dentists to the current NICE guidelines regarding IE prophylaxis.

Methods: 200 dental practices across the UK were surveyed either by a telephone/email questionnaire; detailing their practice.

Results: 46.5% (93/200) responded. 96% (89/93) of the respondents recognized the existence of NICE guidelines. 16% (15/93) were also aware of the Department of Health recommendations. 37.5% (35/93) still prescribed prophylaxis to patients selectively. 46% (43/93) risk stratified cardiac surgical patients and prescribed to those deemed 'high risk'. Pre-op valvular disease was considered high risk by 31% (29/93) of respondents, congenital heart disease by 20.5% (19/93) and post-op valvular patients by 15% (14/93). 6% (5/93) of dentists prescribed prophylaxis to all pre- and post-op cardiac patients regardless of risk. Everyone prescribed 3g amoxicillin or suitable alternative due to allergy (previous guidelines).

Conclusion: This audit demonstrates that a significant proportion of dentists do not comply with current guidelines and inappropriately prescribe prophylaxis. This unnecessary antibiotic use carries risks to the individual patient, may increase incidence of IE or antimicrobial resistance, and is not cost effective.

PE49—REDUCED PERFORATION RATES WITH DOUBLE INDICATOR GLOVING IN CARDIAC SURGERY

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Objectives: The use of double gloving is supposed to reduce surgical cross-infection. In a prospective study in cardiac surgical procedures the frequency and site of glove perforation was determined in all surgical team members.

Methods: A total of 1,361 gloves from cardiac surgical team members were collected at the end of the operation. 83% were using double gloving (Biogel Indicator System). Surgical procedures were distributed as follows: Coronary artery bypass 52%, valve replacement 15%, combined procedures 24%, and miscellaneous 9%. All gloves were collected during and at the end of the surgical procedure. All holes were detected by standardized methods and the single holes analyzed by microscope.

Results: In double gloving 84% showed no perforations. In 14% the outer glove was perforated were the inner glove was perforated only in 2%. After applying bone wax the outer glove was perforated in 9% with

no perforation of the inner glove. In 18 % of outer gloves perforations were found after knotting the cardiac valve prosthesis in place. If double gloving was compared to single gloving eg, in coronary artery bypass surgery the inner glove was perforated in 1.7% only (outer glove 13.6%) while the single glove was perforated in 19.8%. In valve procedures the difference was even more significant (1.5% versus 25.8%).

Conclusions: During cardiac surgical procedures perforations of the inner glove is less than 2% compared to 20-25% if single gloves are used. This result implicated a ten-time higher protection by using double gloving.

PE50—SUCCESSFUL TREATMENT OF ACUTE ACTIVE ENDOCARDITIS USING SORIN SOLO PERICARDIAL STENTLESS BIOPROSTHESIS

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Introduction: Acute bacterial endocarditis remains the most challenging situation requiring aortic valve replacement (AVR), especially when associated with annular infection and/or the presence of abscess which increase the risk of postoperative paravalvular leakage. The choice of the best prosthesis for AVR in acute endocarditis is still matter of debate. Here we present our preliminary experience in the treatment of acute aortic valve endocarditis using the Sorin Solo stentless pericardial bioprosthesis.

Materials and methods: We analyzed data from 8 patients (6 males and 2 females, age ranging from 37 to 71 years) affected by acute endocarditis who received Sorin Solo bioprosthesis. According to current guidelines surgery was considered in presence of persistent septic status, gross vegetations with risk of peripheral embolism and significant aortic valve dysfunction. Staphylococcus aureus was the etiologic agent in the majority of patients (88%). Abscesses were present in 5 patients (63%). Five patients (62%) had native aortic endocarditis and 3 patients (38%) mechanical prosthesis endocarditis.

Results: All but 1 procedure were performed through a ministernotomy. Pericardial patch exclusion of abscesses was necessary in 5 patients (62%). There were no operative mortality. Among early complications, a moderate to severe piastrinopenia was detected in 6 patients (75%). The follow up (6 to 32 months) was 100% complete. There were no cases of late death (survival probability of 100%) and no cases of persistent or recurrent endocarditis. All pts are in NYHA class I or II.

Conclusion: Sorin Solo prosthesis seems to warranty successful and uneventful AVR treatment in case of acute endocarditis even in case of presence of aortic abscess. Based on our experience we do support such prosthesis in this peculiar clinical setting.

PE51—PATIENT-PROSTHESIS MISMATCH IS SIGNIFICANTLY REDUCED AT IDEAL BODY WEIGHT

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Objective: Patient-prosthesis mismatch (PPM) results in high transvalvular gradients, which may lead to increased mortality after aortic valve replacement (AVR). PPM calculation is based on body surface area (BSA) determination, which in turn, relies on patient weight. The objective of the present study was to determine whether the incidence of PPM would be significantly reduced at ideal body weight.

Methods: A prospective examination of 50 patients undergoing isolated tissue AVR at our institution was performed. *In vitro* effective orifice area (EOA) estimates were obtained for the 5 different valves implanted. BSA was calculated using 5 formulae and ideal body weight was defined as the mean result obtained using the Devine, Miller, Robinson and Hamwi equations. PPM was defined as indexed EOA (EOAI) < 0.85, and severe PPM was defined as EOAI < 0.65, with calculations performed using actual and ideal body weights. A Student's t-test was used for comparison.

Results: The mean age was 69 ± 9.3 years (50% men), mean height and weight were 167 ± 8.3 cm and 78 ± 15 kg, respectively. The average gradients after AVR were 21 ± 7.3 and 12 ± 4.8 mm Hg (Pmax/mean), respectively. The mean EOA of the implanted prosthesis was 2.03 ± 0.42 cm^2, and mean BSA ranged from 1.87 ± 0.20 to 1.93 ± 0.22 using the various formulae. There were no cases of severe PPM in this series. At ideal body weight, the incidence of moderate PPM was significantly lower than at actual body weight ($P < .05$, see table).

Conclusions: Weight reduction from actual to ideal body weight after AVR would significantly reduce the incidence of PPM.

BSA FORMULA	MODERATE PPM AT ACTUAL WEIGHT	MODERATE PPM AT IDEAL WEIGHT	*P* VALUE
MOSTELLER	7/50 (14%)	1/50 (2%)	$P < .05$
DUBOIS	5/50 (10%)	1/50 (2%)	NS
GEORGE-GEHAN	7/50 (14%)	1/50 (2%)	$P < .05$
HAYCOCK	7/50 (14%)	1/50 (2%)	$P < .05$
BOYD	7/50 (14%)	1/50 (2%)	$P < .05$

INFLUENCE OF BODY WEIGHT ON PPM

PE52—BI-LEVEL POSITIVE AIRWAY PRESSURE SUPPORT FOR RESPIRATORY INSUFFICIENCY AFTER ADULT CARDIAC SURGERY

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Objective: Respiratory insufficiency is a serious complication after adult cardiac surgery, which severely affects morbidity and mortality. Noninvasive positive pressure ventilation (NPPV) has become a standard of care in acute respiratory failure. However, little and controversial data are available on its usefulness in post-extubation failure after major surgery and in particular after adult cardiac procedures. The primary purpose of this 5-year pilot survey was to document the safety of using Bi-level positive airway pressure support after adult cardiac surgery.

Methods: 520 patients underwent cardiac surgery were chosen for this study during December 2005 to December 2010. Those patients were divided into NPPV group with Bi-level positive airway pressure support (N group, n = 38, and control group C group, n = 482). The baseline clinical parameters in the two

groups were respectively recorded. During Bi-level positive airway pressure support, mean arterial pressure, heart rate, respiratory rate, arterial pH, arterial oxygen saturation, pulmonary arterial pressure, arterial carbon dioxide saturation, arterial oxygen tension (oxygen/inspired oxygen fraction ratio) and alveolo-arterial oxygen partial pressure difference were measured at before NPPV 8h, after NPPV 8h, 16h, 24h, 32h, 40h, 48h, and some of them were recorded on the 72h, 96h, 120h.

Results: The prevalence of current smoking patients, elder age, low oxygenation index, low endogenous creatinine clearance rate, with COPD may be risk factors of respiratory insufficiency. The mean length of NPPV was 40.8 ± 13.2 hours. Mean arterial pressure, heart rate, respiratory rate, pulmonary arterial pressure and alveolo-arterial oxygen partial pressure difference were significantly lowered after NPPV treatment ($P < .05$), and partial pressure of oxygen, blood oxygen saturation were significantly improved ($P < .05$). NPPV prevented intubation in 92.1% of the patients, with satisfactory recovery for post cardiopulmonary bypass lung injury, cardiogenic dysfunction and atelectasis, and poor results in those treated for pneumonia.

Conclusion: In appropriate candidates, Bi-level positive airway pressure support exerts favorable effects on lung function, preventing reintubation.

PE53—MITRAL VALVE REPAIR WITH A NOVEL LOOPING AND KNOTTING DEVICE

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Objective: We developed a simple and quick technique to create multiple artificial chordae loops for mitral repair with a novel looping and knotting device.

Methods: The device consists of a semicircular metal base with several circumferential rods fixed to one side and a threaded, removable central rod with knurled knob on one end that can be attached or removed by screwing into a hole located at the center of the semicircle. Ten rods are placed radially in an arc around the central rod at distances of 16-25 mm from the central rod, as shown by the numbers printed on the device base. A needle with CV5 e-polytetrafluoroethylene suture is passed through a small pledget, and the suture is looped from the central rod around the circumferential rod located at the desired loop length. The needle is then passed back through the pledget. The suture is tied over the pledget, bringing it in contact with the central rod. If multiple loops are required, one of the needles is passed through the pledget again, and the same maneuvers are repeated. Following creation of the necessary loops, the central rod is unscrewed, and the loops are released from the device. Finally, the needles of the loops are passed through the tip of the respective papillary muscle and tied over a second pledget. The loops are fixed to the prolapsing leaflet segments using additional sutures, and the artificial chordae replacement is completed.

Results: This technique allows preparation of multiple loops of various lengths. The unique design and stability of the device allow a single surgeon to quickly and precisely create neo-chordae. The device can be sterilized by autoclave, allowing regular reuse.

Conclusion: Artificial chordae construction with this novel device is quick, reliable, reproducible, and increases the technical possibilities for repair of mitral valve regurgitation.

PE54—RENIN-ANGIOTENSIN ANTAGONISM SYSTEMS AND ACUTE KIDNEY INJURY AFTER CARDIAC SURGERY. A META ANALYSIS OF OVER 20,000 PATIENTS

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Objectives: Acute kidney injury (AKI) after cardiac surgery is associated with an increased risk of mortality. Several studies report controversial results with regard to the effect of angiotensin converting enzyme inhibitors (ACEI) and angiotensin receptor blockers (ARB) on postoperative renal function. The aim of the study was to estimate the risk of preoperative angiotensin antagonism on AKI in patients undergoing cardiac surgery.

Methods: A systematic review of all studies reporting the impact of preoperative ACEI/ARB therapy on the incidence of AKI after cardiac surgery was performed.

Results: Six observational studies were identified reporting the incidence of postoperative AKI in 22,304 patients having cardiac surgery with (n = 8216, 36.8%) or without (n = 14,088; 63.2%) preoperative ACEI/ARB use. Postoperative AKI was significantly higher (8.6% versus 6%, $P < .0001$) in patients undergoing cardiac surgery who received preoperative ACEI/ARB treatment compared with controls. Pooled analysis showed a 41% of increased in the risk of AKI (OR 1.41, 95%CI 1.07 to 1.87; $P = .01$ for overall effect) in patients receiving ACEI/ARB therapy before cardiac surgery.

Conclusions: Cumulative analysis of studies currently available in literature documents that preoperative angiotensin antagonism therapy is associated with increased in the risk of postoperative acute kidney injury. Randomized trials need to confirm these data.

PE55—ASSESSMENT OF PROTECTIVE EFFECTS OF WARM TERMINAL BLOOD CARDIOPLEGIA ON MYOCARDIAL PROTECTION IN CABG

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A significant metabolic derangement occurs in the ischaemic-reperfused heart of patients undergoing coronary artery bypass surgery using cold blood cardioplegia [i]. It has been reported that up to one forth of deaths after coronary artery bypass grafting surgery may be caused by Reperfusion injury especially in patients with higher NYHA classes. There are evidences that in adult cardiac operations, a warm cardioplegic reperfusate (hot shot) before removing the aortic cross-clamp improves post bypass myocardial function and metabolic recovery [ii]. We randomly assigned 41 consecutive patients undergoing primary, elective CABG into two groups; TWBC Group who received Terminal Warm Blood Cardioplegia just before removing of Aortic cross clamp (n = 24) and second group

(Control) did not received TWBC (n = 17). Among patients in CONTROL group 41% (95% CL: 19-62%) received at least one inotrope, but only 17% (95% CL: 0-35%) of patients in TWBC group did so (P = .085). Also in respect to EF there was superiority in TWBC group only in patients with low pre operative EF. There was higher rate of spontaneous beating in TWBC group (21 of 24 or 88%) versus Control group (12 of 17 or 70%; $P < .1$).

Conclusion: It seems prudent to routinely use Terminal Warm Blood Cardioplegia in patients undergoing coronary bypass graft especially in those with reduced ventricular function.

PE56—POSTOPERATIVE BRIDGING THERAPY WITH LOW-MOLECULAR-WEIGHT-HEPARIN IN PATIENTS AFTER HEART SURGERY: RESULTS FROM CLINICAL OBSERVATION AND SERIAL ANTI-XA-MEASUREMENTS

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Objectives: Low molecular weight heparin (LMWH) can be used as alternative bridging therapy to intravenous unfractionated heparin in patients who require oral anticoagulation after heart surgery. We present the clinical results of a series of patients who had bridging therapy with LMWH postoperatively and evaluated in a subanalysis whether serial measurement of Anti-Xa-activity may be able to guide therapy.

Methods: Over a period of 6 months all patients with an indication for oral anticoagulation (valve replacement or repair, atrial fibrillation, cardiac tumors) operated in our centre were included. The clinical course was followed for 30 days looking for adverse events like bleeding, rethoracotomy and thromboembolic events. Anti-Xa-activity (therapeutic range 0.7-1.1) was serially measured (preoperatively, after surgery, first, second, fourth and sixth postoperative day) in 62 patients.

Results: From 482 included patients 31 patients (6.4%) required a rethoracotomy of which 18 (3.7%) were later than postoperative day three with diffuse bleeding. We observed 10 patients with severe neurologic deficits, which were classified as thromboembolic events but only three later postoperatively. No other thromboembolic events were seen.

Anti-Xa-activity was subtherapeutic during the bridging period.

	preop	After OP	1.pod	2.pod	4.pod	6.pod
Anti-Xa	0.25±0.41	0.6±0.56	0.43±0.16	0.58±0.23	0.63±0.37	0.56±0.34

Course of Anti-Xa-activity

Conclusion: Our study showed that postoperative bridging therapy with LMWH is safe regarding thromboembolic events but causes more late tamponades, probably due to the earlier effective anticoagulation. Serial Anti-Xa-measurements are not useful to control postoperative bridging therapy with LMWH. Further studies with alternative dosage schemes of LMWH are required.

PE57—AORTIC VALVE REPLACEMENT WITH THE SORIN CARBOMEDICS TOP HAT PROSTHESIS YIELDS EXCELLENT FUNCTIONAL RESULTS EVEN IN COMPLEX CASES

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Objectives: Mechanical aortic valve replacement is a convincing option for patients not qualifying for valve repair. Supraannular implantation is desired to optimize hemodynamic performance. We present our single-surgeon single-center experience with fifty consecutive Carbomedics Top Hat valves. Size distribution, early gradients, and in-hospital complications are reported.

Methods: Fifty Top Hat valves were consecutively implanted. Mean age was 60.5 ± 13.6 years, logistic EuroSCORE was 10.7 ± 11.1%, BMI was 27.1 ± 5.3 kg/m^2. There were 26 single, 21 double, and 3 triple valve procedures. Thirteen of these (26%) were done with CABG. Additional aortic or carotid surgery was occasionally performed. 30% of procedures were isolated aortic valve replacements. The rate of redo and endocarditic cases was 20% each. In-hospital morbidity and mortality were assessed. Echocardiographic gradients were measured prior to discharge.

Results: The 21 mm valve (n = 9) showed a mean gradient of 9.9 ± 5.6 mmHg, the 23 mm valve (n = 28) 15.8 ± 6.4 mmHg, the 25 mm valve (n = 13) 13.0 ± 4.1 mmHg. Valve size was about 1.6 mm larger in men than in women. No significant relationship between size and gradient was detected. There was no valvular insufficiency, paravalvular leak, or coronary obstruction. Various morbidity was seen reflecting the high occurrence of complex surgery. The rate of neurologic events was low (2%). One valve thrombosis due to HIT-II was encountered. In-hospital mortality reached 4%.

Conclusions: The supraannular Top Hat valve can be safely implanted even in the complex surgical setting. Overall in-hospital mortality and valve-related morbidity were low. The valve exhibited low early gradients, which may improve long-term recovery.

PE59—NEUROLOGICAL OUTCOME IN PATIENTS RECEIVING VENO-VENOUS VERSUS VENO-ARTERIAL EXTRACORPOREAL MEMBRANE OXYGENATION

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Purpose: To evaluate the neurological outcome in patients receiving Veno-Venous (VV) ECMO versus patients receiving Veno-Arterial (VA) ECMO.

Methods: This retrospective study included patients who were supported with ECMO at our institution between January 2009 and June 2010. Inclusion criteria were patients with ECMO support of ≥ 1 day. All patients were anticoagulated with Heparin. Differences in the neurological outcome, based on post ECMO neurological examinations and/or CT scans, between these 2 groups were compared.

Results: Fifty-eight ECMOs were implanted. The inclusion criteria were met by 40 patients (69%). Eight patients (20%) received VV ECMO due to respiratory failure, and 32 patients (80%) were supported with VA ECMO for refractory cardiogenic shock. The mean age in VA and VV ECMO group was 58 Y (SD = 16) and 52 Y (SD = 16) respectively. No statistically significant differences in the preimplantation parameters were observed between these two groups. All of the VV ECMO implantations were performed through direct cannulation of the peripheral veins. Meanwhile, only 17 (53%) patients in the VA ECMO group received transfemoral ECMO support. None of these patients had history of stroke or significant carotid stenosis prior to ECMO implantation except for one patient in VA group. The mean ECMO support was 6 ± 4 and 7 ± 6 days in patients with VA and VV ECMO respectively (P = .3). The 30 day mortality rate was 53% in VA ECMO group versus 62% in VV ECMO group. Five patients (63%) in the VV ECMO group and 5 patients (16%) in the VA ECMO group developed intracranial bleeding, which was verified by CT scan, after ECMO implantation (P < .05).

Conclusions: There may be an increased tendency to develop intracranial bleeding in patients receiving VV ECMO compared with patients with VA ECMO. Additional prospective studies are necessary to confirm this finding.

