

Mechanical Valve Thrombosis in a Pregnant Woman: A Case Report

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ABSTRACT

We report a case of metallic prosthetic valve thrombosis in a 24-year-old woman at her 36th week of gestation. With the onset of gestation this patient had been prescribed enoxaparin at a once-daily dose of 0.6 mL, which was lower than the recommended dose. The patient's mitral valve gradient was increased. We gave her intravenous unfractionated heparin because she refused to give consent for thrombolytic therapy owing to its potential hazards for the fetus. After the patient gave birth we treated her with a thrombolytic agent and the thrombus completely dissolved. Pregnancy in patients with mechanical valve prosthesis requires close follow-up and patient adherence to the prescribed medications. In case of thrombus formation both the fetus and the mother are at risk for fatal complications.

INTRODUCTION

During pregnancy the presence of a maternal prosthetic heart valve poses potential hazards for the fetus and mother. In pregnancy there is a tendency for coagulation and thromboembolic events to occur more frequently [De Boer 1989]. Inadequate anticoagulation increases thromboembolism risk, but anticoagulants have risks for both the mother and the fetus. We present a case of prosthetic heart valve thrombosis in a pregnant woman.

CASE REPORT

During her routine follow-up a 24-year-old woman in her 36th week of pregnancy was referred by her obstetrician to the Cardiology department of the Applied Research Center for Health of Uludağ University. The patient was completely asymptomatic, but 4 years earlier she had received a metallic mitral valve (Omnicarbon monoleaflet

valve, 29 mm; Medical Incorporated, Minneapolis, MN, USA) replacement as a sequel of acute rheumatic fever. Since then the patient had undergone oral warfarin therapy. With the onset of pregnancy, however, she had received only a once daily dose of 0.6 mL enoxaparin, and her warfarin had been stopped.

When she arrived at our clinic the patient's blood pressure was 120/70 mmHg and she had a pulse rate of 100 per minute. Cardiac auscultation revealed a normal closure sound of the metallic valve and a pan-systolic murmur. The physical examination was normal otherwise. During transoesophageal echocardiographic assesment a mobile thrombus of 2.1 × 1.2 cm in diameter on the ventricular side of the metallic mitral valve was noticed (Figure 1). The mitral valve gradient was higher than normal (Figure 2). The patient was given intravenous unfractionated heparin because she did not give informed consent for thrombolytic therapy owing to its potential hazards for the fetus. The dose of heparin was titrated with a target activated partial thromboplastin time ratio of at least twice the control. We also did not give the patient oral warfarin during her stay in our clinic. The

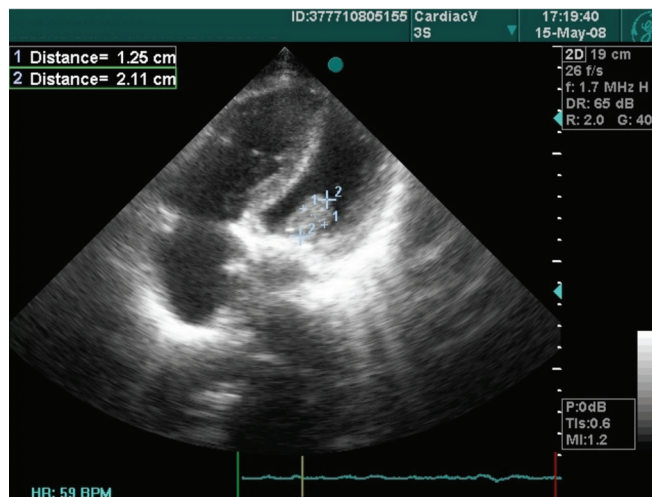


Figure 1. Echocardiogram performed at the time of admission shows the thrombus.

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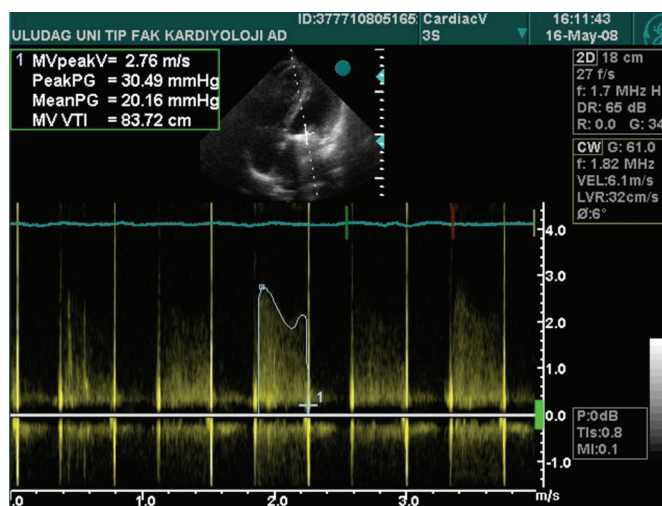


Figure 2. The echocardiographic image before thrombolytic therapy shows high transmitral valve diastolic gradient.

