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Case report

Rare case of a patient with recurrent thrombosis of a mechanical valve during pregnancy

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ABSTRACT

There is always a risk during the pregnancy of a patient with a prosthetic valve. Thrombosis of a prosthetic valve is one of the most severe complications that may be life-threatening to both the mother and the foetus. Thrombosis of a prosthetic valve may be treated either with thrombolysis or surgically, which both may be accompanied by severe complications. Our case report presents the case of a pregnant patient who underwent treatment step by step with both of the methods mentioned above. At the time the first mechanical mitral valve thrombosis occurred, she underwent thrombolysis which was successful despite the transient neurologic deficit. Upon the recurring thrombosis during her second pregnancy, a decision was made to proceed with a reoperation to implant a mitral bioprosthesis due to high thrombotic risk. The pregnancy was later terminated for a genetic disorder upon the request of the patient.

Introduction

Pregnancy is accompanied with an increased incidence of thrombotic events. It is always risky in patients with a prosthetic valve, with a 1–4% mortality rate [1], usually due to thromboembolic complications [2]; therefore, the pregnancy of a woman with a prosthetic valve should always be carefully planned. When planning the surgery of a dysfunctional valve in women with childbearing potential the valvuloplasty is always preferred to the replacement. If it is necessary to perform the valve replacement, then there is a choice of either a more quickly degenerating bioprosthesis or a mechanical valve with a risk of thrombosis during the pregnancy being 10% [3].

The case report presents a recurrent thrombosis of a mechanical mitral valve in a repeatedly pregnant patient. Primarily the patient was given thrombolytic therapy; upon the recurring thrombosis she underwent a reoperation for a bioprosthesis replacement.

Case description

A twenty-nine year old patient, 19 weeks pregnant, two years post mitral valve replacement with a mechanical bileaflet prosthesis SorinBicarbon No 27 was admitted to our clinic in September 2012 with suspected thrombosis of the prosthetic valve in the mitral position. The valve was implanted in June 2011 due to mitral regurgitation resulting from a villous

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adenoma/tumour with retraction of anterior cusp. The attempt to perform annuloplasty failed and thus owing to a small annulus the mechanical prosthetic valve was attached. Four months after the mitral valve replacement the patient suffered from an ischaemic stroke accompanied with a closure of the middle cerebral artery as a result of an ineffective anticoagulation therapy.

Upon admission the patient was free of dyspnoea at rest, with stabilized blood pressure, no tachycardia, hospitalized at the coronary ICU, Cardiovascular Dept. At the beginning of her pregnancy she was switched to low molecular weight heparin (nadroparin). Her medical history revealed a recurrent leakage of about a half of the nadroparin dose from the injection site during administration. The dose was calculated based on the patient's body weight (i.e. 0.1 ml/kg). An initially performed transthoracic echocardiography (ECHO) demonstrated a moderately significant stenosis of the mitral prosthesis [MVA (mitral valve area) 1.2–1.1 cm^2, iMVA 0.78–0.71 cm^2/m^2], PG (pressure gradient) max. 24 mmHg, mean 10 mmHg, signs of mild pulmonary hypertension PASP (pulmonary artery systolic pressure) 35–38 mmHg and a good systolic function of the left ventricle. The finding of the transthoracic echocardiography was subsequently confirmed with a transesophageal echocardiography, resulting in the final diagnosis of mitral valve thrombosis (Fig. 1).