PE60—PERIOPERATIVE INTRAMYOCARDIAL IMPLANTATION OF AUTOLOGOUS BONE MARROW DERIVED STEM CELLS DURING CORONARY ARTERY BY PASS GRAFTING SURGERY—INITIAL OBSERVATIONS AND EXPERIENCE

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Objective: In patients with severely impaired myocardial perfusion and low left ventricular ejection fraction, due to previous myocardial infarctions, we performed perioperative intramyocardial implantation of autologous bone marrow stem cells in peri-infarct zone of left ventricle during CABG. We try to improve perfusion and contractility of impaired regions of left ventricular myocardium in order to reduce or prevent left ventricular remodeling process.

Methods: From iliac crest we aspirated 100 mL of bone marrow and process it to 10 mL suspension of stem cells. Following CABG, we implant stem cells by multiple intramyocardial injections in peri-infarction region of left ventricular wall, visually identifying viable myocardium and avoiding fibrous scar tissue.

Results: Procedures were performed in 14th patients, and follow up period is from 3 months to 5 years. Improvement of perfusion and regional wall motion and prevention in remodeling progression was recorded on g-SPECT, dobutamin stress Echo and MSCT scan after 6 months, and every year after. LVEF rise from average 35,0% preoperative to average 45.9% postoperative (average preoperative wall motion score index of 16 segments of heart was 1.803, and postoperative 1,548). Improvement in NYHA class is evident for all patients. No peri procedural or post procedural side effects was noted.

Conclusions: Procedure is safe, do not aggravate risk in CABG itself, and postoperatively contribute to better perfusion and function of left ventricle.

PE61—GENDER VARIABILITY OF CLINICAL SYMPTOMS IN ADULT PATIENTS OPERATED ON THE VALVE PATHOLOGIES

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Purpose: To study gender-specific adult patients operated on the heart valves and evaluation of gender differences as a factor possibly influencing hospital mortality.

Methods: The study retrospectively included 1095 adult patients (aged 18) who in 2009 performed the operation on one or more valves. The analysis included 20 parameters. Data were processed using SPSS.

Results: The operated women were significant at 2.5 ± 0.8 years (95% CI 0.9-3.9) P = .000 older men. Statistically significant differences between the structure of operations on the mitral and aortic valve in females and males (P = .000). Women less likely than men to perform operations on the other (aortic and/or tricuspid) valve and mitral reconstruction performed. Women are less likely than men implanted with a mechanical prosthesis. On average, men pressure gradient on the aortic valve was by 4.3 ± 6.6 mm Hg (95% CI 4.5-18.6), P = .006 compared with women. Fibrillation, atrial flutter in men recorded significantly less likely than women OR = 0.434 (95% CI 0.33-0.56), P = .000, but men more frequently detected infective endocarditis OR = 3.2 (95% CI 2.18-4.81) P = .000; hypertension OR = 1.56 (95% CI 1.18-2.06) P = .000; myocardial infarction in the history of OR = 2.8 (95% CI 1.47-5.41) P = .001. On average, during the operation in men time duration of cardiopulmonary bypass was greater in 11.5 ± 3.6 min (95% CI 4.5-18.6), P = .002, and 8.7 ± 2.4 min (95% CI 3.9-13.4), P = .000, during aortic clamping, respectively. For such parameters as pulmonary artery pressure, left ventricular ejection fraction, end-diastolic left ventricular size, duration of treatment after the surgery, presence of CAD, diabetic, operations with extracorporeal circulation in the history of implanted pacemaker proceeds to significant differences between women and men were not identified.

Conclusions: Among adult patients undergoing surgery of heart valves (in combination with or without correction of concomitant cardiac pathology) demonstrated significant gender differences in age, the pressure gradient on the aortic valve, the structure of operations on heart valves, the incidence of atrial fibrillation, infective endocarditis, hypertension, myocardial infarction in history, time of cardiopulmonary bypass and aortic clamping time.

PE62—CARDIOPLEGIC SOLUTION HAS NO IMPACT ON CLINICAL OUTCOME IN ISOLATED AORTIC VALVE REPLACEMENT

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Objectives: Cardiac arrest during aortic valve surgery is most commonly induced by cold blood or cold crystalloid cardioplegia. The results from clinical studies are divergent regarding which of the two solutions provides better myocardial protection. The aim of this study was to compare the clinical outcome after isolated aortic valve replacement using two different cardioplegic solutions.

Methods: Clinical data and outcome of 202 patients (70.8 ± 10.4 years) who underwent isolated aortic valve replacement (AVR) with either blood (group BC; n = 50) or crystalloid cardioplegia (group CC; n = 152) were retrospectively analyzed. Postoperative creatinine kinase (CK) and the isoenzyme MB (CK-MB), intraoperative and postoperative need of inotropics as well as the postoperative left ventricular pump function (EF) were compared between the two groups.

Results: Patient preoperative characteristics of both groups were comparable. The in hospital mortality was 3.0% in group BC and 2.6% in group CC (ns). Operative variables regarding operation time and x-clamping time were similar. The postoperative course in both groups were comparable concerning the ICU stay, need of inotropic drugs, duration of mechanical ventilation, rate of blood transfusions, perioperative myocardial infarction, and the postoperative EF. Furthermore, there was no difference in the course of CK and CK-MB.

Conclusions: Our clinical analysis revealed no impact on the clinical outcome in isolated AVR with concern of two different cardioplegic solutions.

PE63—HEART VALVE SURGERY IN DIALYSIS-DEPENDING PATIENTS IS STILL ASSOCIATED WITH POOR SURVIVAL RATES

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Background: Open-heart surgery carries a high risk for hemodialysis patients. This concerns the initial clinical course as well as further follow-up. This study focuses on the short and long-term outcomes of hemodialysis patients undergoing heart valve surgery.

Patients and Methods: Seventy-eight hemodialysis depending patients underwent heart valve surgery in our department between Jan. 1996 and Dec. 2006. 38.5% (n = 30) underwent isolated aortic valve replacement (AVR), 7.7% received isolated mitral valve surgery. In addition multiple valve surgery (n = 24; 30.7%) and combined valve and CABG surgery (n = 18; 23.1%) were performed. Mechanical prosthesis was used in 47 patients (60.3%). Operative (30 days) mortality and late survival was analyzed.

Results: Overall hospital survival was 79.5%. Actuarial survival at 1 year, 5 and 7 years was 61.5%, 30.8%, and 25.6%. Outcome was impaired in combined and multiple procedures compared to isolated valve surgery (P = .003) but not the type of prosthesis. Clinical status of the patients demonstrated improvement concerning NYHA and CCS status (P = .003)

Conclusions: Patients on dialysis still have a high risk of perioperative mortality and poor long-term survival rates in heart valve surgery. Mortality is higher and survival is worse after combined CABG and valve-related procedures or multiple valve surgery than after isolated valve surgery. Prognosis seems not be related to the type of prosthesis. Despite limited survival rates, vale surgery seems to be associated with improvement of the clinical status in this patient group.

PE64—SURGICAL THERAPY OF MITRAL VALVE IN PATIENTS WITH SEVERE IMPAIRED LEFT VENTRICULAR FUNCTION

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Background: Mitral valve surgery in patients with impaired left ventricular function remains a particular challenge as numerous studies have identified a severe left ventricular dysfunction as an indicator for a poor prognosis. The aim of the study was to asses the follow-up after mitral valve surgery and severe left ventricular dysfunction.

Patients: Eighty-nine patients (50 male, 39 female; 70.6 ± 8.7 years) with severe impaired left ventricular ejection fraction (mean EF 29.6 ± 5.2%) undergoing mitral valve repair (n = 53) or mitral valve replacement (n = 36) were investigated. All patients received maximal drug therapy. Sixty-two patients (69.7%) were New York Heart Association (NYHA) class III or IV. Follow-up with echocardiography, ECG, and chest x-ray was performed in all survivors. The mean duration of follow-up was 3.9 ± 2.8 years.

Results: The mean duration of ICU and hospital stay was 4.2 ± 25 days and 16.1 ± 12 days, respectively. Hospital mortality, 1-, 5-, and 10-year survival rates were 88.8%, 78.7%, 68.5%, and 58.4%, respectively. Survival rates after replacement and repair demonstrated no significant differences (P = .52). The ejection fraction improved from 29.1 ± 6.6% to 38.22 ± 6.8% at follow-up (P < .02). Freedom from valve associated complication was 100%. Freedom for readmission for heart failure was 72.5%.

Conclusions: Mitral valve surgery in patients with severe left ventricular function can be performed with good clinical results and should be always considered as treatment option for selected patients in drug refractory heart failure and restricted indication for heart transplantation even in patients with the need of valve replacement.

PE65—AORTIC VALVE REPLACEMENT IN PATIENTS WITH SMALL AORTIC ANNULUS

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Objectives: Although aortic valve replacement (AVR) is an effective treatment for patients (pts) with aortic valvular disease, the implantation of a small aortic prosthesis (19 mm or 21 mm) may result in residual left ventricular outflow stenosis and transvalvular gradient. In this study, the initial clinical outcome and long-term period of patients treated with a small aortic prosthesis was analyzed retrospectively and compared to the overall outcome of patients with aortic valve replacement.

Methods: Two hundred thirty-five pts (210 female, 25 male, 76 ± 12.1 years; logES 14.8 ± 4) underwent aortic valve replacement with 21-mm or 19-mm aortic valve prosthesis. The mortality rate and follow-up were compared to overall outcome of 1948 pts (850 female, 1096 male, 69 ± 10.2; logES 5.6 ± 6.0) years who received aortic valve replacement in the same time period.

Results: Hospital mortality in pts with small aortic annulus was 6.8% (n = 16) compared to 2.3% (n = 45); *P* = .034 in the general aortic valve population. During follow-up (mean follow-up 47 ± 29.2 months) further 61 pts of patients with small aortic annulus aortic died (5-year survival 67.3%). Overall follow up (52 ± 4 months) resulted in 5 year survival of 86.1%; *P* = .0002.

Conclusions: Aortic valve replacement in pts with small aortic annulus can be performed with good clinical results, although substantial mortality compared to overall aortic valve patient population with concern of early and late clinical results.

PE66—SURGICAL TREATMENT OF ISOLATED MITRAL VALVE DISEASE COMPLICATED WITH MASSIVE THROMBOSES OF LEFT ATRIUM

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Objective: To analyzed main problems in surgery of mitral valve diseases (MVD) complicated by left atrium's massive thromboses (LAMT) (thromboses more than 1/3 of left atrium's volume).

Materials and Methods: 239 adult patients (pts) with MVD complicated LAMT were consecutive operated from 01 Jan. 1984 till 01 Jan. 2010 in Institute. Mitral stenoses was marked in all pts and all of them were in IV NYHA class. There were 120 males (50.2%) and 119 females (49.8%) in average age 52.2 ± 7.5 years. Calcification of MV was in 167 (69.9%) patients. Previous episodes of emboli were in 49 (20.5%) patients. Following procedures were performed: mitral valve replacement (MVR) (n = 201) including plastic procedure on TV by De Vega (n = 29); open mitral commissurotomy (OMC) (n =38) including plastic procedure on TV (n = 6).

Results: The hospital mortality (HM) (1994-2009) was 3.6% (n = 5/138) for MVR (including TV's correction) and 0% (n = 0/27) for OMC. The reasons of deaths were: heart failure (n = 2), brain damage (thromemboli) (n = 2), bleeding (traumatic rupture of LA's posterior wall during removing of LAMT) (n = 1). In all group traumatic rupture of LA's wall during radical removing of LAMT was marked in 1.7% (n = 4/239) pts. Thrombotic events were marked in 5.9% (n = 12/201) during MVR and 2.6% (n = 1/38) during OMC (*P* < .05). HM depends of following factors: small LV's volume (ESVI < 15 mL/m.q.), systolic pressure in pulmonary artery > 90 mmHg, giant LA, calcification of MV + 3. At the remote period (average 14.2 ± 3.8 years) mortality in three time and thrombotic lethal events in two times were higher for MVR's group (n = 165) than in OMC's group (n = 33) (*P* < .05).

Conclusion: Correction of MVD with LAMT should be done without MVR as soon as possible.

PE67—REDUCTION OF LEFT ATRIUM DURING ISOLATED MITRAL VALVE REPLACEMENT

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Aim: To determined possibilities of left atrium (LA)'s reduction by paraannular plasty of posterior wall of LA (PPPWLA) during mitral valve replacement (MVR) for isolated mitral valve disease (MVD).

Methods: During 1 Jan 1996 to 1 Jan 2010, 283 adult patients (pts) were operated with MVD and giant LA (≥60 mm). There were 123 (43.5%) males, 160 (56.5%) females. Average age was 52.1 ± 7.1 years. 231 (81.7%) patients were in IY NYHA class and 52 (18.3%) in III. MVR + PPPWLA including ligation of LA's auriculum was performed in 204 (72.1%) patients (group A) and isolated MVR in other 79 (27.9%) patients (group B).

Results: At the group A hospital mortality (HM) was 1.9%. At the remote period (7.3 ± 0.9 years) 183 (91.5%) patients were followed-up. Sinus rhythm was preserved at 57 (31.1%) patients. Data of echo for group A: diameter of LA (mm) preoperative (PRE) 62.1 ± 4.2, postoperative (POST) 46.4 ± 2.8, remote period (RP)-47.1 ± 2.2; ejection fraction of LV (EFLV): PRE 0.53 ± 0.04, POST 0.56 ± 0.03, RP 0.58 ± 0.03; end-systolic volume index (ESVI) (mL/m.sq.): PRE 67.4 ± 8.2, POST 56.2 ± 4.8 , RP 46.5 ± 6.1.

HM in group B was 2.5%. Seventy-one (93.4%) patients were followed-up. Sinus rhythm wasn't preserved in any patients. Data of echo for group B: diameter of LA: PRE 65.5 ± 5.8, POST 62.9 ± 5.7 , RP 70.8 ± 3.6; EFLV: PRE 0.53 ± 0.03 , POST 0.52 ± 0.04, RP 0.46 ± 0.04; ESVI: PRE 69.7 ± 7.2, POST 61.2 ± 5.3 , RP 58.4 ± 5.7. At the remote period unsatisfactory results were determined by progressive HF (n = 9), thromboembolic complications (n = 5). There were 5 deaths: progressive HF (n = 3), thromboembolic stroke (n = 2).

Conclusion: PPPWLA during MVR improves LA's morphometry and LV's contractility. We recommend it case of LA's significant dilatation.

PE68—GIANT HEART TUMOUR

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Introduction: An 81-year-old male patient was admitted to our hospital with a questionable tumour in the left atrium.

Background: Over the last 5 months the patient had lost 25 kg of weight. Atrial fibrillation and benign prostatic hyperplasia were previously diagnosed. The transthoracic echocardiography performed in an external hospital showed a tumour in the left atrium. Therefore, the diagnosis of myxoma was suspected. To rule out other malignancies computed tomography of the abdomen, skull, chest and all lymph nodes was performed. The investigations showed no significant pathologies.

In the cardiac computed tomography performed in our hospital a giant tumour occluding the left atrium (18 cm x 16 cm x 6 cm diameter) was observed. The superior vena cava was not presentable. The investigation showed different tissue densities with signs of chalk deposition in the tumour. To further classify the dignity of the tumour PET-CT was performed. This showed various areas of enhancement. Therefor, the diagnosis of a malignant tumour was suspected.

Discussion: Intraoperatively a giant tumour filling the left atrium and infiltrating the superior vena cava could be observed. The superior vena cava and the upper lope of the lung were completely occluded by the tumour. After resecting the tumour the atrium was reconstructed using a bovine pericard patch. The intraoperative investigation of the tumour revealed the diagnosis of a high-malignant pleomorph and spindel cell sarcoma (G3). The diagnosis was confirmed by the department of pathology.

PE69—RECONSTRUCTION OF AORTA`S OSTIUM DURING AORTIC VALVE REPLACEMENT: NEW SOLUTION OF PROBLEM

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Purpose of this investigation is research of possibilities of reconstruction of aorta's ostium (RAO) during aortic valve replacement (AVR) in patents (pts) with narrow aorta's ostium.

Materials and Methods: In analyzed group were included 33 pts with aortic (n = 26) and combined mitral-aortic diseases (n =7) with narrow aorta's ostium who were operated in Institute from 01 May 2009 to 21 Jan 2011. There were 15 males and 18 females. In average age 58.7 ± 6.3 years. Five (15.1%) pts belonged to III NYHA class, 28 (84.9%) to IV. Body surface area (BSA) was 1.87 ± 0.35 cm². AVR with RRAA was performed in all cases after original methodic in which aorta's incision was made in the middle of non-coronary leaflet, and then into central fibrous body of right trigone on depth 7-9 mm. Aorta's segment in non-coronary leaflet was dissected in width of 1 cm. Patch 4 x 6 cm was replaced at the basement of noncoronary sinus and ascending aorta without any connection of mitral valve. Bileaflet prosthesis (Carbomedics, Saint Jude Medical, On-X) were used in sizes: 21 mm (4 pts), 23 mm (19 pts), 25mm (8 pts), 27 mm (2 pts).

Results: Nobody died during hospital period (30 days). There were no remarks to surgical correction. Inotropic support during early postoperative period was within 2 mcgr/min/kg. Duration of staying on artificial lung ventilation was 9.4 ± 2.1hours, in intensive care unit 76.5 ± 9.1 hours. Patients were discharged in average on 13-15 days without clinically significant complications. Peak systolic gradient on outlet of left ventricle was before operation 108.1 ± 16.3 mmHg, on a aortic prosthesis at discharge 23.1 ± 4.3 mmHg.

Conclusion: Reconstruction of narrow aorta's ostium during AVR by proposed method of posterior aortoplasty is highly effective intervention.

PE70—AORTIC VALVE REPLACEMENT: RESULTS AND PREDICTORS OF MORTALITY FROM A CONTEMPORARY SERIES OF 2837 PATIENTS

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Background: Although aortic valve replacement (AVR) is an effective treatment for patients (pts) with aortic valvular disease, substantial hospital mortality remains. The study's objectives were to evaluate results and identify predictors and prognostic variables of hospital mortality after isolated aortic valve replacement and analyze mid-term survival

Patients: Data from 2837 patients (1573 male, 1264 female; 69.6 ± 10.36 years) undergoing primary isolated aortic valve replacement between January 2000 and December 2009 were retrospectively collected and analyzed to estimate hospital mortality and identify predictors and prognostic variables.

Results: Overall hospital mortality was 2.8%. By multivariate analysis, age > 80 years (P = .04), pulmonary artery pressure greater than 60 mmHg (P = .01), NYHA > = III (P = .002) and preoperative dialysis (P = .02) emerged as independent predictors of hospital mortality. Concerning intra- and postoperative variables only postoperative dialysis was identified as independent predictor (P = .0001).

Conclusions: AVR results in excellent clinical results. Mortality risk seems to be particularly associated with preoperative risk constellations indicating prolonged heart failure.

PE72—ASYMPTOMATIC SUPERIOR MEDIASTINAL TUMOUR EXCISION IN A PATIENT UNDERGOING CORONARY ARTERY BYPASS SURGERY

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Objective: Simultaneous cardiac and mediastinal surgical interventions are still a matter of debate because of increase mortality and morbidity it carries with it. We report a case of a 51-year-old female who presented with severe coronary artery disease with unstable angina associated with an incidental large superior mediastinal tumour of unknown origin which was inconclusive on preoperative CT scan.