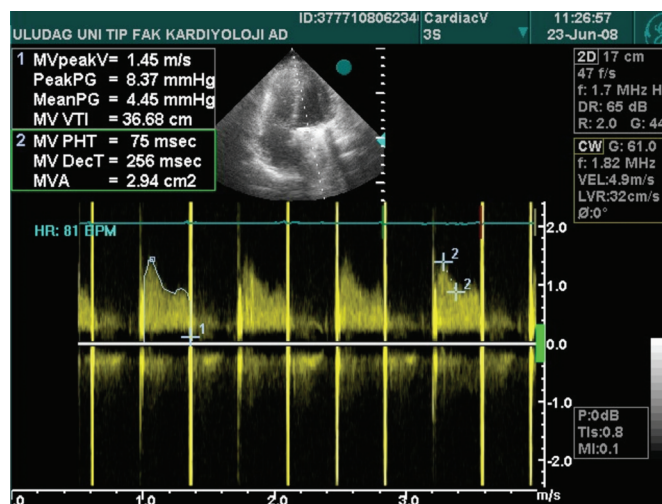


Figure 3. Echocardiographic image showing diminished transmitral valve diastolic gradient.

obstetricians continued routine follow-up of the patient during her stay in the cardiology clinic. The control echocardiograms 2 days later showed decrease in size of the thrombus while the patient was on unfractionated heparin only.

At day 24 of admission the patient was delivered of the fetus vaginally. She also had a control echocardiography 1 week after the delivery, which showed 0.5×0.5 cm of thrombus despite ongoing intravenous heparin therapy. So we gave her fibrinolytic therapy with 50 mg of tissue plasminogen activator. With fibrinolytic therapy the thrombus completely dissolved, and echocardiographic examination showed that the mitral valve gradient had decreased tremendously (Figure 3). After the initiation of oral anticoagulant therapy with warfarin with a target international normalized ratio of 2.5-3.5, the patient was discharged without any complications.

DISCUSSION

The main problem in case of a prosthetic heart valve in a pregnant woman is necessity for use of drugs that have different effects for the mother and the fetus. Heparin does not cross the placenta and is safer for the fetus. However, heparin use in this setting is associated with valve thrombosis or embolism in 12%-24% of cases. Although vitamin K antagonists are safer for the mother; by crossing the placenta they may cause abortion, embryopathy, and premature birth. However, between the 6th and 12th weeks of gestation the general risk is <5%. The risk with warfarin is dose related. The majority of valve thromboses are due to inadequate anticoagulation therapy during pregnancy. In the case we present the patient was on once-daily fractionated heparin on admission and probably did not have adequate anticoagulant therapy.

In general, pregnant woman with mechanical valves may be treated as follows: (a) warfarin throughout the whole pregnancy and elective cesarean delivery at the 38th week (probably the most safe way for the mother); (b) heparin and aspirin in the first trimester, warfarin for the second trimester, and return to heparin again during labor; or (c) heparin and aspirin for the whole gestational period. The type of heparin to be used is controversial. Unfractionated heparin causes osteoporosis and thrombocytopenia. Long-term use is difficult, the risk of thromboembolism is high for the mother compared to other options, and anti-Xa levels must be monitored [Chan 2000]. Low molecular weight heparin is advantageous and may be given 2 times a day [Aisling 2006].

Mechanical valve thrombosis is a serious condition, and rates of thrombosis with left-sided prosthetic heart valves and tricuspid valves are reported to be 0.5%-8% and 20%, respectively [Edmunds 1982; Thorburn 1983; Kontos 1989]. An obstructive thrombus causes dyspnea, heart failure, and decrease in functional capacity. Sometimes an embolic event may be the presenting sign. With heparin use only the occurrence of maternal thrombosis that threatens life is reported to be around 29%-33% [Hanania 1994; Chan 2000; Sadler 2000]. Thrombolytic therapy, although contraindicated in pregnancy, has been successfully used to treat valvular thrombosis in pregnant woman [Behrendt 2002]. In a single-center experience Sahnoun-Trabelsi et al treated 12 valvular thrombi in 10 pregnant women [Sahnoun-Trabelsi 2004]. Sahnoun-Trabelsi and his colleagues treated 3 cases with surgery and 9 cases with medical therapy (7 cases received thrombolytic therapy, and 1 patient received a heparin-only regimen). In this patient group 2 of the patients receiving thrombolytic therapy died (28%), both of them having mitral valve thrombosis and a state of cardiogenic shock. In our case, with only intravenous heparin infusion therapy a reduction in the thrombus was evident with echocardiographic follow-up. After labor, the thrombus persisted and lysis of it was achieved by use of 50-mg tissue plasminogen activator. In a study including 85 cases with prosthetic valve thrombosis (82 in the mitral position), thrombolytic therapy was superior to surgery [Lengyel 2001]. Heparin treatment only was ineffective and unsafe. In general, thrombolysis is the first-line treatment for obstructive prosthetic valve thrombosis,

independent of New York Heart Association functional class and thrombus size, if there are no contraindications. Surgery should be reserved for those patients in whom thrombolysis is contraindicated or has failed [Lengyel 2005]. However, 2006 American College of Cardiology/American Heart Association practice guidelines for the management of patients with valvular heart disease suggest surgery in case of large thrombus in left-sided mechanical valves [Bonow 2006].

In our case patient we achieved a reduction in thrombus size with unfractionated heparin. Of course at the beginning of treatment thrombolytic therapy also might have been used. However, the patient's history of inadequate anticoagulation made us try heparin first, and despite reduction in size the persistence of the thrombus led us to consider thrombolytic therapy after the delivery.

Pregnancy in case of mechanical valve prosthesis requires close follow-up and patient adherence to the prescriptions. In case of thrombus formation both the fetus and the mother are in trouble. We have to keep in mind that thrombolytic therapy may be safely used in this setting, although it is somewhat scary for the physician.

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