

Simultaneous Valve Replacement and Venous Patch Repair of Superior Mesenteric Artery Aneurysm Due to Infective Endocarditis: A Case Report

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ABSTRACT

Background. Peripheral mycotic aneurysm development is a rare systemic complication of infective endocarditis.

Case report. We report on a case of a mycotic aneurysm of the superior mesenteric artery in a 66-year-old man with infective endocarditis of the mitral valve. After the mitral valve was replaced by a mechanical valve, a laparotomy was performed. The mycotic aneurysm was excised and the vessel was repaired by sewing an autologous venous patch at the neck of the aneurysm. Five years after the operation, the patient is doing fine, with a normal morphology and patency of the superior mesenteric artery.

Conclusion. Our case demonstrates that simultaneous valve surgery and repair of a superior mesenteric artery mycotic aneurysm by sewing a vein patch in the neck of the artery is a viable treatment option.

INTRODUCTION

Systemic complications occur in 22% to 50% of patients with infective endocarditis [Baddour 2005]. Between 2.5% and 10% of cases of infective endocarditis are complicated by mycotic aneurysms [Mansur 1986; Werner 1991; Baddour 2005]. The most frequent sites of involvement are cerebral arteries and the aorta [Werner 1991]. Aneurysms of the superior mesenteric artery (SMA) are extremely uncommon, comprising about 8% of visceral artery aneurysms [DeBakey 1953; Mansur 1986; Friedman 1987; Werner 1991].

CASE REPORT

A 66-year-old man presented with a history of persisting arthralgias over a period of 2 months combined with fatigue,

chill, fever, and a 10-kg weight loss. Echocardiography revealed vegetations on the anterior and posterior leaflet of the mitral valve (maximum size, 1.7 × 0.4 cm) combined with a severe mitral valve regurgitation. A computed tomography (CT) scan of the abdomen was performed because of increasing inflammatory parameters and the fact that CT imaging of the thorax showed hypo-dense lesions on the spleen. Besides a few small abscesses in the spleen, this examination revealed an aneurysmatic dilatation of the SMA compatible with an inflammatory aneurysm. Selective arteriography confirmed aneurysmatic dilatations of the SMA (Figure 1). *Streptococcus sanguis* was isolated from blood cultures. The patient underwent 6 weeks of antibiotic therapy (penicillin) after which he underwent operation.

Perioperatively the mitral valve seemed to be myxomatoid with the presence of vegetations on the anterior leaflet and a ruptured posterior leaflet. The mitral valve was replaced by a mechanical valve. Two saccular aneurysms on the SMA were excised. Patches of autologous vena saphena magna were used for closure of the defect (Figure 2). The patient recovered uneventfully from surgery and was discharged on the fifteenth postoperative day. A control duplex ultrasonography of the SMA 6 weeks after the operation revealed a morphologically normal SMA with a peak systolic flow of 1.22 m/sec. There were no signs of inflammatory relapse at that time. Cultures of the biopsy of the aneurysm remained sterile, as did the biopsy results of the excised valve.

Five years after the operation the patient is still doing fine. He has no complaints indicating recurrence of infection or aneurysm. The mitral mechanical valve is functioning normally. A control duplex ultrasonography of the abdomen shows a morphologically normal SMA with a maximum diameter of 0.5 cm and a peak systolic flow of 2 m/sec without turbulences.

DISCUSSION

To date, about 3 treatment options have been described in 37 cases of mycotic aneurysm to the SMA due to infective endocarditis (Table). The first successful treatment was described by DeBakey and Cooley in 1949 [DeBakey 1953]. They excised a 5-cm aneurysm from a 27-year-old woman without reconstruction of the artery and reported a 3.5-year follow-up in 1953.

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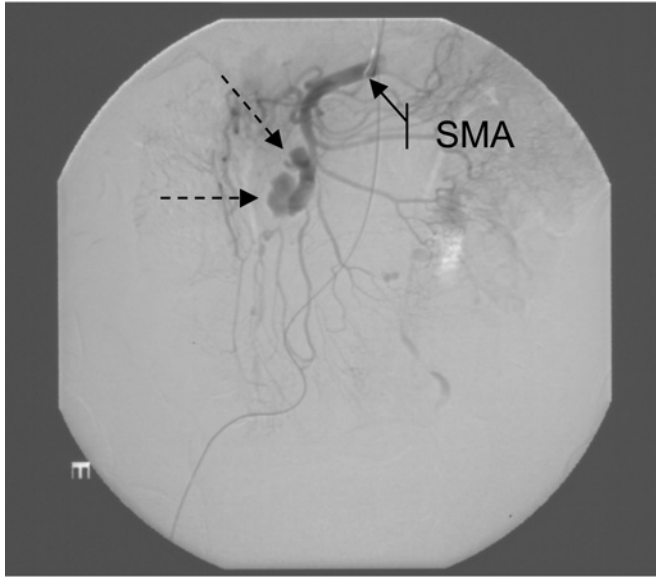


Figure 1. Selective opacification during angiography of the superior mesenteric artery (SMA) reveals 2 consecutive aneurysmatic dilations (arrows).