Method: Patient had a recent onset of chest pains associated with hypertension, hypercholesterolemia and diabetes mellitus. Coronary angiogram revealed severe triple vessel disease. Preoperative chest x-ray showed a superior mediastinal shadow and CT-scan revealed a large heterogeneous tumour compressing and pushing the arch vessels and arch of the aorta posteriorly and brachiocephalic veins and SVC anteriorly with mild mass effect on the trachea. The differential diagnosis was Lymhoma or Thymic malignancy and was suggested for FNAC before operation to determine the nature of tumor. But due to severe ischemia FNAC was not done and proceeded for surgery along with lymph node biopsy.

Result: The tumor was covering the aorta .Combined excision of tumor (11x 8 x 6 cm) with lymph node followed by CABG x 4 using LIMA, radial and vein conduits were performed. The duration of the operation from skin to skin was 270 min; perfusion time for CABG was 90 min, ischemic time 50 min. The length of hospital-stay was 9 days. The postoperative course was uneventful on the eight day histopathology showed retrosternal multinodular goiter with normal lymph nodes. Subsequent thyroid function test done was normal.

Conclusion: Our review of literature suggested that combined mediastinal and cardiac procedures are safe ,less time consuming, acceptable and avoids a two-staged procedure. Our case study confirms the same.

PE73—TREATMENT OF GRAM-POSITIVE DEEP STERNAL WOUND INFECTIONS IN CARDIAC SURGERY—EXPERIENCES WITH DAPTOMYCIN

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Objective: The reported incidence of deep sternal wound infection (DSWI) after cardiac surgery is 0.4-5% with Staphylococcus aureus being the most common pathogen isolated from infected wound sternotomies and bacteraemic blood cultures. This infection is associated with a higher morbidity and mortality than other is known aetiologies. Little is reported about the optimal antibiotic management. The aim of the study is to quantify the application of daptomycin treatment of DSWI due to gram-positive organisms post cardiac surgery.

Methods: We performed an observational analysis in 23 cases of post sternotomy DSWI with gram-positive organisms February 2009 and September 2010. When the wound appeared viable and the microbiological cultures were negative, the technique of chest closure was individualised to the patient.

Results: The incidence of DSWI was 1.46%. The mean dose of daptomycin application was 4.4 ± 0.9 mg/kg/d and the average duration of the daptomycin application was 14.47 ± 7.33 days. In more than 50% of the patients VAC therapy was used. The duration from daptomycin application to sternal closure was 18 ± 13.9 days. The parameters of infection including, fibrinogen (P = .03), white blood cell count (P = .001), and C-reactive protein (P = .0001) were significantly reduced after daptomycin application. We had no mortality and wound healing was successfully achieved in all patients.

Conclusions: Treatment of DSWI due to gram-positive organisms with a daptomycin-containing antibiotic regimen is safe, effective and promotes immediate improvement of local wound conditions.Based on these observations, daptomycin may offer a new treatment option for expediting surgical management of DSWI after cardiac surgery.

PE74—BILATERAL LOWER LOBE LUNG TRANSPLANTATION—AN ALTERNATIVE TECHNIQUE FOR SMALL PATIENTS—A CASE REPORT

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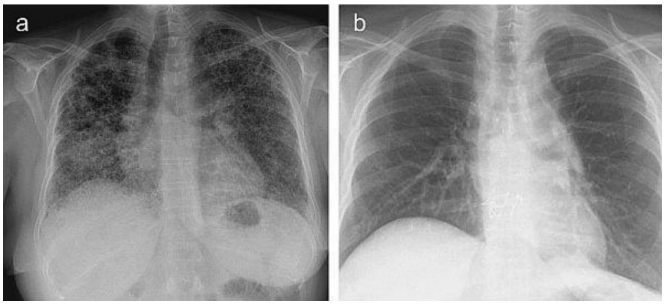
Introduction: We report on a 41-year-old female patient with global respiratory failure who underwent bilateral lower lobe transplantation.

Aims: This patient (calculated TLC 4.9 L) was placed on the high urgency waiting list for lung transplantation with terminal respiratory failure from pulmonary fibrosis. Her forced vital capacity (FVC) and forced expiratory volume in one second (FEV1) were only 0.81 L and 0.76 L, respectively. Due to her small body size (1.60 m) and rapidly deteriorating condition, it was not possible to get a size-matched donor organ in time. Considerably bigger donor lungs were accepted (TLC 8.0 L) and bilateral lower lobe transplantation was performed through a bilateral thoracosternotomy using cardiopulmonary bypass. Excellent size match was observed after blood circulation and inflation. The patient recovered quickly from surgery. After 7 days, she was ambulatory and free from oxygen support. The patient was discharged from hospital after 2 weeks in excellent respiratory condition. At 1 month follow-up, her FVC and FEV1 were 1.94 L and 1.46 L, respectively. (Figure: a - pre LTX, b - post LTX)

Conclusion: Lobar lung transplantation can safely be performed for smaller recipients, especially those with extremely small thoracic cavities due to restrictive pulmonary disease.



[Chest X-ray pre and post LLTX]

PE75—RETROSPECTIVE ANALYSIS OF EPIMYOCARDIAL LEAD PERFORMANCE IN CARDIAC RESYNCHRONIZATION THERAPY

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Objectives: Epimyocardial left ventricular lead implantation via lateral minithoracotomy represents an alternative approach in case of failing transvenous lead positioning or coronary sinus lead dysfunction. The aim of the study was to characterize the impact of underlying etiology of cardiomyopathy on midterm epimyocardial lead performance in patients with indication for cardiac resynchronization therapy (CRT).

Methods: Twenty-three consecutive patients (age: 63 ± 11 years) were selected between Jan 2006 and Dec 2008. Groups were divided into DCM (14) versus ICM (9) with regard to gender. Implantation and follow up thresholds were standardized (V/0.5 ms). Follow up data were collected from 1 through 32 months (12 months ± 9.3) time. Statistical analysis were performed using Student's T-Test and Wilcoxon-Rank Test.

Results: Summary of impedance and thresholds are depicted in table 1. Impedance did not change throughout observational period whereas the collected thresholds increased significantly. ICM patients presented a markedly higher increase (Delta: 0.7 V/0.5 versus 1.2 V/0.5 ms, *P* = .17) in threshold values compared to DCM patients.

Table 1

	Baseline (Ω)	Follow up (Ω)	P – Value
Impedance ALL	548 ± 43	498 ± 38	0.18
Impedance DCM	490 ± 119	487 ± 157	0.9
Impedance ICM	638 ± 280	516 ± 231	0.15
	Baseline (V/ 0.5 ms)	**Follow up (V/ 0.5 ms)**	**p – Value**
Threshold ALL	1.5 ± 1	2.4 ± 1.1	<0.001
Threshold DCM	1.6 ± 1	2.3 ± 1.2	0.002
Threshold ICM	1.3 ± 1	2.5 ± 1.1	0.004

Conclusions: Epicardial leads offer an alternative to transvenous lead positioning. We detected a trend towards an increased deterioration of the stimulation results after 1-year of follow-up particularly in patients with ICM compared to DCM. Long-term evaluation trials are in need.

PE76—TRANSCRANIAL DOPPLER SOUND DETECTION OF CEREBRAL MICROEMBOLISM DURING TRANSCATHETER AORTIC VALVE IMPLANTATION

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Objective: Transcatheter aortic valve implantation is a new method for the treatment of high-risk patients. Nevertheless, this new procedure carries potential risks. Increased downstream microembolization is expected. However, whether it does usually occur, in which frequency and its clinical relevance are not known. We report the results of ultrasound microembolic signal detection in the middle cerebral artery during the procedure.

Methods: Three hundred fifty patients (mean age, 79 ± 8 years; mean EuroSCORE, 38 ± 20%) underwent transapical aortic valve implantation. Intraoperative transcranial Doppler (TCD) sound examination of both middle cerebral arteries (MCA) was used to identify high-intensity transient signals (HITS) and microembolic signals (MES) during seven phases of the procedure. Clinical neurological examinations were performed preoperatively and daily during the first postoperative week and, additionally, pre- and postoperative computed tomography of the brain.

Results: During the procedure, HITS (right MCA, 435 ± 922 [range 9-5765[; left MCA 471 ± 996 [range 24-6432]) and MES (right MCA: 78 ± 172 [range 1-955]; left MCA: 62 ± 190 [range 2-1553]) were detected in all patients. Most of the MES were recorded during valvuloplasty (right MCA: 3 ± 5.6 [range 0-31]; left MCA: 2 ± 4.9 [range 0-30]) and positioning of the prosthetic valve in the aortic position (right MCA: 6 ± 5 [range 0-22]; left MCA: 2 ± 6.9 [range 0-38]). Postoperatively, there were no clinical signs of new cerebral embolism.

Conclusions: Cerebral microemboli were detected by intraoperative transcranial Doppler sound examinations in all patients during transapical aortic valve implantation. Most of the signals were detected during balloon valvuloplasty and delivery of the prosthetic valve.

PE77—EPITHELIAL TO MESENCHYMAL TRANSITION IN HUMAN AMNION EPITHELIAL CELLS

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Objective: Amnion epithelial cells (AEC) are a readily available cell source for potential use in regenerative medicine. Subpopulations of AEC may express embryonic stem cell markers such as SSEA-3/4, TRA1-60, TRA1-81, *OCT-3/4*, *NANOG*, *SOX-2* and display stem cell behaviour. In this study, we sought to induce epithelial-to-mesenchymal transition (EMT) in AEC to improve their capacity for cardiovascular regeneration.

Methods: AEC's were derived from full-term placenta. To induce EMT, transforming growth factor-β (TGF-β) was added to the cell culture medium. Induced and non-induced cells were stained with mouse anti-human N-cadherin. A transwell migration assay was performed in a 24-well format using 8μm pore size

transwell inserts. FACS analysis was performed using a BD FACS Calibur and Microarray analysis using Affymetrix HG-U133A chip. Furthermore, the in vivo effects of the EMT were assessed in a mouse model of myocardial infarction by ligating the LAD. This study is currently in progress.

Results: AEC expressed stem cell markers but lost Oct-4 expression at higher passages and behaved like mature epithelial cells. 25ng/mL TGF-β added to the medium for 5-6 days induced significant changes in AEC morphology. Cells acquired elongated-fibroblastoid shape, resembling mesenchymal cells. Upon EMT, AEC showed up-regulation of N-cadherin. Furthermore, irregular migration pattern led to accelerated wound closure and only stimulated AEC migrated through the 8μm transwell membrane. FACS analysis showed an increase in CD 90 expression and a decrease in CD14 and HLA-DR expression. Gene expression profiling based on microarray analysis revealed a difference in gene expression in particular with the down regulation of the epithelial markers.

Conclusion: We conclude that under the influence of TGF-β, mature AEC undergo EMT and acquire a mesenchymal cell-like phenotype. EMT greatly enhances cell mobility and may thus help optimize AEC for use in cardiovascular cell therapy.

PE78—EARLY POST CORONARY ARTERY BYPASS GRAFTING PLATELET HYPERACTIVITY, ASSESSED BY WHOLE BLOOD IMPEDANCE AGGREGOMETRY, INDICATES DUAL ANTIPLATELET THERAPY

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Objectives: Reactive platelet hyperactivity following coronary artery bypass grafting (CABG) might be related to thrombotic complications and major ischemic cardiac events. The aim of this study was to evaluate the changes in platelet reactivity, monitored pre- and postoperatively using whole blood impedance aggregometry (MEA).

Methods: One hundred patients undergoing elective CABG were enrolled in the study. The blood samples were drawn day before surgery, first and forth postoperative day (POD). Platelet count and fibrinogen level were documented, as well as type and daily dose of antiplatelet drugs, received pre- and postoperatively. MEA using ASPI and ADP test was performed day before and 4 days after surgery.

Results: All patients received 100 mg acetylsalicylic acid (ASA) preoperatively, and 47% of patients received additionally clopidogrel 75 mg (CLO). There was 32% ASA no responders (ASPI > 30 AUC) preoperatively. Postoperatively all patients received 300mg ASA, and we registered 46% no responders at higher dose of antiplatelet therapy, suggesting platelet hyperactivity. Comparing ASPI values pre- and postoperatively (POD 4) we have found higher values postoperatively despite ASA 300 mg administered postoperatively. Thus, subgroup of patients with ASPI >30 AUC registered postoperatively, received additionally CLO 75 mg daily in terms of platelet inhibition optimization.

Conclusions: MEA can recognize patients with temporary ASA resistance during the post CABG period. ASA 300 mg, administered postoperatively, did not sufficiently inhibit platelet aggregation in 46% post CABG patients. In this subgroup of patients with early post-CABG platelet hyperactivity dual antiplatelet therapy with ASA and CLO (DAT) could be useful for maintaining graft patency, and preventing adverse ischemic events. Alternatively, temporary administration of higher ASA dose (>300 mg) as a monotherapy would not be prudent on the basis of potentially adverse effects of higher doses of ASA on the production of the vasodilator prostacyclin (PGI 2).

PE79—ETIOLOGICAL REPAIR FOR BARLOW DISEASE

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Recent advances in mitral valve repair allow the etiological correction of myxomatous mitral valve. We presented our surgical experience using Myxo-ETlogix ring.

From January 2008 to February 2011, 45 patients (mean age 59 ± 7 years) affected of Barlow disease underwent primary mitral valve repair using Myxo-ETlogix ring. Moderate quadrangular resection and minimal sliding annuloplasty was performed in 25 patients with chordal rupture in remaining 20 patients was used only plication of posterior annulus, while in all 45 patients Myxo-ETlogix ring was implanted. Mean ring size was 32mm.

There was no hospital mortality. At follow up no patient had 2+ or grater mitral regurgitation and chordal systolic anterior motion was observed in 2 patients.

In our experience surgical repair of Barlow disease with Myxo-ETlogix ring significantly reduced mitral regurgitation and in patients without chordal rupture there is no need for sliding annuloplasty.

PE80—COMPARISON OF THE GRAFTS PATENCY AFTER STANDARD CABG VERSUS MICRO-SURGICAL TECHNIQUE

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Graft patency is a fundamental predictor of long term survival after coronary bypass surgery. Arterial graft patency has been shown to be superior to that of saphenous vein grafts. The surgeons who use the microsurgical technique believe that in performing coronary anastomoses same aspects avoid the occlusive change at the coronary artery bypass graft anastomosis. The purpose of this study was to evaluate the graft patency rate with standard bypass compare with the results of bypass with microsurgical technique.

We reviewed all the coronary angiography procedures at our institution from 2000 to 2009 and we selected the patients after a primary isolated coronary artery bypass operation. They were divided in 2 group Standard (n = 239) had conventional bypass and group micro (n = 149) had bypass with microsurgical technique.

At 5 years the graft patency was 81% of left mammary in group standard and 90% in group micro. Patency of right mammary

was 58% in group standard and 75% in micro . Patency of vein was 38% in group standard and 81% in micro ($P \leq .05$). Patency of radial was 50% in group standard.

Angiography in our study showing a better midterm graft patency rate in patients receiving a primary bypass with microsurgical technique. The microsurgical technique play an important role in the reduction the vein failure, provides midterm high patency rates for vein grafts and is comparable to patency rate of the left mammary graft of standard group.

PE81—OFF-PUMP MYOCARDIAL REVASCULARIZATION WITH INTRACORONARY SHUNT IN THE ELDERLY

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Objective: To analyze the in-hospital outcome of elderly patients aged 70 years and older who were operated on, using the beating heart coronary artery bypass grafting with an intraluminal shunt, in urgent, emergent and elective coronary revascularizations.

Methods: We analysed prospectively 87 patients aged 70 to 92 years old. In the whole group, 50 (57.5%) patients had unstable angina, with 3 (3.4%) acute myocardial infarction. Thirty-one (35.6%) patients underwent urgent and emergent surgery. Thirteen (14.9%) patients had myocardial infarction in less than 30 days and 34 (39.1%) in more than 30 days.

Results: The main postoperative complications were: atrial fibrillation (32.2%), heart failure (12.6%), pneumonia (10.3%), septicemia (3.4%), acute myocardial infarction (2.3%), mediastinitis (1.1%), transient ischemic attack (1.1%), and pneumothorax (1.1%). The mean extubation time was 18.50 ± 19.09 hours, the intensive care unit stay was 2.92 ± 2.03 days, and hospital stay was 10.55 ± 7.16 days. Nine (10.34%) patients received blood transfusion with no reoperation for bleeding. The in-hospital mortality was 4.6%.

Conclusions: In 70 year old and over patients, elective and non-elective off-pump coronary artery bypass grafting with intracoronary shunt showed to be safe and effective, associated with low rates of postoperative complications and mortality in relation to the studied population.

PE82—OFF-PUMP WITH INTRACORONARY SHUNT VERSUS ON-PUMP CORONARY ARTERY REVASCULARIZATION: EFFECTS ON PULMONARY FUNCTION

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Objective: Many studies have shown important changes in lung function tests after coronary artery surgeries. It is controversial if off-pump surgery can give a better and shorter recovery than the on-pump.

Methods: A prospective study was conducted on 42 patients submitted to coronary artery surgery and divided into two groups: 21 off-pump using intraluminal shunt (GI) and 21 on-pump (GII), matched by the anatomical location of the coronary arteries lesions. All patients had spirometric evaluation, blood gas measurements and alveolo-arterial oxygen gradient (A- aDO2), at the fourth and 10th postoperative days (PO4 and PO10).

Results: Preoperatively, GI and GII had similar results ($P = .372$). Spirometry showed decreases at PO4 and remained decreased until PO10 for both groups, with significant differences between the groups. The blood gas measurements showed reduction in arterial oxygen pressure (PaO2) and carbon dioxide pressure (PaCO2), while there was an increase in A-aDO2 at PO4 and PO10 in both groups. The results suggest that different changes occur in pulmonary function when the surgery is performed with or without cardiopulmonary bypass.

Conclusions: The off-pump patients showed significantly greater improvement than the on-pump group.

PE83—CORONARY ARTERY BYPASS GRAFTING ALONE AND COMBINED WITH SURGICAL VENTRICULAR RECONSTRUCTION FOR ISCHEMIC HEART FAILURE

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Objective: To compare the results of the coronary artery bypass grafting (CABG) alone and combined with surgical ventricular reconstruction (SVR) in patients with ischemic heart failure.

Methods: In this study we included 236 patients with ischemic heart failure who underwent surgical treatment. There were 217 men and 19 women, with a mean age 56 ± 8, whom had prior one or more myocardium infarction, with 3-4 NYHA functional class, and EF less then 35%. Patients were blindly randomized in two groups. There were 116 patients who underwent CABG with SVR and in 120 patients was performed CABG alone. With echocardiography study we estimated left ventricular and mitral valve dysfunction before and after surgery. There was no difference in preoperative status in patients of both groups.

Results: The hospital mortality rate was 5.8% after isolated CABG and 3.5% after CABG combined with SVR. All surviving patients had postoperative study from 1 month to 3 year. The mean NYHA functional class decreased from 3.1 ± 0.7 to 2.1 ± 0.6 one year after CABG and from 3.2 ± 0.5 to 2.0 ± 0.4 one year after CABG with SVR. We revealed that left ventricular reconstruction significantly decreased EDV from 241 ± 64 to 166 ± 36 and increased EF from 30 ± 6 to 38 ± 4 accordantly. However after isolated CABG EF did not increase significantly (31 ± 5 and 33 ± 7 respectively). One- and three-year survival rate was 95% and 78% after CABG with SVR and 83% and 78% after CABG alone.