After consultation between the cardio team (cardiologists, cardiac surgeons) and the gynaecologists the decision was made to initiate a primarily conservative therapy – continuous enoxaparin infusion with anti-Xa assays. Despite satisfactory anti-Xa levels, on the third day of hospitalization while receiving the continuous low molecular weight heparin (LMWH) the patient experienced an elevated mitral prosthesis gradient (PG max. 28 mmHg, mean 19 mmHg), congestion in the pulmonary circulation and the finding of bilateral pleural effusions. Therefore, LMWH was replaced with an unfractionated heparin infusion to maintain APTT (activated partial thromboplastin time) 2–3 times above the limit of normal, followed by a slow thrombolysis along with the unfractionated heparin on the fourth day of hospitalization. The initial dose was 10 mg alteplase, followed by a continuous infusion of 3 mg/h (or 0.06 mg/kg/h); in 2 h the alteplase dose was up titrated to 5 mg/h (or 0.1 mg/kg/h). The follow-up ECHO conducted after 2 h demonstrated a gradual decrease in the mitral prosthetic valve gradient (see Table 1). For the entire period of the thrombolytic therapy administration the following parameters were checked every 4 h: Quick INR (International Normalized Ratio), APTT, fibrinogen, antithrombin 3; blood pressure, ECG and fluid balance. In the course of the seventh hour of the thrombolytic therapy the patient complained about abdominal pain; therefore a magnetic resonance imaging (MRI) examination of the abdomen was added, finding a segmental absence of perfusion at the right kidney lower pole with the diffusion restriction as a result of the embolism of right renal artery. Considering the absence of bleeding the thrombolytic therapy continued. In the course of the eighth hour of the thrombolysis, the dysarthria with mild left hemiparesis suddenly developed. The performed neurologic examination did not contraindicate further thrombolysis administration. In total, 100 mg alteplase was administered over 21 h. Upon terminating the thrombolysis a mild epistaxis occurred, not requiring a nasal tamponade. The patient felt significantly better, free of any pain, with a mild improvement of the neurologic deficit.

After completing the thrombolysis the patient continued receiving the continuous infusion of unfractionated heparin for the next 3 days, accompanied with APTT and fibrinogen checks in order to maintain the APTT 2–3 times above the limit of normal. Subsequently the patient was switched to subcutaneous enoxaparine every 12 h with anti-Xa assays. On the fourth day after the thrombolysis the patient still showed a mild central left monoparesis of the upper left limb; for that reason a follow-up brain MRI was added, which demonstrated a subacute right temporal to insular ischaemia. An ultrasound examination of the carotid arteries generated a normal finding at the extracranial cerebral arteries. The follow-up transesophageal ECHO was conducted on the fourth day after the thrombolysis, which visualized the mechanical prosthetic valve in the mitral position, free of any dysfunctions, with both discs well movable, without any thrombotic signs (PG max. 10 mmHg, PG mean 3 mmHg) (Fig. 2). Due to the demonstration of the embolism of the right renal artery, an additional urological examination, including a sonography of the kidneys, was arranged on the fifth day; the examination did not show any bilateral flow impairment through the a. renalis; the laboratory renal parameters were within the range of normal.

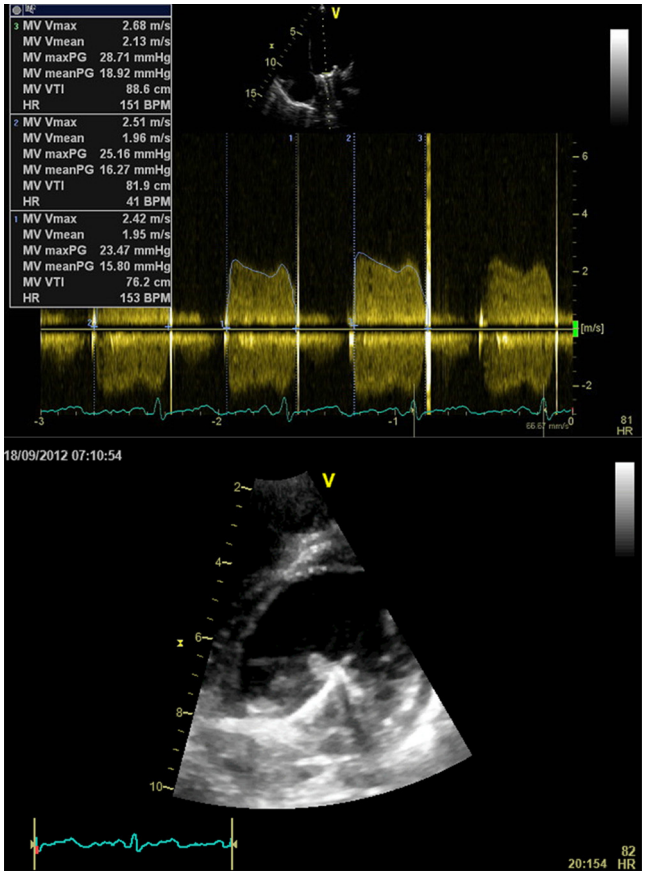

Fig. 1 – Transesophageal echocardiogram of the thrombosis of the prosthetic valve in mitral position.