Further treatment options consist of embolization of the vessel and bypass grafting with a venous graft (Table). Unfortunately, as shown in the Table, only a few papers go into detail on either treatment modalities or long-term outcome of their cases.

Timing of surgical intervention for infective endocarditis remains the subject of intense debate and depends on the cardiac

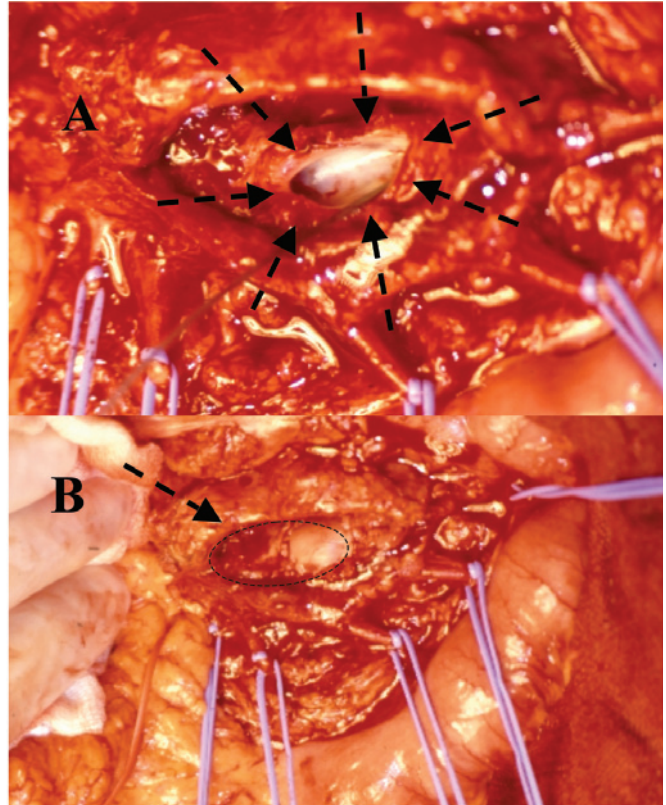


Figure 2. Perioperative images. A, Resection of the saccular aneurysm of the superior mesenteric artery (SMA) at the neck of the aneurysm. B, Repair of the SMA with an autologous vein patch (dotted line).

Previous Reports*

Author	Publication Date	Number of Cases	Endocarditis Treatment	Type of Treatment for Superior Mesenteric Artery				Timing of Treatment for Superior Mesenteric Artery	Follow-up
				Ligation and/or Excision	Venous Bypass	Vein Patch Repair	Embolization		
Friedman S et al	1987	19 (review)		14	1			Not mentioned to 3.5 y	
Volpe JR et al	1987	1	Conservative	1				NA	
Charlier P et al	1988	2	Surgery				2	Separate	
Ohmi M et al	1990	1	Surgery		1			Separate	
Werner K et al	1991	1	Conservative	1				NA	
Frikha I et al	1993	1	Surgery				1	Separate	
Staat P et al	1996	1	Conservative				1	NA	
Cassada D et al	1998	1	Surgery	1				Separate	
Silver SE et al	1999	1	Conservative				1	NA	
Cantisani V et al	2000	1	Conservative	1				Separate	
Chaussende C et al	2001	1	Conservative	1				NA	
Kozower B et al	2001	1	Conservative	1				NA	
Schmidt F et al	2002	1	Conservative		1			NA	
Erbay AR et al	2004	1	Conservative		1			NA	
Huang YK et al	2005	1	Conservative	1				NA	
Chu PH et al	2005	1	Surgery	1				Separate	
Javid PJ et al	2005	1	Surgery	1				Separate	
Rega F et al	2006	1	Surgery			1		Combined	

*NA indicates not applicable.

and systemic complications of the infection, the virulence of the organism, and the responsiveness to medical therapy. Some recommend surgery if there has been 2 episodes of embolization or 1 episode with residual large vegetations. However, there are no data from prospective controlled trials to support a firm recommendation [Baddour 2005]. No concomitant surgery of the infected valve and the SMA mycotic aneurysm has been reported so far.

Close attention must be paid to bowel viability intraoperatively, because ischemia may occur while ligating the artery, necessitating subsequent bowel resection [Friedman 1987]. Vessel repair by either vein patch or bypass graft guarantees blood flow and may reduce the need for bowel resection after ligation of the nutrient artery.