Conclusions: Despite on the more aggressive surgical strategy left ventricular reconstruction did not increase operative mortality and early results were significantly effective compare with coronary artery bypass grafting alone.

PE84—SCUBA DIVING INFLUENCE ON PACEMAKERS

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Introduction and Aims: Pacemaker functions can be generally altered by electromagnetic fields, ionizing radiation, and acoustic radiation. Each year 500,000 pacemakers are implanted and 125,000 (25%) are adult/young adult patients. Many of these patients are regular sport practitioner, however the scuba diving influence on pacemaker was never evaluated. The aim of this study is to verify scuba diving pressure influence on pacemaker functions.

Method: Nine pacemakers were submitted to 3 diving at 15 m, 3 diving at 30 m, 1 diving at 45 m, 6 diving at 60 m, and 3 diving at 80 m (2.5, 4.0, 5.5, 7.0, and 8.0 atmosphere pressure respectively). Magnet rate, sensor indicated rate and pulse amplitude (ventricular and atrial) and battery data (voltage, current, and impedance) were analyzed before and after each diving.

Results: After 114 diving we found 102 parameter alterations (89%) as shown on Table 1 [(-): no alteration found; (+): alteration found].

Table 1:Type of parameter alterations among depths

Depth (m)	Diving with alteration (%)	Magnet Rate	Sensor indicated rate	Ventricular pulse amplitude	Atrial pulse amplitude	Voltage	Current	Impedance
15	27 (100)	-	+	+	+	-	+	+
30	18 (67)	-	+	-	+	-	+	+
45	6 (67)	+	-	-	-	-	-	+
60	39 (100)	+	+	+	-	-	+	+
80	12 (100)	-	+	+	+	-	+	+
Total	102 (89)	+	+	-	-	-	-	+

Despite the greatest variation was about 15% (impedance at 60m) those absolute alterations were quite small as shown on Table 2.

Table 2:Parameters before and after scuba diving

Depth (m)	Magnet rate (ppm)	Sensor indicated rate (ppm)	Ventricular pulse amplitude (V)	Atrail pulse amplitude (V)	Voltage (V)	Current (μA)	Impedance (k)
	Before / After	Before / After	Before / After	Before / After	Before / After	Before / After	Before / After
15	98.8 / 98.8	102.8 / 106.3	4.1 / 4.2	3.8 / 3.7	2.77 / 2.77	7.3 / 8.0	1.2 / 1.1
30	98.8 / 98.8	106.1 / 104.3	4.2 / 4.2	3.7 / 3.8	2.77 / 2.77	8.0 / 7.8	1.1 / 1.2
45	98.8 / 98.5	106.3 / 106.3	4.2 / 4.2	3.8 / 3.8	2.77 / 2.77	7.8 / 7.8	1.2 / 1.3
60	98.7 / 98.9	111.7 / 116.7	4.2 / 4.1	3.8 / 3.8	2.77 / 2.77	7.2 / 7.1	1.3 / 1.1
80	99.1 / 99.1	102.5 / 96.3	4.1 / 4.0	3.5 / 3.6	2.77 / 2.77	5.4 / 5.2	1.2 / 1.2

Conclusions:

1. Scuba diving altered most of pacemaker functions, but these alterations are very small,
2. impedance was altered at all depth, and
3. voltage was not altered at any depth.

PE86—SINGLE OR DOUBLE TRANEXAMIC ACID DOSE TO MINIMIZE FIBRINOLYSIS AND INFLAMMATORY RESPONSE AFTER OPEN HEART SURGERY? A RANDOMIZED DOUBLE-BLIND PHASE IV CLINICAL TRIAL

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Objectives: Fibrinolysis inhibitors can reduce postoperative inflammatory response because having commons mediators. Our aim is to study if to add a second tranexamic acid (TA) dose after CPB discontinuation is better than only one to minimize fibrinolysis and inflammatory response (FIR) after open heart surgery.

Material and Methods: A dose dependent double blind randomized study was drawn to analyse 160 CPB patients receiving TA. They were randomly assigned to either the 80 patients single-dose group (40 mg/kg TA before CPB and placebo after that) or the remaining 80 double-dose group (40 mg/kg TA before and after CPB). From 209 patients assessed for eligibility, 49 were excluded. According with a previous study, the incidence of FIR in the TA group was 16.6%, and then the sample size calculated was 58 patients per group. There were not statistical differences among demographic variables, comorbitity, ACEI presurgery treatment, surgery risk-score, body-mass index, surgery performed, preoperative parameters and surgical data -blood salvage included. Pearson's X^2 or Fisher's exact test to compare categorical variables and Student's t-test or Mann-Whitney test when were continuous and Mixed ANOVA to compare means between groups, were used.

Results: FIR was higher in the single-dose group (18.8% versus 7.5% in double-dose group; $P = .035$), as well as the postoperative bleeding ($P = .0014$) and D-Dimer levels ($P = .038$). No relation-ships were found between groups and adverse postoperative events (seizures, 0 versus 2; strokes, 1 versus 2; acute renal dysfunction, 6 versus 7; dialysis needed, 4 versus 3; myocardial infarction, 2 versus 1; surgery-related bleeding re-interventions, 3 versus 2; or hospital mortality, 3 versus 6, cases).

Conclusions: An additional dose of TA finishing CPB gives a prolonged inhibition of fibrinolysis and may further decrease the risk of inflammatory response after open heart surgery in a safety way.

PE87—COMPARISON OF ON-PUMP AND OFF-PUMP CORONARY BYPASS SURGERY REGARDING DEVELOPMENT OF POSTOPERATIVE ATRIAL FIBRILLATION

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Objective: Postoperative atrial fibrillation (AF) is still frequent complication after cardiac surgery in spite of the improvements in the surgical procedures. There is still controversy whether or not, the absence of cardiopulmonary bypass results in a lower incidence of AF.

Methods: Four hundred forty-nine patients that underwent elective CABG were included in this prospective study and the patients were divided in two groups.

Group I included 86 patients who underwent revascularization without cardiopulmonary bypass, and group II consisted of 363 patients who underwent revascularization with cardiopulmonary bypass.

Then, the incidence of AF and some perioperative factors of patients in two groups were determined and compared with each other.

Results: The incidence of postoperative AF was determined as 21.4% after on-pump and 3.4% after off-pump revascularization. Avoiding cardiopulmonary bypass decreased the incidence of postoperative AF.

Conclusion: There is reduction of AF rate in myocardial revascularization without cardiopulmonary bypass. Our study suggests that beating heart procedure is benefit in the prevention of AF after cardiac surgery.

PE88—A PROSPECTIVE STUDY TO ANALYSE PREOPERATIVE AND POSTOPERATIVE PULMONARY HYPERTENSION FOLLOWING MITRAL VALVE REPLACEMENT FOR MITRAL VALVULAR HEART DISEASE

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Objective: To analyze preoperative and postoperative pulmonary hypertension following mitral valve replacement for mitral valvular heart disease and to study the impact of surgery during postoperative follow up .

Methods: A total of 265 patients including male and female patients were studied in a prospective manner from July 2007 to July 2009 in our Rajiv Gandhi Government General Hospital. All patients were admitted with NYHA class II-IV Symptoms and had Pulmonary Hypertension following Mitral stenosis OR Mitral Regurgitation.

All patients were consented before the study and investigated preoperatively with ECHOCARDIOGRAM. Any other combined valvular lesions were not taken for the study. All the patients were operated using cardiopulmonary bypass under same operating conditions. All patients were recorded of their pulmonary pressures before and after weaning from the bypass machine directly on cannulating the pulmonary artery. All of them underwent mitral valve replacement using St. Jude's mechanical prosthetic valve. All the patients were classified according to their age, sex, diagnosis, preoperative, intraoperative, and postoperative echocardiogram findings. The tabulated informations were statistically analyzed using chi-square test and T-test. All the patients were followed up using echocardiogram during their 3months and 6 months follow up and analyzed.

Results: 195 out of 265 patients had severe pulmonary hypertension and the rest had mild to moderate pulmonary hypertension. Female patients outnumbered their male counterparts 111/195 (56.9%). About 21% of patients showed immediate reduction in pulmonary hypertension and approximately about 79% showed regression in pulmonary hypertension after about 6 months period during the follow up. About 14 deaths (7.07%) were noted in the study which happened immediately following the operation and happened with patients having severe pulmonary hypertension. The mean fall in Pulmonary Artery pressure was approximately 45%.

Conclusion: Mitral valve replacement is a safe procedure in the presence of severe pulmonary hypertension. Due to multifactorial reasons the decline in pulmonary artery hypertension takes place only gradually rather than immediately.

PE89—SINGLE VENOUS CANNULATION FOR OPEN RIGHT HEART SURGERY WITHOUT SNARES

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Objective: Traditionally, open right heart surgery is realized with dual venous cannulation and snared caval veins for total cardiopulmonary bypass. This technique does not always provide satisfactory pump flow due to, among others, problems with cannula positioning which may change during the procedure. We have previously reported a technique for open right heart surgery using one venous cannula with a snare in the superior vena cava, and one venous cannula without a snare in the inferior vena cava. The present study was designed to asses remote single venous cannulation for open right heart surgery without snares.

Methods: Cardio-pulmonary bypass was established in a series bovine experiments (body weight 63 ± 10 kg) with remote venous cannulation by the means of one long self-expanding cannula in trans-jugular fashion. This technique has been previously reported and termed temporary caval stenting, because the superior vena cava, the posterior part of the right atrium and the inferior vena cava are kept wide open despite continuous drainage. Once full flow was achieved, the right atrial/central venous pressure was adjusted with a clamp on the venous line at 0 ± 2 mmHg and the right atrium was opened. Blood overflow was recovered with a pump sucker and various intracardiac procedures were realized.

Results: Full pump flow (4.2 ± 1.1 L/min) was achieved with gravity drainage alone in all experiments, although the uncoated temporary caval stent was visualized within the open right atrium continuously. No air lock occurred and various procedures were realized as follows: simulated tricuspid repair (n = 4), atrial septectomy (n = 3), trans-septal diversion of pulmonary venous return (n = 2), and other (n = 3).

Conclusion: Open right heart surgery without snares can be realized by temporary caval stenting with a single, long, and self-expanding venous cannula. This new technique has its biggest potential for intra-cardiac procedures with small access and/or hostile chests.

PE90—NON ISCHEMIC MR IN CABGS CANDIDATES

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The impact of etiology of associated mitral valve regurgitation and a valve procedure on operative and long-term outcomes after coronary bypass grafting surgery is yet to be clearly defined. The etiology of MR was determined by the patient's clinical history, echocardiographic findings and surgeon's observation at operating table. Several important studies have demonstrated that MR which persists long-term in patients with significant coronary artery disease results in poor survival.

In order to compare the characteristics and frequency of degenerative versus ischemic MR in patients undergoing CABGS, this study was performed. Since April 2007, 111 patients with significant MR underwent MV repair with different techniques.46 cases with degenerative MR versus 65 cases with ischemic MR. combined CABGS was done in 74 cases in which 65 patients belonged to ischemic MR group (group 1) and 9 cases to degenerative ones (group 2) and the third group consists of patients underwent only MV repair for degenerative MR.

Mean EF:
group 1 (33%),
group 2 (50%),
group 3 (51%)
Mean age:
group 1 (60 yr),
group 2 (59 yr),
group 3 (43)
M/F ratio:
group 1 (1.5),
group 2 (8),
group 3 (1.64)
Severe MR:
group 1 (20%),
group 2 (66%),
group 3 (100%)
Mean Cx:
group 1 (78 min),
group 2 (93 min),
group 3 (89 min)
Mean CPB:
group 1 (113 min),
group 2 (122 min),
group 3 (124 min)
Mean graft no:
group 1 (3.6),
group 2 (2.7),
group 3 (0)
Failed repair:
group 1 (3%),
group 2 (11%),
group 3 (2%),
overall 4 cases (3%)
Exp mort:
group 1 (5.84%),
group 2 (2.46%),
group 3 (2.37%)
Obs mort:
group 1 (3%),
group 2 (0%),
group 3 (0%)

With respect to the mean EF, mean age, M/F ratio, severe MR, and expected mortality, there is significant difference between these three groups.

It seems that correct diagnosis of etiology of mitral regurgitation and patients volume are the key points to acceptable mortality and failure rate and MV repair should be considered in all cases of MV regurgitation irrespective of etiology.

PE91—SURGICAL MYOCARDIAL REVASCULARIZATION FOR ACUTE CORONARY SYNDROMES: PREDICTION OF EARLY CARDIOVASCULAR COMPLICATIONS

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Objective: To determine the risk of cardiovascular complications in patients with Q-myocardial infarction after early surgical revascularization.

Material and Methods: CABG was performed in 183 patients with acute coronary syndromes. Depending on the clinical form of ACS patients were classified into 2 groups: with Q-MI (85 patients) and with unstable angina (98 patients). Instrumental examinations (echocardiography, 60-lead electrocardiotopography, ECG Holter monitoring, coronary angiography) and biochemical and hemostasiological blood tests were performed before and after surgery. Depending on the presence or absence of complications all survived individuals were divided into 2 subgroups: with favorable and unfavorable postoperative course of the disease.

Results: Two separate logistic regression model have been built to predict acute coronary events, perioperational myocardial infarction, fatal cardiac rhythm disturbances, and lethal outcomes in UA and Q-MI groups. Independent predictors of early postoperative cardiovascular complications in ACS patients have been revealed. Different risk stratification scales have been developed based on the complex evaluation of clinical, instrumental, and laboratory predictors. Strong cardiac predictors in model are LV and RV EF, systolic myocardial stress, local myocardial contractility index, LV end-systolic index, LV myocardial mass index, ∑PMI (painless myocardial ischemia), painless daily myocardial ischemia, cumulative lesion of coronary arteries, nqR, ∑nST, nT. Strong biochemical predictors in models are level of Tn I, von Willebrand factor, CRP, fibrinogen, and BNP. Developed additive scales of risk stratification allow to predict postoperative complications with Sn - 89.7%, Sp -89.8% for patients with UA (AUC = 0.912) and Sn - 83.3%, Sp - 81.0% with Q-MI (AUC = 0.886). Generalized scale

EuroSCORE showed worse result with Sn - 68.2%, Sp - 77.6% (AUC = 0.788) on this cohort.

Conclusion: Our original developed scale are able predict not only mortality but also other cardiovascular complications in cardiac surgery patients with ACS, when compared with the EuroSCORE.

PE92—MITRAL VALVE REPAIR FOR ISCHEMIC MITRAL REGURGITATION: 3D-GEOMETRIC AND ANATOMICAL CHANGING AFTER RING IMPLANTATION

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Objective: To assess the results of the new 3D-adaptive ring for the treatment of functional ischemic mitral regurgitation (IMR).

Methods: Combined CABG and mitral valve repair with original 3D-adaptive ring for ischemic MR was performed on 26 (4 females, 22 males) consecutive patients. Most of pts (73%) were in the New York Heart Association (NYHA) class III-IV. Tricuspid valve repair (6 pts), atrial fibrillation ablation (8 pts), and left-ventricular (LV) reconstruction (5 pts) were performed concomitantly.

Results: One patient died during hospital stay. Hospital survival was 3.8%. All survivors underwent clinical and echocardiographic follow-up at discharge. Following mitral annuloplasty, mitral regurgitation decreased from 3.2 ± 0.3 to 0.8 ± 0.3 ($P < .0001$). Only one patient had moderate MR. The Echo examination showed a mean MV area of 2.8 ± 0.36 cm^2 (range 1.8-3.3 cm^2) and a mean transmitral diastolic gradient of 3.8 ± 2.2 mmHg. Both LV end-diastolic and end-systolic volumes indexed significantly decreased (both $P < .05$) but systolic pulmonary artery pressure was unchanged ($P > .05$). Mitral valve tenting area, annulus area, septolateral distance at the level of A2-P2 and intercommissural annular distance decreased significantly ($P < .05$) after ring implantation.

Conclusions: The new 3D-adaptive ring «Plancor-A» ring is effective in relieving IMR in most of the patient. These 3D-geometric changes after mitral valve annuloplasty combined with coronary revascularization were associated with the improvement in the NYHA class. Clinically significant mitral stenosis was not detected during postoperative examination.

PE93—INCIDENCE OF LEFT AURICLE THROMBUS IN RHEUMATIC HEART LEFT ATRIOTOMIES

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Objective: The purpose of this study was to documents observed left auricle thrombus in patients having left atriotomy for cardiac surgery, at a new cardiac unit in developing country with high prevalence of rheumatic heart disease (RHD).

Methods: Patients demographic data, ECG, echography, left auricle findings, and mitral valve surgery were documented in all patients having left atriotomy from May 2008 to January 2011 and analyzed with SPSS.

Results: One hundred thirty-four patients, 89 females (66.6%) and 45 males (36.6%), with mean age of 23.78 ± 11.6 (range 7 to 58) years had left atriotomy performed for mitral valve replacement 82 (61.2%), repair 45(33.6%), open mitral commisurotomy 5 (3.7%) and myxoma 2, (1.5%) due to mitral regurgitation 89, (66.4%), stenosis 43, (32.1%) and myxoma 2, (1.5%) respectively. Three patients; (2.2%) two male (with mitral regurgitation) and one female (with mitral stenosis) in age range of 30-39 years had left atrial thrombus. Preoperative Transthoracic Echo (TTE) detected thrombus in two patients, with one male patient diagnosed on atriotomy! All patients with thrombus had atrial fibrillation, and left atrial diameter more than 8.5 cm. The thrombuses extended into the left atrial wall, laminated and were fixed. No embolic phenomenon observed in these patients.

Conclusion: Left auricle thrombus is rare though common in patients with atrial fibrillation and is associate with thromboembolism, though none was noted in the three patients. The left auricle thrombus missed on TTE had risk of embolisation during canulation and left atrium should not be manipulated before aortic cross clamp application in patients with RHD.

PE94—IS THERE A LESS INVASIVE THORACOABDOMINAL AORTIC ANEURYSM REPAIR?

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Background: This paper will present our experience with use of DeBakey type repair for thoracoabdominal aortic aneurysm (TAAA).

Methods: 4 male patients (55 ± 7 years) were treated in our center for TAAA. They were symptomatic; aneurysm dimension of 10 ± 2 cm. One patient had ongoing rupture for Crawford type I TAAA aneurysm of aortic arch, developed after ascending aorta, and hemiarch graft replacement previous aortic dissection. The others were Crawford III.

Surgery was performed through thoracophrenolaparotomy, employing DeBakey type repair with construction of composite end to end prosthesis between tubular and bifurcated graft and proximal end to side prosthesis implantation on thoracic aorta. In 1 patient we performed proximal end to side prosthesis implantation on previous ascending aortic prosthesis with reimplantation of cranial vessels and end to end anastomosis with both iliac arteries, followed by implantation of celiac trunk, superior mesenteric and renal arteries over 10 mm vascular graft.

Results: Patients remained hemodynamically stabile. Two patients had minimal blood loss discharged on the 8th-10th postoperative day. Two patients required prolonged ventilation and postoperative use of cell-saver. One patient who had previous laparotomy developed infection. The other had prolonged ventilation, tracheostomy, intestinal bleeding, sepsis, and paraplegia.

