CASE REPORT

Successful thrombolytic treatment of prosthetic mitral valve thrombosis

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SUMMARY

Prosthetic heart valve thrombosis is a rare but serious complication. Surgery is the first-line therapy in symptomatic obstructive mechanical valve thrombosis, thrombolytic therapy has been used as an alternative to surgical treatment. In this case report we described a 47-year-old woman who had undergone coronary artery bypass graft and mitral valve replacement operation 9 months ago. A thrombus was detected on the prosthetic mitral valve with high transmitral gradient by transoesophageal echocardiography. Tissue plasminogen activator treatment was administered successfully. The gradient was improved on prosthetic mitral valve and embolic complications or bleeding were not occurred.

BACKGROUND

Prosthetic valve thrombosis (PVT) is one of the most important and a rare complication in patients with prosthetic heart valve.¹ The diagnosis of PVT is made by clinical data and echocardiography. The treatment of PVT is surgery and thrombolytic therapy. We report a patient with mechanical mitral valve thrombosis who was successfully treated with a tissue plasminogen activator (tPA).

CASE PRESENTATION

A 47-year-old woman presented to our emergency room with a complaint of progressively worsening shortness of breath for 2 months. A prosthetic valve had been inserted in the mitral position, and coronary artery bypass graft operation performed 9 months ago. She had a history of non-Hodgkin's lymphoma.

INVESTIGATIONS

Her physical examination showed atrial fibrillation, decrease of the prosthetic click and lung congestion. Her heart rate was 120 bpm and arterial blood pressure 90/60 mm Hg. Routine blood investigations were normal, and international normalised ratio was subtherapeutic at 1.6 (target range 2.5–3.5). Transthoracic echocardiography (TTE) showed spontaneous echocontrast in the left atrium. Transoesophageal echocardiogram showed a 3×5 mm diameter thrombus on the prosthetic valve and transvalvular peak and mean gradient of 41 and 29 mm Hg, respectively (figure 1).

TREATMENT

The patient did not accept surgery; tPA was administered as a 10 mg bolus, and 90 mg infusion in 90 min. TTE showed well-functioning mitral valve prosthesis with no residual thrombus. The

transprosthetic peak and mean gradients improved significantly to 8 and 3 mm Hg, respectively (figure 2).

OUTCOME AND FOLLOW-UP

There was no evidence of embolic complications or bleeding. The patient was discharged after attaining the recommended level of anticoagulation.

DISCUSSION

Prosthetic heart valve thrombosis is a serious and urgent complication and related to the type and position of valve.¹ Management of PVT remains controversial. There are currently no randomised controlled trials favouring surgery over thrombolysis. Surgical treatment is associated with high risk of mortality, on the other hand thrombolytic therapy for left-sided prosthetic valve thrombosis is associated with cerebral embolisation, bleeding and recurrent thrombosis of the prosthetic valve.^{2–4} The recommended therapy for the patients with thrombosis left-sided prosthetic valve and the New York Heart Association (NYHA) functional class 3 or 4 symptoms is urgent surgery according to the American College of Cardiology/American Heart Association (ACC/AHA) guidelines.⁵ Fibrinolytic therapy should be considered if surgery is of high risk or not available.⁵ Likewise urgent or emergency valve replacement is recommended for obstructive thrombosis in critically ill patients without serious comorbidity (class I) according to the European Society of Cardiology (ESC) guidelines at 2012.⁶ In the case of haemodynamic instability, guidelines recommended tPA 10 mg bolus, and 90 mg intravenous infusion in 90 min with unfractionated heparin (UFH) or streptokinase 1.5 million units in 60 min without UFH.

Complete success rates of thrombolysis have been reported ranging from 71% to 91%. Duration of thrombosis is variable. Some authors reported thrombosis in 10 days related to the heparin-induced thrombocytopenia,^{7 8} while some authors reported very late as long as 32 years after the metallic valve replacement.⁹ Owing to the reason of chronic thrombosis or in the presence of pannus, fibrinolysis is less likely to be successful in mitral prosthesis.² The complications related to thrombolytic treatment are not uncommon. Death rates have been reported 2.8–11.8% and stroke were 4.4–6.7%.^{10–15} However, Ermis *et al*¹⁶ reported that complete resolve, ischaemic and haemorrhagic stroke rates with thrombolysis or surgery were similar. They concluded that thrombolytic therapy is effective and safe than surgery for

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Figure 1 Transoesophageal echocardiography shows a thrombus and the transmitral gradient on the prosthesis mitral valve.

Figure 2 The transmitral gradient after the fibrinolytic therapy.

specific patient groups who had functional class 3/4. In our case, thrombolytic treatment was successful and prosthesis valve echocardiographic parameters were improved.

Learning points

- Surgical intervention and thrombolytic therapy are treatment modality in prosthetic valve thrombosis.
- Thrombolytic therapy is effective and safe in the treatment of patients with prosthetic valve thrombosis and comorbid pathologies.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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