We report on a successful 5-year follow-up of a patient with a mycotic aneurysm of the SMA. We therefore believe that simultaneous valve replacement followed by resection of the mycotic aneurysm of the SMA and repair by sewing an autologous venous patch in the neck of the aneurysm can be considered a valuable treatment option in this type of pathology.

REFERENCES

- Baddour LM, Wilson WR, Bayer AS, et al. 2005. Infective endocarditis: diagnosis, antimicrobial therapy, and management of complications: a statement for healthcare professionals from the Committee on Rheumatic Fever, Endocarditis, and Kawasaki Disease, Council on Cardiovascular Disease in the Young, and the Councils on Clinical Cardiology, Stroke, and Cardiovascular Surgery and Anesthesia, American Heart Association: endorsed by the Infectious Diseases Society of America. *Circulation* 114:394-434.
- Cantisani V, Carbone I, Marcelli G, Venditti F, Bezzi M. 2000. A septic embolism and mycotic pseudoaneurysm of the superior mesenteric artery in a patient with enterococcal endocarditis. Their diagnosis by computed tomography and magnetic resonance angiography. *Radiol Med (Torino)* 99:285-7.
- Cassada DC, Stevens SL, Schuchmann GS, Freeman MB, Goldman MH. 1998. Mesenteric pseudoaneurysm resulting from septic embolism. *Ann Vasc Surg* 12:597-600.
- Charlier P, Cohen A, Eiferman C, Reizine D, Juliard JM, Merland JJ. 1988. Selective embolization of mycotic aneurysm of the branches of the abdominal aorta. *Arch Mal Coeur Vaiss* 81:1269-74.
- Chaussende C, Laurent C, Masson B. 2001. Infected aneurysm of the superior mesenteric artery. *J Chir (Paris)* 138:40.
- Chu PH SH, Lim KE, Chu JJ. 2005. Mycotic aneurysm of the superior mesenteric artery in a young woman. *Int J Clin Pract* 59:614-6.
- DeBakey ME, Cooley DA. 1953. Successful resection of mycotic aneurysm of superior mesenteric artery; case report and review of literature. *Am Surg* 19:202-12.
- Erbay AR, Turhan H, Dogan M, Erbas S, Cagli K, Sabah I. 2004. Brucella endocarditis complicated with a mycotic aneurysm of the superior mesenteric artery: a case report. *Int J Cardiol* 93:317-9.
- Friedman SG, Pogo GJ, Moccio CG. 1987. Mycotic aneurysm of the superior mesenteric artery. *J Vasc Surg* 6:87-90.
- Huang YK, Tseng CN, Hsieh HC, Ko PJ. 2005. Aortic valve endocarditis presents as pseudoaneurysm of the superior mesenteric artery. *Int J Clin Pract Suppl* 147:6-8.
- Javid PJ, Belkin M, Chew DK. 2005. Mycotic aneurysm of the superior mesenteric artery: a delayed complication from a neglected septic embolus—a case report. *Vasc Endovascular Surg* 39:113-6.
- Kozower BD, Windels MH, Gallagher RC. 2001. A complicated case of acute bacterial endocarditis. *Conn Med* 65:391-3.
- Mansur AJ, Grinberg M, Leao PP, Chung CV, Stolf NA, Pileggi F. 1986. Extracranial mycotic aneurysms in infective endocarditis. *Clin Cardiol* 9:65-72.
- Ohmi M, Kikuchi Y, Ito A, Ouchi M. 1990. Superior mesenteric artery aneurysm secondary to infectious endocarditis. *J Cardiovasc Surg (Torino)* 31:115-7.
- Schmidt F, Dinkel HP. 2002. Development of mycotic aneurysms of the superior mesenteric artery after septic embolism [in German]. *Radiologe* 42:564-7.
- Silver SE. 1999. Ruptured mycotic aneurysm of the superior mesenteric artery that was due to cardiobacterium endocarditis. *Clin Infect Dis* 29:1573-4.
- Staat P MI, Rabatel F, Duperret S, et al. 1996. Selective embolization of ruptured mycotic aneurysm of the duodeno-pancreatic arcade disclosing infectious endocarditis. *Arch Mal Coeur Vaiss* 89:1431-5.
- Volpe JR, Autrel D, Barral V, Brunelle F, Lallemand D. 1987. Infectious aneurysm of the superior mesenteric artery in a 14-year-old child. *J Radiol* 68:471-3.
- Werner K, Tarasoutchi F, Lunardi W, et al. 1991. Mycotic aneurysm of the celiac trunk and superior mesenteric artery in a case of infective endocarditis. *J Cardiovasc Surg (Torino)* 32:380-3.