Conclusion: DeBakey type repair is less invasive approach.

Without use of extracorporeal circulation and reduced ischemic time, this technique avoids inevitable operative complications encountered with hypothermic circulatory arrest, partial cardiopulmonary bypass, partial left heart bypass, or clamp-and-sew strategy.

PE95—MITRAL VALVE REPLACEMENT IN LEFT VENTRICULOMEGALIA: IS PRESERVATION OF LEFT VENTRICLE NECESSARY?

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Aim: To determine the possibilities of correction of mitral valve disease (MVD) at left ventriculomegalia (LV) (end-dyastolic volume of the left ventricle ≥300 mL).

Material: Analyzed group consists of 57 patients (pts) with isolated MVD + LV operated during 2000-2006. To 21 pts was carried out mitral valve (MV) replacement + preserving of leaflets and subvalvular space of MV (group A), MV replacement 36 pts (group B). There were 35 males and 22 females in age 49.8 ± 5.2 years, all were in IV NYHA class.

Results: Among 57 pts, 2 died on the hospital stage (3.5%) because of injury of central nervous system (1 pts) and acute myocardial infarction (1 pts). In both cases there were no remarks to the surgical correction. The remote results of operations for 53 pts, discharged on the hospital stage, were followed for 49 pts during 6 months to 5 years. Good and satisfactory results were marked for all patients of group A (20 pts). There were no thromboembolic complications, dysfunctions of prosthetic, or reoperations. In group B (29 pts), 5 (17.2%) pts died because of heart failure (HF); unsatisfactory effect of operation was marked for 7 pts because of progress of HF (24.1%). The dynamics of Echo indices of left ventricle: for group A, end-systolic volume index (mL/m²), (ESV/s) 98.9 ± 8.3 (before an operation), 83.2 ± 7.3 (6-10 days after operation), and 71.2 ± 7.8 (remote period); for group B, ESV/s 95.9 ± 8.4, 86.2 ± 9.4, and 91.2 ± 11.8, accordingly; ejection fraction for group A 0.44 ± 0.04 (before an operation), 0.46 ± 0.03 (after an operation), and 0.49 ± 0.04 (remote period), for a group B 0.45 ± 0.03, 0.46 ± 0.04, and 0.39 ± 0.04, accordingly.

Conclusion: A correction of MVD with preservation of valve apparatus of MV is highly-efficient intervention at left ventriculomegalia, is associated with low risk of hospital mortality and good midterm results.

PE96—RETROGRADE CRYSTALOID CARDIOPLEGIA FOR ISOLATED AORTIC VALVE REPLACEMENT

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Objective: To present analysis of retrograde blood cardioplegia during isolated aortic valve replacement (AVR).

Materials and Methods: During 2009-2010, 104 patients (pts) with pathology of aortic valve disease (AVD) were operated by MVR in Institute. There were 43 (41.3%) males, 61 (58.7%) females. Average age was 53.8 ± 10.7 years. NYHA class in all group were followings:

II class - 2 (1.9%),
III class - 27 (26.0%),
IV class - 75 (72.1%) pts.

Decreased ejection fraction of left ventricle (<0.4) was marked in 31 (29.8%) patients. The reasons of AVD were: rheumatism, lipoidoses, atherosclerosis, and others. Systemic hypothermia 32 C, cardiopulmonary bypass, permanent retrograde cardioplegic solution (Custadiol) + external cooling of myocardium were performed in all patients. Average cross-clamping time was 54.8 ± 6.3 minutes.

Results: At whole group hospital mortality was 1.5% (n = 2/104). Reasons of deaths were pneumonia (1) and brain damage (1). There were no patients with heart failure. Average doses of dobutamin was 1.5-2.0 mcrg/min/kg during 48 hours. Duration of stay on artificial lung ventilation was 5.1 ± 0.5 hours, in intensive care unit 53.2 ± 4.3 hours, average time of the postoperative period staying was 11.8 ± 1.1 days.

Conclusion: Improved myocardial protection by using only permanent retrograde cardioplegic solution (Custadiol) with external cooling lead to better results and absence of postoperative heart failure.

PE97—BRAIN'S PROTECTION IN SURGICAL TREATMENT OF ACQUIRED VALVE DISEASES WITH NEUROLOGICAL DEFICITS

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Objective: To analyze different methods of brain's protection during correction of acquired valve diseases in patients (pts) with previous neurological deficits.

Materials and methods: During 01 Jan. 2000 to 01 Aug. 2008, 2348 pts with pathology of isolated mitral valve (MV) and aortic valve (AV) were operated with CPB. Following operations were performed: MV replacement (n = 2025), AV replacement (n = 323). In most cases myocardial protection was achieved with the use of ante-retrograde St. Thomas cardioplegia with addition of the blood (homemade) or using only cooling blood cardioplegia. Previous brain damage with neurological deficits (cysts) were

marked in 302 (12.9%) pts. There were 127 (42.1%) males, 175 (57.9%) females in age 27-69 years (mean 53.1 ± 13.2 years). NYHA classes were following: II-3 (1.0%), III-67 (22.2%), IV-232 (76.8%) pts.

This category we had divided on 3 groups:

(group A) 51 pts were operated with using perfluorocarbon (perftoran) only after cross-clamping of aorta in doses 200-300 mL,

(group B) 13 pts were operated with using perftoran after beginning of operation during 30 minutes and always before CPB in the same doses,

(group C) 87 pts were operated with using nimotop (50 mL during hole operation),

(group D) 151 pts were operated without brain protection.

In all groups (n = 302) CPB time was 98.4 ± 18.6 minutes, cross-clamping 62.5 ± 9.6.

Results: Hospital mortality was 2.3% (n = 7/302). Respectively for groups:

A - 1.9% (n = 1/51),

B - 0% (n = 0/13),

C - 0.0% (n = 0/87).

D - 4.0% (n = 6/151).

The reasons of deaths: heart failure (3), brain damage (2), pneumonia (2). Brain damage was marked only in group D (1.3%-2/151). There were 7 (2.3%) temporary neurological events at the hospital period in all group (n = 7/302) (one in group D - 4.6% [n = 7/151]).

Conclusion: Improved brain protection in pts with neurological deficits by using perftoran and nimotop gave better results and decreased risk on hospital period.

PE98—MULTIPLE VALVE SURGERY—EVALUATION OF PROSTHESIS TYPE SELECTION

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Objectives: Prosthesis type for multiple valve surgery remains inadequately evaluated. Clinical performance of multiple valve surgery with bioprostheses (BP) and mechanical prostheses (MP) was assessed to compare patient survival and composites of valve-related complications.

Methods: Between 1975 and 2000, 1245 patients had multiple valve surgery (BP 785, mean age 62.0 ± 14.7 years; and MP 460, mean age 56.9 ± 12.9 years). There were 1712 procedures performed (BP 969 [56.6%]; MP 743 [43.4%]; previous replacement procedures 298 [BP 241, MP 57]; and post-multiple surgery procedures 169 [BP 53, MP 116]). ConCABG was BP 206 (21.3%) and MP 105 (14.1%) (P = .0002). Follow-up was BP 5.131 years and MP 3.364 years.

Results: Unadjusted patient survival at 12 years was BP 52.1 ± 2.1% and MP 54.8 ± 4.6% (P = .1127), age adjusted survival was BP 48.7 ± 2.3% and MP 54.4 ± 5,0%. Predictors of overall mortality were age (HR 1.051, P < .0001), previous valve (HR 1.366, P = .028) and conCABG (HR 1.276. P = .021). Actual freedom from valve-related mortality at 12 years was BP 85.6 ± 1.6% and MP 91.0 ± 1.6% (actuarial P = .0167). Predictors of valve-related mortality were valve type (BP > MP) (2.61, (P = .001), age (HR 1.032, P = .0005) and previous valve (HR 12.61, P < .0001). Rate of valve-related mortality was BP 1.95%/pt-yr and MP 0.98%/pt-yr. (P = .0003). Actual freedom from valve-related reoperation at 12 years was BP 60.8 ± 1.9% and MP 85.6 ± 2.1% (actuarial P < .001). Predictors of valve-related reoperation were valve type (MP > BP) (HR 0.32, P < .0001), age (HR 0.99, P = .0001), and previous valve (HR 1.38, P = .008). Rate of valve-related reoperation was BP 6.67%/pt-yr and MP 1.93%/pt-yr (P = .0000). Early mortality for valve-related reoperation was BP 13.6% and MP 16.9% (P = .586).

Conclusions: Overall survival (age adjusted) is differentiated by valve type and valve-related mortality and valve-related reoperation favours use of mechanical prostheses, overall for multiple valve surgery.

Adult Vascular Surgery (Poster 99 – 103, 139)

PE99—OUR EMERGENCY SURGICAL PROTOCOL IN OUR CASE SERIES OF CAROTID ARTERIAL INJURY

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Objective: Carotid artery injuries can create very serious mortality and morbidity, these injuries should be intervened immediately and should be followed seriously during the postoperative period.

Methods: Patients who have come to the emergency room of our hospital and taken to emergent surgical operation were included retrospectively. Injuries were classified according to anatomic location (artery injury), zone of penetration, mechanism of injury, pathologic findings (complete transection, partial transaction, false aneurysm, arteriovenous fistula), and patency versus occlusion of the injured vessel. Patients with active uncontrolled bleeding and/or haemodynamic instability with little or no response to resuscitation were taken to surgery immediately. Computerized axial tomography (CAT) scan of the brain was performed in stable patients who had been in coma for more than four hours duration and/or who had focal neurological signs.

Results: Common carotid artery (CCA) and internal carotid artery (ICA) detected at emergency exploration were repaired-even in the presence of coma and /or neurological deficit. Similarly, injuries to the CCA and ICA discovered with angiography without the disruption of distal flow were repaired. 15 (82.5%) of the patients were male and 3 (16.5%) of they were female and the average age was 29.7 years. Four of all patients also had vena jugularis internal injury and primer repair was applied to these four patients. It was observed that two of our patients

had arteriovenous fistula and interestingly there was no external bleeding symptom and also hematoma was on minimum level.

Conclusion: The patients who have been immediately taken into surgery are from the young group, arterial wholeness, which will be provided without losing time during the surgery, will give satisfying results. We think that the less the duration of this period is the more the results will be better.

PE100—HYBRID OPERATION FOR AORTOPULMONARY FISTULA, A RARE COMPLICATION OF AORTIC ARCH ANEURYSM

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Aortopulmonary fistula is a very rare and fatal condition resulting as a late complication of thoracic aortic aneurysm. We present a case of patient who developed sudden onset of hemoptysis, dyspnea. Computed tomography presented ruptured aortic arch aneurysm into the left main pulmonary artery and pulmonary edema. Transthoracic echocardiography showed severe pulmonary hypertension and left to right shunt. We performed a emergent hybrid operation that involves the off pump arch vessels debranching with thoracic endovascular aortic repair in the operating room. The patient recovered well without recurrent hemoptysis. Early diagnosis and surgical intervention were crucial for the successful outcome. Hybrid operation with endovascular stent grafting may be a therapeutic option for treating patients with aortopulmonary fistula.

PE101—DOUBLE AORTIC ANEURYSM WITH ACUTE DISSECTION—A CASE REPORT

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Background: Aortic root aneurysm complicated with acute dissection is a surgical emergency. If associated with concomitant abdominal aortic aneurysm and dissection the surgical approach is technically demanding and the outcome guarded.

Clinical profile: A 58-year-old female hypertensive of 20 years duration presented with acute onset of abdominal pain with accelerating hypertension. Examination revealed large pulsatile periumblical mass with weak right lower limb pulses. Further workup with CT angiogram revealed a large fusiform aortic root aneurysm with chronic dissection and juxta renal abdominal aortic aneurysm with acute dissection. Multi slice CT coronary angio revealed normal coronaries. Trivial aortic regurgitation was present and her renal parameters were within normal limits.

Management Strategies: The patient was taken up for emergency aortic aneurysm repair under cardio pulmonary bypass. By cannulating left axillary artery and two stage single venous cannulation with LV vent. The ascending aorta was replaced with a 28 Decron conduit. The juxta renal aortic aneurysm was repaired with transperitoneal approach by aorto bifemoral reconstruction. Cardiopulmonary bypass was weaned off with good haemodynamics.

Results: Immediate postoperative stabilization was satisfactory.

Conclusion: Concurrent repair of aortic root aneurysm with abdominal aortic aneurysm in the presence of aneurismal sac dissection requires optimal technique of cannulation, extra corporeal circulation and haemostatic management. Endo vascular intervention in the form of Endovascular aneurysm repair [EVAR] is not feasible in this circumstance.

PE102—ROLE OF EXTRA CORPOREAL CIRCULATION IN NON CARDIAC SURGERY

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Background: Extra Corporeal Circulation [ECC] in non cardiac surgery like thoracic aortic aneurysm, Aortic dissection and renal cell carcinoma with cavo atrial extension is demanding procedure both for the surgeons and the perfusionist, were in the technique of cannulation and conducting extra corporeal circulation needs to be Standardized. We like share over experience.

Materials and methods: At PSG IMS&R–Coimbatore, retrospectively analyzed over 10 years from January 2001 to October 2010, those underwent Extracorporeal circulation for Non cardiac Surgery. They were grouped in to Group: A- Aortic Aneurysm thoracic :5, Thoraco abdominal :1, Group :B- Aortic dissection Type A : 3, Type B : 1, Group :C- Renal carcinoma caval extension :1, caval with RA tumour thrombus extension : 2.

Results: In Group- A : One patient developed major peri operative stroke. She had LA Descending thoracic aortic circuit for ECC for repair of ruptured distal aortic arch aneurysm. Rest of the group immediate post operative recovery midterm follow up satisfactory.

Conclusions: LA Femoral bypass is the commonly used extra corporeal bypass circuit to conduct thoraco abdominal aortic aneurysm and aortic dissection repair, Axillary cannulation need to be consider in infra renal aortic aneurysm with dissection and concomitant aortic root aneurysm. For Renal cell carcinoma extending to right atrium, SVC right femoral venous cannulation is requires for complete tumour extraction. Haemotherm mandatory in the extra corporeal circuit to maintain the core temperature.

PE103—CIRCULATORY ARREST FOR AORTIC SURGERY; DO WE NEED TO COOLDOWN?

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Deep hypothermic circulatory arrest is commonly used for ascending and transverse aortic surgery. As the technique is safe, well described and widely used, some side effects can affect the patient's outcome.

Fifty-seven patients operated on for aortic surgery (aneurysm and dissection) using circulatory arrest at 32 degrees with

antegrade cerebral circulation have been followed up for this study.

Few adverse events are observed as long as circulatory arrest time does not exceed 40 minutes.

Basic Sciences (Poster 104 – 111, 140)

PE104—17-β ESTRADIOL ATTENUATES THE ACUTE LUNG INJURY AFTER INTRATRACHEAL LIPOPOLYSACCHARIDE INSTILLATION: AN EXPERIMENTAL STUDY

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Objectives: Endotoxin is a major cause of endotoxinemia, sepsis, and pneumonia due to gram-negative bacteria. Experimental endotoxin administration has been used to study the biological and pathophysiologic pathways of inflammation. In particular, experimental intratracheal endotoxin instillation has allowed an extended research with regard to the local response of the lungs to the pathogenic stimulus. That represents an experimental model of adult respiratory distress syndrome (ARDS). This study aims to evaluate the efficacy of 17-β estradiol (E2) to ameliorate the acute pulmonary inflammation in vivo after intratracheal administration of the endotoxin lipopolysaccharide (LPS) in an in vivo animal model, as estrogens are known to have anti-inflammatory action in several experimental models.

Methods: Two groups of animals (male mice) were used for that purpose, a control group (single LPS administration), and a study group (subcutaneous E2 infusion, half an hour following LPS administration).

Results: We found that mononuclear recruitment, along with an increased population of CD4+ T-lymphocytes, is an early event during the course of LPS-challenged inflammation. In the study group, we determined that 17-β estradiol mediated the lung inflammation in a statistically significant degree ($P < .05$).

Conclusions: Our study establishes that systemic estradiol administration, after LPS instillation, may ameliorate the inflammatory lung response in vivo.

PE105—ADRENALINE DOWN-REGULATES INTERCELLULAR ADHESION MOLECULE-1 (ICAM-1) EXPRESSION IN THE LUNGS IN AN EXPERIMENTAL MODEL OF ADULT RESPIRATORY DISTRESS SYNDROME

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Objectives: Adult respiratory distress syndrome (ARDS) is a syndrome characterized by respiratory failure, associated with a variety of diseases, such as pneumonia, shock, sepsis, aspiration and trauma, and has high mortality rates. Critical proinflammatory events associated with the development of ARDS include macrophage activation, neutrophil recruitment and activation, endothelial injury with up-regulation of expression of adhesion molecules ICAM-1 and VCAM-1 and alveolar epithelial injury. Experimental intratracheal instillation of the endotoxin lipopolysaccharide (LPS) has been used in experimental models to study the pathophysiology of ARDS. This study aims to evaluate the efficacy of adrenaline to ameliorate the acute pulmonary inflammation in vivo, after intratracheal administration of LPS in an in vivo animal model, by regulating the expression of the adhesion molecule ICAM-1. The rationale for that hypothesis is that adrenaline suppresses the expression of the nuclear factor NF-κβ, which is related with ICAM-1 expression, by means of its β-receptors.

Methods: Two groups of animals (male mice) were used for that purpose, a control group (single LPS administration) and a study group (subcutaneous adrenaline infusion following LPS administration). Immunochemistry for ICAM-1 expression in lung tissue of animals of both groups was performed.

Results: We identified an up-regulation of ICAM-1 expression in the animals of the control group, suggesting an important role in the early pathogenesis of LPS-induced acute lung injury and a down-regulation of ICAM-1 expression in the animals of treated with adrenaline, concurrent with amelioration of inflammation.

Conclusions: Adrenaline may attenuate acute lung injury caused by endotoxin by means of down-regulating ICAM-1 expression.

PE106—AUTOLOGOUS PLATELET RICH FIBRIN-USING GROWTH FACTORS AS A NEW THERAPEUTIC OPTION FOR POSTOPERATIVE STERNAL COMPLICATIONS

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Background: More and more multi morbid people undergoing heart surgery. Some of them develop postoperative a healing problem of the sternum with and without deep sternal infection. Most of them show a complete sternal healing after conventional modern wound management. But some of them developed a chronically wound. Autologous Platelet Rich Fibrin (PRF) had become a valid option for patients not qualifying for reconstructive or plastic surgery.

Methods: We involved 58 patients with postoperative sternal complications in our study. All patients developed a chronic sternal wound problem under conventionally wound treatment. We draw 120 mL blood from every patient. After preparation processes were 5.2-6.9 mL PRF available. Using sutures sternal closure devices in combination with PRF we stabilize the sternum and closure the wound complete.

Results: All patients tolerated the procedure without any problem. After three weeks 44 patients show a complete wound closure or good wound granulation. Seven patients need a secondary closure with sutures. Only seven patients have not any positive effects.

Conclusion: Platelet Rich Fibrin offers a safe and effective alternative to other conventional wound management strategies. It is easy to use and without great problems for the patient. In our patients group the blood loss after preparation process were

unimportant. Only 3 patients need a blood transfusion. Further studies are warranted for individual identification of patients with profit from this procedure.

PE107—EXPERIMENTAL STUDIES COMPARING THE PERFORMANCE OF RAT LUNGS PRESERVED FOR 6 OR 12 HOURS SUBMITTED TO PERFUSION WITH LPD ("LOW-POTASSIUM DEXTRAN") AND HTK (HISTIDINE-TRYPTOPHAN-KETOGLUTARATE)

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Introduction: In lung transplantation, graft dysfunction is a frequent cause of mortality, whose etiopathogenesis is related to the ischemia-reperfusion injury.

Objectives: Compare the lung performance of rats after reperfusion, preserved with 3 solutions at 2 different times of ischemia.

Methods: Sixty male Wistar rats were anesthetized and randomized to receive anterograde perfusion by the pulmonary artery with preservation solution (LPD, HTK, or Saline). After extraction, the heart-lung blocks were preserved under hypothermia for 6 or 12 hours, perfused with homologous blood in an ex-vivo perfusion system (IL2 lung perfusion system, Harvard Apparatus) for 60 minutes. Respiratory mechanics, pulmonary weight, pulmonary artery pressure (PAP) and relative lung oxygenation capacity (ROC) measurements were obtained every 10 minutes. The results were statistically analyzed.

Results: Tidal volume (TV), compliance, resistance, ROC, PAP, and pulmonary weight did not differ between LPD, HTK, and Saline when 6-hour Groups and the 12-hour Groups were compared. TV was higher in the lungs with 6-hour ischemia in the LPD, HTK and Saline Groups. Compliance was higher in the lungs with 6-hour ischemia in the LPD and Saline Groups. There were no differences in ROC values when lungs with 6-hour ischemia in the LPD Group and lungs with 12-hour ischemia were compared. Significant difference was observed between lungs in the HTK and lungs in the Saline Groups. Resistance was higher in the lungs with 12-hour ischemia in the LPD, HTK and Saline Groups. There was gradual weight increase in the lungs, particularly those submitted to 12-hour ischemia, despite the absence of significant difference between groups.

Conclusion: Rat lungs perfused with LPD and HTK preservation solutions presented similar reperfusion performances in this ex-vivo perfusion model.

PE108—EFFECTS OF MYCOPHENOLATE SODIUM IN THE MUCOCILIARY SYSTEM: EXPERIMENTAL STUDY IN RATS

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Objectives: Evaluating the sodium Mycophenolate effects versus salt solution in the mucociliary system of rats.

Methods: Sixty male Wistar rats were used. Every rat was submitted to section surgery and left bronchial anastomosis. The rats were randomly divided: a group of 30 rats which received saline solution; Right lung control (S) and operated Left lung (SC); meanwhile the second group received also by gavage Mycophenolate, Right lung control (M) and Left operated lung (MC); until the sacrifice at the seventh, fifteenth and thirtieth day of treatment. Ciliary beat frequency (CBF) has been evaluated, mucociliary transport speed in vivo (MCTS); and the Velocity of Transport of the Mucociliary in vitro (PLT).

Results: The CBF is smaller in the MC group than M group, in thirty days ($P = .003$), and inside MC group, when comparing with the seventh and the thirtieth ($P = .0001$) day and the fifteenth and the thirtieth day ($P = .026$) of the treatment we noticed a worsening of CBF. About the MCTS there was an improvement in the SC group in the seventh and the thirtieth day ($P = .003$) and the seventh and the thirtieth day ($P = .005$) of treatment. The comparing the SC and the MC groups in thirty days we noticed that this MCTS is smaller in the second group ($P = .0001$). In the PLT there were no statistic differences between those groups.

Conclusions: The Mycophenolate associated to bronchial section reduces the CBF over time; the MCTS in the group that received salt solution associated to surgical procedure showed recovery, the same was not observed when associated to surgical procedure when submitted to Mycophenolate; and there was not any change in the quality of mucus in the studied sample.

PE109—DOES OBESITY INFLUENCE MECHANICAL PROPERTIES OF EXTRACARDIAC VESSELS?

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Objectives: Recent studies stress the role of adipose tissue as an endocrine organ. Adipokines are supposed to induce collagen tissue modifications that are present aside from the heart. The study was designed to analyze the mechanical properties of extracardiac vessels in obese and normal weighted patients.

Methods: Vital specimen of the aorta, arteria mammaria interna (IMA) and vena saphena magna (VSM) obtained from 53 patients undergoing CABG were examined. For stiffness measurements and force inhibition sinusoidal vibration was applied at optimal length while changes of force amplitude and absolute force were recorded. Patients were assigned to either the Control ($n = 7$, body mass index [BMI] < 25) or the Obese ($n = 46$, BMI ≥ 25) group. Both groups were statistically evaluated by student's T-test. Any BMI influence on mechanical properties of aorta, IMA and VSM was tested by linear regression.

Results: The Obese group showed significantly higher values of ratio force amplitude/ absolute force in the aorta than the Control group ($P = .021$). In IMA and VSM the Obese group showed the same trend (n.s.).

The higher the BMI the smaller absolute force in the vein ($P = .029$, $R = 0.3$).

Conclusions: Obviously extracardiac vessels are subject to severe alterations of their mechanical properties as a function of BMI.

It seems likely that intravascular flow dynamics are affected by these biophysical alterations in obese patients potentially contributing to the development of systemic and vascular disease.

PE110—A RECENTLY DEVELOPED POTASSIUM-CHLORIDE AND N-ACETYLHISTIDINE ENRICHED STORAGE SOLUTION ALLOWS PRESERVATION OF ENDOTHELIAL VASCULAR FUNCTION OF SAPHENOUS VEIN GRAFTS

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Objectives: Structural and functional impairment of the endothelial layer is associated with saphenous vein (SV) harvesting and storing. This increases the risk of graft thrombosis, intimal hyperplasia and accelerated graft atherosclerosis. We investigated the impact of a new potassium-chloride and N-acetylhistidine enriched storing solution (TiProtec©, Köhler Chemie) on venous endothelial function.

Methods: Vein segments (n = 29) were intraoperatively isolated and stored for 2, 24, and 96 hours. The segments were examined in a Mulvany-apparatus to assess vessel function. Following preconstriction with noradrenaline, concentration-relaxation curves were assessed for bradykinine and sodium-nitroprusside. We compared maximum wall tension and endothelial- and smooth-muscle-cell (SMC) dependent vasodilatation.

Results: After 2 hours of storage maximum vessel wall tension was significantly reduced in PSS-stored vessels (P = .0372). Likewise endothelial derived vasodilatory function was reduced significantly in PSS-stored segments (P = .0437). After 24 and 96 hours maximum vessel wall tension could be significantly preserved in TiProtec©-stored vessels (P = .0329 for 24 hours, P = .0424 for 96 hours). Endothelium dependent and independent vasodilatory function was maintained after 24 hours in TiProtec©-stored vessels and significantly reduced in PSS-group (P = .0048). After 96 hours endothelium dependent vascular function was nearly abolished in PSS-stored vessels (P = .0148).

Conclusion: Even short time storage in PSS damages endothelial vascular function. This loss of function could be reduced by TiProtec©. Therefore, TiProtec© is also a feasible option for longer time storage of saphenous vein grafts in CABG-surgery. With concern to the essential role of a faultless endothelial layer, TiProtec© should be given consideration to improve patency in vein grafts.

PE111—PREPARATION OF HUMAN CARDIAC EXTRACELLULAR MATRIX SCAFFOLDS FOR STUDIES OF STEM CELL BEHAVIOUR

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Objectives: Interaction between transplanted (stem) cells and the surrounding extracellular matrix may influence their differentiation, survival, integration and therefore the overall benefit of cardiac cell therapy. In order to study the interaction between stem cells and cardiac extracellular matrix (ECM), we tested the impact of several by decellularization protocols on the integrity of ECM derived from human left ventricular myocardium.

Methods: Human LV myocardium was cut in 1-3 mm thick slices and decellularized by incubation with various detergents (SDS, Triton X, Tween-20), enzymes (collagenase, trypsin, DNase) and other compounds (serum, saline preparations). Cell removal was verified by histological stainings (H&E, Sirius), immunochemistry (Desmin), DNA extraction and measurement. The ECM components collagen, elastin and glycosaminoglycans were quantified. Mesenchymal stromal cells (MSC) from human cord blood were used for recellularization, and their viability was assessed with the CellTiter 96® MTS assay.

Results: Tissue incubation in 0.5% SDS for 8 hours proved to be the most effective decellularization protocol and preserved a coarse ECM scaffold. Standard histology showed the absence of cellular material, including cell nuclei, and immunohistology demonstrated the absence of intracellular Desmin protein. Further incubation of ECM with fetal calf serum or DNAse reduced extracted DNA values to a minimum. Other decellularization methods, such as incubation in Triton X-100, Tween 20, or enzymatic digestion reduced DNA content but removed cellular material insufficiently and led to obvious destruction of ECM integrity. All decellularization protocols led to almost complete removal of glycosaminoglycans. Upon reseeding of the with human MSC, cell viability for up to 14 days was increased in SDS/serum decellularized cardiac ECM.

Conclusions: Human myocardium can be decellularized without major disruption of ECM integrity by using and SDS/serum-based approach. Such scaffolds can be re-seeded with MSC or other cell products, and may be used for studies of stem cell-ECN interactions.

Congenital Heart Disease (Poster 112 – 118)

PE112—SURGERY FOR PEDIATRIC ACTIVE INFECTIVE ENDOCARDITIS

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Objectives: Active infective endocarditis (AIE) occurs less commonly in children. We retrospectively analyzed the clinical and microbiological status and the results of surgical treatment over a period of 24 years.

Methods: Between April 1986 and December 2010, 1546 patients with AIE were operated upon. Of these, 31 (1.9%) pediatric patients (n = 21 male, median age 14 years, 7 months-17 years) underwent the following surgery: aortic valve replacement (AVR) (n = 5), homograft aortic root replacement (ARR) (n = 6), Ross operation (n = 3), mitral valve (MV) repair (n = 7), MV replacement (n =

2), and combined tricuspid valve (TV) surgery (n = 8) in 20 (62%) cases of native and 10 (38%) of prosthetic AIE. Underlying CHD was present in 62%. Follow-up (0-23 years) was completed in 91%.

Results: Preoperatively cerebral emboli were seen in 6 (19%), renal insufficiency in 4 (12%), aortic root abscess formation in 6 (19%), and sepsis in 4 (12%) patients. There were no operative deaths; 30-day mortality was 12.5% with 2 patients suffering from myocardial failure, 1 from septic MOF and 1 from hemorrhagic shock after ECMO implantation. One-year survival was 87.5%. Actuarial freedom from reoperation and actuarial survival after MV repair at 1 and 10 years were 100%. Early endocarditic re-infection occurred in 1 patient after ARR. In the long term 1 patient underwent reoperation due to homograft degeneration. Staphylococci species (31%) were the most frequent microorganism.

Conclusions: AIE is most likely to occur among young children with complex CHD.Atrioventricular valve repair for endocarditis yields excellent results in children and should be considered the primary surgical option in these patients. Homograft ARR and Ross operation are associated with low operative mortality and provide satisfactory early and long-term survival and favorable freedom from recurrent endocarditis and repeat operation.

PE113—OUR EXPERIENCE OF SINGLE STAGE REPAIR OF INTERRUPTED AORTIC ARCH AND ASSOCIATED INTRACARDIAC ANOMALIES

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Objective: Interruption of the aortic arch associated with intracardiac malformation remains a surgical challenge. We review our results during 7-years period with a single stage repair of the aortic arch interruption with associated intracardiac malformation.

Methods: Between 2004 and 2010 in the department of cardiac surgery of Children's hospital #1 14 patients underwent single-stage biventricular repair for aortic arch obstruction and associated intracardiac defects. The median age at operation was 13.7 days (from 3 to 39 days) and the mean weight was 3.2 ± 0,4 kg. There were 8 patients with type B (57.1%), 6 with type A (42.9%), and none with type C interrupted arch. Seven patients had only an associated ventricular septal defect. Other seven patients had association of complex malformations (five cases of truncus arteriosus and two cases with aorto-pulmonary window). All procedures was performed using median sternotomy, hypothermic bypass (18C), and circulatory arrest. Selective cerebral perfusion was not used in this patient group. In all cases the correction consisted of direct end-to-side anastomosis between the descending and the ascending aorta and total repair of associated heart lesions.

Results: There were two early deaths (14.3%). These patients died of low cardiac output. The median postoperative ICU stay was 10 days (range 3 to 28 days). The actuarial survival excluding early mortality was 100% at 1 year. There was no incidence of aortic arch reoperation or intervention during 1 year.

Conclusion: Single stage biventricular repair of aortic arch interruption and associated intracardiac defects can achieve good early and midterm results and low mortality rate. The optimal method of repair of IAA appears to be with direct anastomosis which allows to rely on the absence or minimal need for arch reintervention.

PE114—SURGICAL APPROACH TO A CASE WITH HYPOPLASTIC LEFT VENTRICLE AND SEVERE PULMONARY STENOSIS ASSOCIATED WITH HEMIAZYGOS CONTINUITY OF INFERIOR VENA CAVA

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Objective: Knowledge about cardiac and vascular abnormalities is significant in terms of identification of associated abnormalities. Azygos or hemiazygos continuity of inferior vena cava is a common finding but has significance in planning of surgical treatment of complex congenital cardiac malformations.

Method: Our case was a 14-year-old male. He had been investigated due to easy fatigability 4 years ago and diagnosis of TOF had been made. He had been offered a modified Blalock-Taussig shunt (mBTsh) operation but he had refused it at that time. Recently, he was investigated again due to worsening of dyspnea.

Results: Transthoracic echocardiography showed a large perimembranous ventricular septal defect and enlarged coronary sinus consistent with hemiazygos continuity. Fifty percent dextroposition of aorta was also identified. Severe valvular (peak gradient: 111 mmHg) and infundibular (peak gradient: 55 mmHg) pulmonary stenosis was also detected. LVEDD was measured as 30 mmHg (N: 35-47 mmHg). Common council of Departments of Pediatric Cardiology and Cardiovascular Surgery decided that mBTsh was the suitable therapy as decided 4 years ago. Cardiac catheterization showed hemiazygos continuity of inferior vena cava following a tract left to the vertebral column entering right atrium via coronary sinus (McGoon ratio: 2.2). With these findings he underwent a successful left mBTsh operation using 6 mm ePTFE graft and he was then discharged. Great precaution was taken during surgical dissection due to left localization of inferior vena cava. Late postoperative period of this patient remains event-free and total correction will be planned whenever suitable.

Discussion: Surgical procedures become complicated in anomalous systemic venous return. Existence of many associated cardiac anomalies and their complexity necessitate a detailed and precise diagnosis preoperatively.

PE115—SURGICAL TREATMENT OF A CONGENITAL ASCENDING AORTIC ANEURYSM ASSOCIATED WITH BICUSPID AORTIC VALVE: A CASE REPORT

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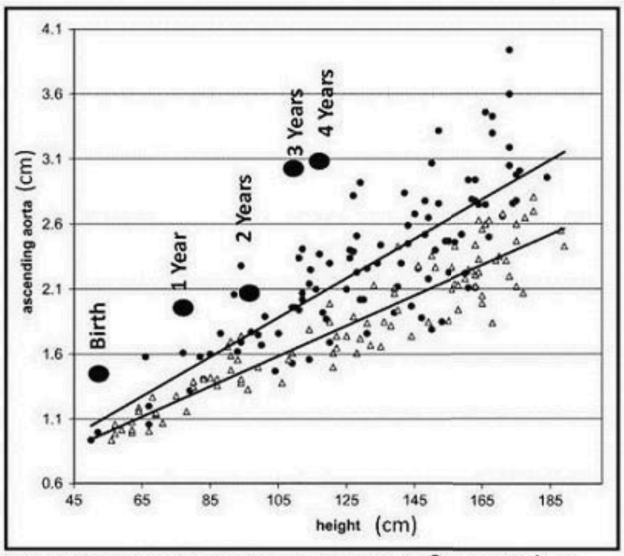
Introduction: Congenital aortic aneurysm is an extremely rare pathology, and the timing of surgical treatment is challenging.

We report our follow-up protocol, and surgical treatment of a case of congenital ascending aortic aneurysm associated with a bicuspid aortic valve.

Method: A newborn male of 2 days age, was referred to our center for the incidental finding of a systolic murmur during routine post-natal examination. Echocardiography demonstrated an ascending aortic aneurysm associated with a discretely stenotic bicuspid aortic valve (BAV). Body surface area adjusted Z-score of the ascending aorta was extremely high (5.3). Since the child was asymptomatic, it was decided to undertake follow-up echocardiography every 6 months, to analyse aneurysm dilatation rate, and BAV function (Figure 1). Replacement of the ascending aorta was indicated at 4 years, in order to prevent aortic dissection, since the body surface area adjusted Z-score increased to 7.9.

Result: Graft replacement of the ascending aorta was performed via midline sternotomy under normothermic cardiopulmonary bypass. BAV morphology was confirmed by surgical inspection, and cusp fusion was noted between the right and non-coronary aortic leaflets. The ascending aorta was replaced with an 18 mm ringed polytetrafluoroethylene graft. The post-operative course was uneventful. Pathologic examination of the aortic tissue confirmed a true aneurysm, without degenerative disorders. The 1 year postoperative follow-up showed normal aortic valve function with a discrete gradient.

Conclusion: Aneurysmal dilatation of the ascending aorta during childhood is very rare, and usually secondary to BAV. This combination generally needs a time frame of at least 1 year to generate an aneurysmal dilatation of the ascending aorta. The uniqueness of this case is the presence of congenital ascending aortic aneurysm at birth. It is important to maintain a balance between conservative follow-up and surgical treatment, because of the high risk of aortic dissection.



Mesuarements of the ascending aorta in cm for patients with BAV (●) and control (▲) as reported byRS Beroukhim et al. AJC 2006

● Addition of the presented case parameters

PE116—USE OF HYBRID ACCESS WITH TWO EPIMYOCARDIAL APPROACHES FOR CARDIAC RESYNCHRONIZATION IN CONGENITALLY CORRECTED TRANSPOSITION OF THE GREAT ARTERIES AND DEXTROCARDIA

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Introduction: To obtain cardiac resynchronization in a child with dextrocardia, corrected transposition of the great arteries (CCTGA), and complete A-V block, the authors used a hybrid access using the femoral vein, a sub-xyphoid incision and a previously implanted trans-thoracic epimyocardial lead.

Case-report: An 8-year-old male child, referred to our hospital for cardiac transplantation due to refractory heart failure. The patient had been submitted previously to 3 surgical procedures to treat a CCTGA and complete A-V block. At 6 months old he underwent, though a median sternotomy, a ventriculoseptoplasty and an epimyocardial pacemaker implant in the pulmonary ventricle. At age 2, the systemic atrioventricular valve had been replaced by a bio-prostheses. At age 6 the bio-prostheses was replaced. Progressive systemic ventricular dysfunction had occurred in the last 2 years, with worsening of functional class (I to III NYHA) despite optimum pharmacological treatment. Transthoracic echocardiografic evaluation showed systemic ventricle dilation and ejection fraction of 30%. After verifying that the pacing lead was implanted in the pulmonary ventricle and that the systemic ventricle was in touch with the sternum and the diaphragm, by using a thoracic computed tomography, a subxyphoid approach was decided for the systemic ventricular lead implant. The right atrial lead was implanted by transvenous femoral access. After confirming the good pace and sense conditions of the ventricular lead implanted eight years before, an atrio-biventricular pulse generator was implanted in abdominal wall. Hospital discharge occurred second post-operative day. Eight months after resynchronization the patient presented in NYHA class I, in spite of the absence of negative remodeling.

Conclusion: This hybrid access, guided by a CT scan, using the femoral vein, a subxyphoid incision and an old ventricular lead, permitted a minimally invasive approach for cardiac resynchronization in a child with a complex congenital defect and previous cardiac surgeries.

PE117—EXPERIENCE WITH CAVOPULMONARY ANASTOMOSIS AFTER NORWOOD PROCEDURE IN SURGICAL TREATMENT OF LEFT HEART HYPOPLASIA

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The treatment of left heart hypoplasia syndrome and other congenital heart defects accompanied by similar hemodynamics consists of consecutive performance of Norwood procedure, bidirectional cavapulmonary anastomosis and Fontan procedure.

Objective: To study the results of the second stage of surgical treatment—the operation for the creation of bidirectional cavapulmonary anastomosis after Norwood procedure.

Methods: From 2000 through 2010 in Children's Hospital #1 the operation for the creation of bidirectional cavapulmonary anastomosis after Norwood procedure was performed in 26 patients. Their age varied from 4 to 15 months, mean age, 9 months. Norwood procedure was performed in accordance with the standard technique with patch aortic arch reconstruction in 16 (61%) patients, and using R. Mee modification (direct aortic anastomosis) in 10 (30%). Central shunt was used for pulmonary blood flow creation in 12 patients (46%), the Sano shunt in 14 (54%). In most cases bidirectional cavapulmonary anastomosis was created under cardiopulmonary bypass on the beating heart (21 patient, 80%). Some operations in patients with previously created Sano shunt was performed without extracorporeal circulation. Two children required cardioplegia for the correction of associated pathology (mitral valve reconstruction in one and recoractation correction in another). Pulmonary artery reconstruction for bifurcation stenosis was necessary in 6 patients (23%).

Results: No early deaths occurred. Two patients (7.7%) died in the long-term follow up: one with meningococcal infection and one with heart failure due to tricuspid valve insufficiency. The remaining patients are in satisfactory condition.

Conclusion: Survival improvement after Norwood procedure leads to the increase of the number of patients in need for the next stage of treatment—the creation of bidirectional cavapulmonary anastomosis. Immediate results can be considered as satisfactory. We noted a high need of concomitant procedures.

PE118—TRANSCATHETER VSD CLOSURE AFTER CARDIAC SURGERY IN PATIENT WITH SY EISENMANAGER—CASE REPORT

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Background: A 41-year-old male in end-stage heart failure; congenital malformation of mitral and tricuspid valve, ventricular septum defect (VSD); severe pulmonary hypertension. He was cyanotic (O2Sat 56, Hb 16, Htc 45). Using transoesophageal echocardiography VSD, pulmonary artery (38 mm), severe mitral and tricuspid regurgitation have been visualized (EF = 15%, EDV = 265 mL, ESV = 202 mL).

Method: After mild cardioplegia, mitral and tricuspid annuli reconstruction, pulmonary artery (PA) was banded on 24 mm to increase right-to-left shunt and decrease aortic saturation, with consequent decrease in PA saturation. Lowered PA saturation results with decreasing of pulmonary resistance, opening closed capillary pulmonary net improving O2 diffusion in pulmonary vein O2Sat in patient was increased on 82 from 56 (without O_2), and Hb was kept on 14 with Htc on 45-50, postoperatively. Hemodynamic measurements during first 5 days showed that PA pressure was 50% of systemic pressure. After 2 years due relapse of mitral insufficiency patient got mechanical mitral valve with closure of membranous VSD with pericardial patch. Implantation of permanent pace maker was performed due registrated AV block IIIrd degree. After 6 months control ultrasound examination showed big VSD muscular part of septum. Patient was prepared for VSD device closure, which was last separate intervention.

Conclusion: Hybrid technique of VSD transcathether closure in patients after previous cardiac surgery intervention can be preferred approach, less invasive for the patient with good clinical outcome.

General Thoracic Surgery (Poster 119 – 137)

PE119—LEFT MAIN BRONCHUS FOREIGN BODY, MASQUERADING AS DIAPHRAGMATIC HERNIA IN AN ADULT PATIENT

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Objective: Foreign body aspiration is unusual in the adult. We present a case of food aspiration by a 31-year-old female, masquerading as diaphragmatic hernia.

Method: A 31-year-old female presented at the emergency department with shortness of breath of abrupt onset. Her past history was unremarkable. The chest X ray demonstrated total collapse of the left lung and herniation of the fundus of the stomach and large bowel into the left pleural cavity. Chest CT scan confirmed the presence of stomach and large bowel in the left chest. The patient was subjected to an urgent left posterolateral thoracotomy. The operative findings were total collapse of the left lung and local eventration of the left hemidiaphragm. Operative flexible bronchoscopy demonstrated the presence of large quantity of mucus at the origin of the left main bronchus, surrounding a soft mass adhered at the wall of the bronchus. Mucus was aspirated, the atelectasis of the left lung resolved and local plication of the diaphragm was performed. The patient had an unremarkable postoperative course.

Result: Ten days after surgery, flexible bronchoscopy showed the presence of a foreign body at the origin of the left lower lobe bronchus. Rigid bronchoscopy was performed the following day and a piece of meet was extracted.

Conclusion: Foreign body aspiration is unusual in adults, except those who are debilitated or have neuropsychiatric disorders. After foreign body enlodgement, local inflammation, edema, cellular infiltration and granulation tissue formation may contribute to airway obstruction while making bronchoscopic identification and removal of the object more difficult. Bronchoscopically, the object may appear as a tumor.Foreign body aspiration in the adult is a rare, but potentially lethal condition, and the thoracic surgeon must be suspicious of this condition, even if the patient history and imaging obscure the clinical picture.

PE120—LEFT LOWER LOBECTOMY PERFORMED SEVEN WEEKS AFTER LEFT ANTERIOR DESCENDING ARTERY STENT IMPLANTATION WITH DISCONTINUATION OF CLOPIDOGREL ONE DAY BEFORE OPERATION. A CASE REPORT

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Objectives: Patients with coronary artery disease (CAD) requiring major lung resection present a vexing dilemma with respect to appropriate treatment. Anatomical lung resection such as lobectomy or pneumonectomy may lead to an increased risk of perioperative myocardial infarction in patients with severe untreated CAD. Myocardial revascularization in patients with lung cancer may delay the resection, allowing progression of cancer.

Methods: We describe the case of a 65-year-old patient in whom left lower lobectomy was performed seven weeks after stenting of the left anterior descending artery (LAD).

Results: The patient underwent stenting of the LAD with a bare metal stent for a high degree stenosis (80%). He also had stenoses (50-60%) of the right coronary and circumflex arteries. He was discharged on dual antiplatelet treatment (aspirin plus clopidogrel) and scheduled for lung cancer surgery 7 weeks later. Aspirin was discontinued 5 days before operation, low molecular weight heparin (LMWH) (prophylactic dose) treatment started at the same time, until surgery, and clopidogrel administration was discontinued one day before surgery. The patient underwent a left lower lobectomy. LMWH treatment started the evening of the operation and clopidogrel administration started on the 1st postoperative day. Aspirin was added on the 5th postoperative day. Postoperative course was uneventful. The patient was discharged on dual antiplatelet treatment.

Conclusions: Strategies for prevention of perioperative in-stent thrombosis are required. Since there is evidence that dual antiplatelet therapies have additional benefits for up to 12 months following coronary stenting, it might be appropriate to maintain aspirin and clopidogrel administration during the perioperative phase of lung surgery following coronary stenting, irrespective of the time interval between stenting and lung resection. Aspirin and clopidogrel administration during surgery may increase the risk of bleeding. These drawbacks have to be balanced with the risk of perioperative in-stent thrombosis and myocardial infarction.

PE121—RUPTURED BULLAE AT ELDERLY IS IT A CHALLENGE?

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Pneumothorax (PT) due to ruptured bullous disease is usually resolved by simple chest drainage; if the air leaks persist and the underlying lung is not expanded resection of the bulla is mandatory. We try to investigate this algorithm to our patients over sixty years old.

Material and Methods: We retrospectively reviewed the charts of 10 patients with PT due to ruptured emphysematous bulla who need surgery; we excluded from this study the cases resolved by chest drain alone; the mean age was 63.75 years (60-73 years; the interval of trial to close the bronchopleural fistula just by chest drainage alone was from 5 days to 14 days; we use 8 axillary and 2 sparing-muscles thoracotomies; the resection of the bullae was made with staplers in 3 cases and manual in double layers with non absorbable sutures, in the other 7.

Results: The ruptured bullae were: 4 giant bullae tip III Reid, and 6 tip II Ried; in all the giant bullae due the thickness of the walls we use the manual sutures. We had no postoperative deaths within 30 days from the operation. The postoperative drain was removed after the ceased of the air leaks (mean 3 days, maximum 10 days) Prolonged air leaks for more or equal to 7 days were described after 3 procedures; 2 subcutaneous emphysema was noted and pneumonia in 6 cases. Postoperative hemoptysis was seen in all patients; In-hospital stay after surgery ranged from 8 to 21 days (mean 11.4 days). No-one was discharged with a chest tube and a one-valve valve.

Conclusions: It is generally agreed that bullectomy improves lung function and, consequently, quality of life. PT seen as a complication of ruptured bullaes is a good opportunity to achieve this goal despite the collateral morbidity seen in elderly. The use of open surgery can be an alternative to VATS.

PE122—SURGICAL TREATMENT FOR OCTOGENARIAN LUNG CANCER IN OUR HOSPITAL

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Objectives: In 2010 World Health Organization reported that the average life expectancy of the Japanese male was 79.59 years and that of the female was 86.44 years. In our hospital, octogenarians with lung cancer are increasing year by year in step with the increase of the average life expectancy. So we discussed surgical treatment for octogenarian lung cancer in our hospital.

Patients and Methods: The patients of lung cancer more than 80 year old who underwent surgical treatment between April 2002 and December 2010 were enrolled. The postoperative survival rate was analyzed by the Kaplan-Meier method, and the differences in survival rates were assessed by the log-rank test. Continuous data between two groups were compared using Mann-Whitney *U* test. A probability value of < 0.05 was considered significant.

Results: Surgical treatment was performed of 36 octogenarians; there were 25 men and 11 women with a mean age of 81.6 years old (range 80-85). In one patient, the operation was aborted due to unexpected metastatic disease discovered at the time of thoracotomy. The remaining 35 patients underwent 18 lobectomies, 1 segmentectomy, and 16 wedge resections. All patients recovered and were discharged home. Complications occurred in 10 of 36 patients (27.8%). Complications included pneumonia (4), empyema (2), prolonged air leak (2), atrial arrhythmia (2), and acute myocardial infarction (1). The average postoperative hospital stay was 13.8 days (3-109). Overall 3-year survival was 75%. Postoperative complications were not related to survival rate ($P = .491$). In addition, no significant difference of survival was observed between the types of surgery ($P = .17$).

Conclusions: Age itself isn't a risk factor for lung cancer operation. If there is no problem with patient's physical capacity, even octogenarian patients of lung cancer should be treated surgically.

PE123—TREATMENT MODALITY AND THE DIAGNOSTIC CLUES OF THE COMPLICATED HYDATID CYST OF THE THORAX

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Background: Complicated hydatid cyst of the thorax (CHCT) is important to the clinical approaches and treatment modalities in hytadid disease. The aim of this study was to evaluate the problems of CHCT including choice of surgical methods, diagnostic clues, and to discuss the inherent risks of medical therapy and the delay of surgical treatment.

Methods: Between 2002 and 2010,64 operations were performed in 61 patients. Posterolateral thoracotomy in all patients; a phrenotomy in 2, a thoracoabdominal approach in 1 and 2-stage bilateral thoracotomy was performed in4 patients. The preferred surgical treatment procedure was cystotomy and modified capitonnage, which was performed in 36 patients. Other procedures included a cystotomy in 20 and decortication in 10 patients. Lobectomy in 2, segmentectomy in 1, and wedge resection was performed in 5 patients.

Results: In 41 patients (66%), there were single hydatid cysts; while in patients with multiple cysts (34%). Eleven patients had preoperative hydatid cyst history. Iatrogenic rupture of an intact hydatid cyst occurred in 3 patients. Extrathoracic involvement in 10, intrathoracic but extra pulmonary involvement was apparent in 7 patients. The morbidity ratio was 3% and the mortality ratio was 1.7%. The average hospitalization for all patients was 5.7 days. The mean follow-up was 19.2 months with no recurrence.

Conclusions: CHC may cause different clinical manifestations and may present radiologically as a primary lung tumor. In patients with suspicious lung masses owing to endemic area, history of a hydatid cyst, or contralateral or extrathoracic hydatid cyst involvement at the same time should indicate a CHCT. Preoperative anthelmintic therapy must be avoided owing to the risk of perforation. Treatment of a CHCT differs from that of an intact hydatid cyst. Anatomic resection may be necessary owing to destroyed lung tissue secondary to suppuration from a hydatid cyst; however, parenchymal preserving surgery is preferable in an uncomplicated hydatid cyst. A modified capitonnage method is recommended for CHCT treatment as it has a low morbidity rate.

PE124—UNUSUAL MESENCHYMAL TUMOR "FIBROSARCOMA" OF THE MEDIASTINUM AND DIYAPHRAGMA

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Background: Here, we present unusual intrathoracic mesenchymal tumors as fibrosarcoma with management also clinical and radiological specialities.

Methods: We report 4 patients with mesenchymal tumors [3 men (37, 41, and 45 years old respectively), and 1 woman (44 years old). These masses were removed via a thoracotomy in all patients, between May 2007 and April 2010. Computerized tomography and magnetic resonance imaging make the diagnosis in all cases. Adjuvant chemo-radiotherapy was applied in two patients and only chemotherapy in one.

Results: Pathologic examination revealed fibrosarcoma in all patients. Two of them originated from mediastinal, and the others of the diaphragm. All of the patients were extubated in the early postoperative period. There were no postoperative mortality and morbidity. Mean hospital stay was 4.6 days (range, 2-11 days). Mean follow-up was 17 months (range, 2-45 months), while two patients are still alive (11 and 45 months), and the other patients died with common metastasis after 2 and 13 months following to the surgery.

Conclusions: The differential diagnosis includes other mediastinal tumors. The treatment of choice is surgical resection of the fibrosarcoma with a wide margin and also radiotherapy and chemotherapy can be received.

PE125—PRE AND POSTOPERATIVE MANAGEMENT OF LUNG MAJOR RESECTIONS IN ELDERLY

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Objectives: In Italy the population of patients over 75 years with a potentially resectable lung malignancy is increasing. The aim of this study is to assess the pre and postoperative management of elderly who underwent lung major resections at our Unit.

Methods: From January 2000 to June 2010 we evaluated 35 patients with NSLC candidates to major lung resection (mean age 78.09 ± 2.74 years). During preoperative evaluation we assessed performance status, comorbidities, and cardiopulmonary tests, excluding from major lung resection the patients with serious comorbidities, with inadequate cardiologic evaluation tests and procedures, with failing predictive lung function and exercise tests (ppo-FEV1 ≤40%; ppo-DLCO ≤40%; ppo-peak VO2 < 35% after rehabilitation physiotherapy too). Postoperative management included early mobilization, chest physiotherapy, antibiotic and antithrombotic prophylaxis, and thoracotomy chest pain control by NSAIDs continuous intravenous infusion in the first 48 hours. Finally we analyzed postoperative course and hospital stay.

Results: Of 35 patients with potentially resectable lung cancer that we analyzed, only 27 (mean age 78.41 ± 2.66 years) underwent major lung resection, and 8 underwent other types pulmonary resection. According to guidelines we excluded 8 patients; in the other 27 patients we performed 16 lobectomies of the right lung, 1 left pneumonectomy and 10 lobectomies of left lung; we performed all lung resections through a muscle sparing lateral minithoracotomy. We observed 10.56 ± 2.75 days of hospital stay; most common complications in postoperative course were prolonged air leak (n = 6; 22.2%), arrhythmia (n = 4; 14.4%), pleural effusion (n = 1; 3.7%), atelectasis (n = 2; 7.4%), and heart failure (n = 1; 3.7%).

Conclusions: Long-term survival rate justify the surgical major lung resection in elderly but the clinical stage of tumor is not the main factor to evaluate. The elderly should be considered always an high risk patient and postoperative outcome is strongly correlated to cardiopulmonary function and number and severity of comorbidities.

PE126—-MINIMALLY INVASIVE REPAIR OF PECTUS EXCAVATUM: A SINGLE INSTITUTION EXPERIENCE

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Minimally invasive repair of pectus excavatum has become the treatment of choice in many centers in the recent years due to successful results.

Between August 2005 and March 2011, 185 pectus excavatum patients between the ages of 6 and 36 (median age: 16) were operated on at our institute. 150 patients were male and deformity was symmetric in 122 cases. Scoliosis was the most common concomitant anomaly, being seen in 38 patients. One pectus bar was used in 115 cases, two in 65, three in 5 cases for the correction of the deformity. The median operation duration was 60 minutes (range: 20-180) and the median duration of hospital stay was 5 days (range: 2-10). According to the evaluation of the quality-of-life questionnaires 94% of the patients were satisfied with surgical outcome. Bars of the 18 patients have been removed on planned date without any recurrence.

Minimally invasive repair of pectus excavatum is a successful surgical technique and can be preferred for the short operating time, low morbidity, and high levels of patient satisfaction.

PE127—PULMONARY METASTASES—DEATH SENTENCE OR HOPE? METASTASECTOMY—A LONG-TERM ASSESSMENT

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Objective: The aim of the study was to analyse long-term effectiveness of pulmonary metastatic resections in relation to the type of primary neoplasm.

Methods: Data for 105 patients, operated between 2000 and 2010, suffering of lung metastases had been analysed. 52 (50%) of them were men and 53 (52%) women. The average age of patients was 59 (maximum 79, minimum 20). The primary neoplasm was malignant neoplasm of digestive system (34 cases; 25%), human reproductive system (24; 16%), kidney and urinary tract (21; 20%), bone, skin and tissue (14; 13%), bronchus and lung (13; 12%). The most frequently performed operations were: wedge resection for 60 (57%) patients and lobectomy 11 (11%). The unilateral thoracotomy was most common approach. The metastasectomy was performed only when the primary neoplasm was radically resected, no more metastases were noted in other organs, and patient's performance status was greater than 1 Zubrod degree.

Results: In early perioperative time no deaths were noted. The operations tolerance was good; the complications rate was similar to other thorax operations. The average survival after metastasectomy was 36 months. The longest survival was noted for human reproductive system (49 months); the shortest, for kidney neoplasm (29 months). Other observed survivals: digestive system 34 months, lung cancer 31 months. Survival was estimated using the Kaplan-Meier method (figure 1).

Conclusions: Radical resection of metastatic lesions to lungs is usually possible after adequate diagnostics, by lover level of complications and mortality. The distant results of surgical treatment lung metastases deteriorate due to the clinic of primary neoplasm.

PE128—THE INFLUENCE OF SOME FACTORS ON LATE RESULTS OF SURGICAL TREATMENT OF LUNG METASTASES

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The aim of the study is to define and estimate the outcomes of surgical treatment in patients with metastases from kidney, colon and uterus.

Material and Method: We analyzed 34 patents (median age 57 years, operated between 2004 and 2007.

There were 15 patients with metastases from kidney, 13 from colon, and 6 from uterus.

Survival time, morphology of metastases, and degree of malignancy (feature G) were evaluated.

Results: Feature G3 was found in 6 cases (17%), in 4 with metastases from uterus, and in 2 with metastases from colon. The most common was feature G2.

We observed significant correlation between feature G and patients survival with metastases from uterus carcinoma. However, there was lack of this correlation in cases with metastases from kidney or colon.

The likelihood of 3-year survival in colon metastasectomies was 0.56 and 0.2 in uterus.

In this study on average 2 metastases (1 to 8) were resected. We observed high negative correlation between survival and number of metastases, particularly with metastases from uterus (–0.82) and from kidney (–0.70). In cases with metastases from colorectal carcinomas there was lack of this correlation.

Conclusions:

1. The significant influence on prognosis in cases with lung metastasectomy was related to primary tumor and number of metastases. Less important in prognosis were size of metastasis and feature G.
2. However, independently from primary site of the carcinoma, feature G or size and number of metastases, the metastasectomy increased the survival time to some degree.

PE129—PULMONARY ASPERGILLOMA COMPLICATING HYDATID CYST OF THE THORAX: A CHALLENGING PROBLEM

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Aspergilloma is a saprophytic fungus infestation that colonizes preexisting cavitary lung diseases as malignancies, tuberculosis, sarcoidozis, bronchiectasis and lung abscess. Although aspergilloma has been reported in operated hydatid cyst cavities, it has rarely seen in unoperated cases.

We report 2 cases of pulmonary hydatid diseases with postoperative hemoptysis. Pathologic examination revealed aspergilloma accompanying ecchinoccal cysts.

Case 1: A 21-year-old female was referred for a cystic lesion in left upper lobe. She underwent cytotomy and cappitonage via muscle sparing thoracotomy for hydatid cyst. Aspergilloma was diagnosed in excised cysts samples. Her postoperative course was uneventful in the first month. She underwent left lingular segmentectomy via re-thoracotomy on the 6th week fallowing the first operation because of post-operative persistent hemoptysis.

Case 2: A 27-year-old male was operated on a simple hydatid cysts in left lower lobe. Cystotomy and cappitonage were performed as the surgical approach. Unlike ever, postoperative oozing hemorrhage and mild hempotysis which required 5 units blood and plasma transfusion was occurred. The histopathologic exam revealed a hydatid cyst complicated with aspergilloma.

Complicated hydatid disease is an entity that is different from simple hydatid cyst. Mortality and morbidity is frequent and pulmonary resection may be required. Usually, aspergilloma seen in operated hydatid disease in the cyst cavity. However it may also seen in case of uncomplicated or not operated hydatid cysts. Both of the simple and complicated hydatid cysts must be operated as soon as possible to avoid complicating with aspergilloma.

PE130—MINIMALLY INVASIVE SURGICAL TREATMENT OF A GIANT BRONCHOGENIC CYST

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Bronchogenic cysts are the most common congenital cystic lesions of the mediastinum. The cysts are always asymptomatic and the symptoms may vary depending on the location and compression of the adjacent structures. Mediastinal bronchogenic cysts can cause severe respiratory distress due to airway and vascular compression

A 39-year-old male was referred with a giant mediastinal cyst, complained of severe dyspnea and dysphagia. Chest computed tomography scans showed a large mass, compressing the pulmonary artery, superior vena cava, and tracheal bifurcation. He underwent drainage of the cyst via mediastinoscopy. Subtotal resection of the cyst wall was carried out due to dense adhesion to adjacent structures. Immediately after surgery, his symptoms resolved completely. However, the symptoms were recurred on the 4th month after the surgery.

Large mediastinal bronchogenic cysts in the subcarinal space can cause severe respiratory distress from airway and vascular compression. Although the high risk of recurrence, mediastinoscopy may be effective for urgent surgical treatment of the bronchogenic cysts with severe symptoms.

PE131—EXPERIENCE WITH PLEURAL CATHETER PLEURODESIS FOR MALIGNANT PLEURAL EFFUSION IN A TERTIARY HOSPITAL IN SÃO PAULO

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Objective: To analyze the experience with pleural catheter pleurodesis for patients with malignant pleural effusion in our hospital, focusing on efficacy and occurrence of adverse events on the periprocedure period.

Methods: Retrospective study involving 183 patients that underwent pleural catheter pleurodesis in our hospital from 2008 to 2010. Patients were analyzed in terms of demography, efficacy of the procedure—defined as the absence of recurrence in the periprocedure period—and the occurrence of adverse events during the same period, defined as the 30 days following pleurodesis.

Results: 183 patients were analyzed, 163 (89.1%) female and 20 (10.9%) male. The average age of patients was 59.75 years (SD 13.19). The predominant primary site was breast (48.6%), followed by lung (32.2%), lymphoma, and colon (2.7% each). Average effusion development time was 2.96 months (SD 2.45), with an average of 2 previous thoracentesis before pleurodesis (SD 2.44). Silver nitrate was the most used sclerosing agent (121 patients), followed by talc (62 patients). Average follow-up time after pleurodesis was 34 days (SD 109.34). As for adverse effects, 68 (37.1%) patients had occurrences, mainly hypoxia (16 patients), catheter obstruction (9 patients), chest pain (5 patients), and fever (4 patients). Two patients suffered from reexpansion edema, and 3 developed pleural empyema. One death was registered during the periprocedure period, and recurrence happened in 12 (6.5%) patients.

Conclusions: Chest catheter pleurodesis proved to be an effective procedure for symptomatic control in the majority of patients. Although the occurrence of adverse events was high, these were of low morbidity and easy management, leading to the conclusion that it is a safe procedure. Due to the greater comfort it provides to patients because of the catheter's small bore, pleural catheter pleurodesis showed itself an attractive tool for the management of these patients in our institution.

PE132—SAFETY AND EFFECTIVENESS OF THREE DIFFERENT DOSES OF SILVER NITRATE FOR PLEURODESIS IN PATIENTS WITH MALIGNANT PLEURAL EFFUSION: PRELIMINARY RESULTS

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Objective: To evaluate safety of pleurodesis with silver nitrate (SN) for malignant pleural effusions using three different dosages. Secondary objectives were to assess chest pain and effectiveness of SN pleurodesis in these different dosages.

Methods: Double-blind, randomized, prospective study including patients with malignant pleural effusion eligible for pleurodesis. Patients underwent chest catheter insertion followed by infusion of SN in three different concentrations and volumes: (Group 1) 0.3% 30 mL; (Group 2) 0.5%, 30 mL; (Group 3) 0.3%, 60 mL. Hepatobiliary, renal, hematologic, and inflammatory parameters were monitored through blood exams in the first 72 hours, on the 7th and on the 30th day. Pain, dyspnea and oxymetry were likewise measured. On the 30th day quality of life and effusion recurrence were evaluated according to a general questionnaire and chest CT scan, respectively. This is an ongoing trial.

Results: During one year, 57 patients met inclusion criteria, and 3 of them were eventually excluded due to trapped lung. Therefore, 54 patients (12 male, 42 female) have been studied so far, with an average age of 60.88 years (SD 12.81). Post-pleurodesis CRP levels and leukocyte count increased similarly in all groups. There was also no difference between groups in terms of chest pain following pleurodesis. Overall, 159 adverse events (CTCAEV v4.0) were observed, most of them mild, classified categories 1 and 2 (127 occurrences). Severe adverse events (category 3 or higher) were noticed in all groups, with apparently larger frequency and proportionality in group 3. Severe adverse events were: hypoxia (16 patients), anemia (4), and renal failure (1). Four fatalities occurred, none of them related to the procedure. As for effectiveness, only one recurrence was registered.

Conclusions: SN pleurodesis was very effective in all doses. Adverse events were more frequent than anticipated, and apparently more common in those who received a larger load of SN.

PE133—INFLAMMATORY CYTOKINES PROFILE, IN PLEURAL EFFUSION, AFTER LUNG TRANSPLANTATION

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Introduction: Lung transplantation is the procedure of choice for end-stage lung diseases. Despite all the improvements in surgical techniques and immunosuppression, postoperative complications early remain common, especially swelling of reperfusion (early graft dysfunction) and acute rejection. There are few studies evaluating the characterization of inflammatory cytokines after lung transplantation.

Objective: Determine the profile of inflammatory cytokines in pleural fluid after lung transplantation.

Methods: The study included twenty patients, age 17 to 61 years, underwent lung transplantation unilateral or bilateral, between August 2006 and March 2008. A sample of 20 mL was collected from the pleural fluid after lung transplantation, in periods of 6, 24, 48 hours, and so on, until a total of 10 days or until removal of chest tube for measurement of inflammatory cytokines. All samples of fluids were considered as exudates by Light's criteria.

Results:

Table 1. Results

IL-8	$P = .006$	6 h > 48h and 10d
IL-1β	$P = .032$	9d and 10d < 6h
VEGF	$P = .026$	6 h > 48 h and 10d
TGF–β	$P < .001$	6 h > all other periods 24h and 48h > 5d and 10d 9d and 10d < all other periods
IL-6	$P < .001$	6 h > all other periods 6h, 24h, 48h, 72h and 96h > 5d, 6d, 7d, 8d, 9d and 10d

Conclusions: There is a peak of inflammatory cytokines in the first 6 hours after transplantation. This can be explained by the recent surgical injury and the lack of an aggressive immunosuppressive regimen during this period. In our protocol, we started the calcineurin inhibitor (cyclosporine or tacrolimus) 24 hours after transplantation. We see a gradual decrease of cytokines, which occurs more sharply from day 4 post-transplant.

Clinical Implications: The characterization of pleural inflammation after lung transplantation is important for understanding the physiology of the procedure and the clinical complications.

PE134—PNEUMOTHORAX POST PAEDIATRIC CHEST DRAIN REMOVAL

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Objectives: Pneumothorax can be a major complication following chest drain removal. As paediatric patients having poor breath holding compliance the incidence in this group may be raised compared to the adult population. A small pilot study in this hospital showed a pneumothorax rate post chest drain removal as 6/39 (15.4%) which was high.

The aim of this article is to determine the incidence of pneumothorax post paediatric chest drain removal following updating the guidelines for removal, and staff education.

Method: A prospective audit was conducted using a structured proforma, including 93 patients aged 18 and under, admitted to Glenfield Hospital, who had a chest drain inserted. This included all eligible over a 6 month period.

Results: Ninety-three patients with 95 episodes of chest drains were included in the prospective audit. Four (4.2%) patients had a pneumothorax post chest drain removal, with 1 patient requiring a further chest drain insertion for pneumothorax, and 1 patient requiring a further drain due to recurrent pleural effusion. All patients who had a post procedure pneumothorax were under 1 year of age, with 3 having cardiac surgery, and 1 an empyema.

94/95 of patients had a radiograph post drain removal. 89% of patients were admitted for cardiac surgery, 5.4% due to empyema, 3.2% due to a pneumothorax, 1 patient post left upper lobectomy, and 1 on extracorporeal membranous oxygenation.

Conclusions: This study shows that the incidence of pneumothorax post paediatric chest drain removal is 4.2%, which has improved from the initial pilot study. Good removal technique improves complication rates with trained staff following structured guidelines less likely to encounter problems. The application of an occlusive dressing rapidly following suture failure helps to decrease exposure time and therefore pneumothoraces.

PE135—VEIL PIN INHALATION: A CLINICAL ENTITY

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Objective: Accidental inhalation of a foreign body (FB) is rare in the adult although more common in the child. But in certain countries especially due to certain social and customary practices while wearing head scarves women whilst holding straight veil pins in their mouth prior to securing their veils have accidentally inhaled the pin. Prompt diagnosis and immediate treatment can help prevent dangerous consequences.

Method: An asymptomatic 18 year Islamic Maldivian female was referred three days after a failed extraction of a veil pin that was initially lodged in the primary bronchus of the right lung using a flexible bronchoscopy. Chest x-ray and virtual CT bronchoscopy scan confirmed the pin to have migrated into the secondary bronchus of the right lower lobe. Using rigid bronchoscopy under general anaesthesia with slight supine trendelenburg position the FB with it sharp end pointing upwards embedded in granulation tissue was extracted using an alligator forceps.

Result: Although during removal the pin migrated further into the bronchus despite using postural drainage no complication was detected during or following bronchoscopy. Patient went home the following day.

Conclusion: Prompt recognition and immediate retrieval using rigid bronchoscopy is the treatment modality of choice and surgery is rarely required. Further preventative educational strategies should be implemented to reduce such an avoidable risk in this subgroup of people.

PE136—MEDICAL THORACOSCOPY IN TREATING LOCULATED EFFUSIONS

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Objective: Patients with loculated effusions require medical management with antibiotics, but the primary goals are formal drainage and diagnosis. We present our experience in managing these cases with medical thoracoscopy under local anaesthesia.

Material and method: Twenty patients, 12 men and 8 women ranging in age from 24 to 54 years were referred to our department. All of them presented loculated effusion and fibrinous adhesions with a partially trapped lung either due to pneumonia or residual hemothorax after chest tube placement. All patients complained for chest pain, 12 of them had fever, and 7 presented dyspnea. A medical thoracoscopy service has been set up in an operating room using no specialized equipment and at minimal cost. Under local anaesthetic and conscious sedation, with one or two points of entry and reusable instruments all loculations were opened, the purulent liquid was aspirated, the fibrinous adhesions were removed including the layer of visceral pleura in cases of trapped lung. At last, an accurately positioned chest tube was inserted and subsequent local treatment was facilitated with antiseptic solutions or fibrinolytics in 13 cases. In 3 cases histology revealed lung cancer and in 4 mesothelioma and chemical pleurodesis either with talk or bleomycin followed.

Results: There was no mortality or morbidity. In every case pleural sepsis was controlled, the lung was re-expanded and chest mechanics were restored. Hospital stay ranged from 3 to 5 days and no recurrence was observed.

Conclusion: Medical thoracoscopy is a simple, safe and cost-effective technique for treating loculated pleural effusions or hematomas, in cases, where simple chest drainage is proved to be insufficient, and provides a useful service in the setting of a hospital.

PE137—A TIP FOR CONTROLLING THE MAIN PULMONARY ARTERY DURING VIDEO-ASSISTED THORACIC MAJOR PULMONARY RESECTION: THE OUTSIDE-FIELD VASCULAR CLAMPING TECHNIQUE

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Cross-clamping the main pulmonary artery (PA) is a risky, stressful procedure for the general thoracic surgeon performing video-assisted thoracic major pulmonary resection (VATS). However, converting VATS to thoracotomy each time PA clamping is planned is a poor tactic. We present a simpler technique for VATS than the traditional method involving a thoracotomy. In VATS, DeBakey vascular clamps with double angle jaws are inserted through 1-cm access incisions. We clamped the main PA so as to maintain the limited visual field through the working port. Thus, we modified the position of these vascular clamps, which we call 'the outside-field vascular clamping technique'. Our technique should be used for VATS lobectomy to prevent conversion to open thoracotomy when one requires scheduled control of the PA during VATS.

Adult Vascular Surgery

PE139—ENDOVENOUS STENTS IN THE TREATMENT OF DEEP VENOUS THROMBOSIS

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Background: Percutaneous endovenous intervention (PEVI) has been shown to be an effective tool in the treatment of deep venous thrombosis (DVT). In the contemporary interventional era, placement of stents in the venous system has been far less frequent than its arterial counterpart. There is a paucity of data on the outcome of stents placed in the venous circulation. This abstract describes our experience with venous stents in the setting of DVT.

Methods: Over a period of 28 months133 consecutive patients who had presented with acute severe proximal DVT plus venous stenosis, underwent PEVI with adjunctive placement of 287 stents in the iliac and femoropopliteal veins . All patients underwent serial ultrasound (US) assessment every 6 months. Those with presumed DVT on US underwent repeat venography and intravascular ultrasound evaluation of their stents.

Results: There were 14 patients with presumed DVT who underwent repeat venography and intravascular ultrasound evaluation of their stents. The mean follow-up was 27±4 months. Stent thrombosis was found in 4%. There was no neointimal proliferation as a cause of stent occlusion. The mechanism of stent occlusion was external compression due to venosclerosis and thrombus extension from adjacent non-treated venous segments. There were no stent fractures, extrusion or perforation.

Conclusions: The results indicate that the natural history of stenting in the venous circulation is fundamentally different than that seen in the arteries. Venous stenting is associated with a possibly non-existent neointimal proliferation rate and a low stent thrombosis rate. In those who develop stent thrombosis , the symptoms are usually mild and appear early after stent implantation. As opposed to arteries, stent thrombosis in the venous system is not associated with major sequelae and is amenable to redo PEVI.

Basic Sciences

PE140—EFFECTS EVALUATION OF PULMONARY ISCHEMIA AND REPERFUSION IN RATS: COMPARATIVE STUDY WITH PERFADEX AND LPD-GLUCOSE SOLUTION

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Background: Pulmonary transplant is a consolidated treatment of pulmonary illnesses in advanced level. Although the great results, the morbidity and mortality of this therapy still be significantly modified by the ischemia-reperfusion injury. This one is characterized by injuries initiated after cerebral death, continue during the period of cold ischemia and finish with the reperfusion of the organ after implantation. For this reason is necessary to use preservation's solutions for solid organs transplants.

Objective: To evaluate, by experimental model of pulmonary perfusion ex vivo in rats (IL-2, Isolated Perfused Rat or Guinea Pig Lung System, Harvard apparatus), the effect of the commercial perfusion solution Perfadex® and the national solution manufacture LPD-glucose after cold ischemia and reperfusion.

Methods: Sixty adult male Wistar-Furth rats had been used, randomized for the following experimental groups, with 6 or 12 hours of preservation: Perfadex® (LPD, n = 20), national LPD-glucose (LPDnac, n = 20) and saline solution (SAL, n = 20). After the specific procedures, heart-lung block was extracted and connected to the Harvard apparatus for reperfusion with homologous venous blood of givers rats, to obtain measures of the perfusate (pressure, flow, pO_2, pCO_2 and pH) and mechanical ventilation (maximum inspiratory flow, complacence and current volume). Statistics analysis was carried by the program Statistical Package for the Social Sciences, version 12.0 (SPSS Incorporation, Chicago, IL, USA) and the comparison between the groups was made by variance analysis, with significance level of 5%.

Results: We got trustworthy and coherent results for the oxygenation and gaseous exchanges with LPD (P = .052) and LPDnac (P = .703). The complacence parameters revealed better in the lungs of 6 hours of ischemia in groups LPD (P = .008) and SAL (P = .006).

Conclusion: Therefore, when is observed the LPDnac conduct during time perfusion, we could conclude LPDnac have a similar behavior to the LPD.