SCIENTIFIC EDITORIAL

Management of prosthetic heart valve obstruction:
Speech for the surgery?☆

Prise en charge des thromboses de prothèses valvulaires cardiaques :
plaidoyer pour la chirurgie?

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Prosthetic valve thrombosis has a reported incidence of 0.1 to 5.7% per patient-year. Major contributing factors are inadequate anticoagulant therapy and mitral location of the prosthesis. Valve thrombosis occurs with similar frequency in patients with bioprosthetic valves and in those with mechanical valves who are receiving adequate anticoagulant therapy. Likewise, in patients receiving adequate anticoagulation, the incidence of valve thrombosis is similar with caged-ball, single tilting disk and bileaflet valves.

Prosthetic valve thrombosis is a potentially life-threatening condition that requires prompt recognition and urgent treatment. The diagnosis may not be clinically apparent in some patients because of either minimal symptoms or intermittency of valve dysfunction. Physical examination is frequently insufficient, and diagnosis of valve thrombosis is established by fluoroscopy, transthoracic echocardiography (TTE) and above all transesophageal echocardiography (TEE).

The choice of optimal management remains controversial. Once the diagnosis of valve thrombosis is established, intravenous heparin therapy should be initiated promptly. If the thrombus is less than 5 mm in diameter on echocardiography and is not obstructing the valve, the patient can be treated with anticoagulation alone. The presence of a thrombus 5 mm or more in diameter is usually associated with a complicated course, requiring a more aggressive therapy such as fibrinolysis or valve replacement. The mortality rate associated with surgical therapy for valve obstruction is approximately 15%.

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but may be substantially higher for emergency operations in patients with haemodynamic instability. Valve replacement is preferred to thrombectomy because of the lower incidence of recurrent thrombosis. Thrombolytic therapy has a success rate of 70% and a mortality rate of 9 to 11%; it is more efficacious for aortic valve thrombosis than for mitral valve thrombosis as well as for patients with symptoms of less than 2 weeks' duration. Since thrombolytic therapy carries a considerable risk of embolization (up to 19%), it should be reserved for critically ill patients whose operative risk is high.

The article by Roudaut et al. [1] in this issue of the Archives of Cardiovascular Diseases confirms that prompt surgical treatment is associated with a better early success rate and a significantly lower incidence of complications than fibrinolysis in left-side prosthetic heart valve obstruction. The authors report on 263 cases in 210 patients, 127 of whom were treated by fibrinolysis and 136 by surgery, over a 23-year period. There was no difference between the two groups in the mortality rate: 10%. However, haemodynamic success was more frequent in the surgical group (89%) versus the fibrinolysis group (70.9%); embolic events were more frequent in the fibrinolysis group (15% versus 0.7%) as were total complications (25.2% versus 11.1%). During the 1980s, fibrinolysis was used at first. However, since 1990, with the introduction of TEE, surgery is preferred, perhaps because TEE has demonstrated incomplete haemodynamic success with fibrinolysis (greater sensitivity of TEE for residual thrombus detection) together with a risk of complications: systemic or peripheral embolism, transient ischaemic attacks...and recurrences.

This is the largest, single-centre, retrospective but non-randomized series reported in the literature. These results are in agreement with those reported previously [2–4], particularly the recent publication by the Montreal Heart Institute [5]. The authors reported their 20-year experience: 5430 operations, 4924 patients and 39 cases of prosthetic valve thrombosis, and a surgical procedure rate of 82% (thrombectomy 47%, mitral valve replacement 47%, aortic valve replacement 6%). The 30-day operative mortality was 25%, and the 10-year actuarial survival after prosthetic valve thrombosis was 46%. However, in this study, valve thrombectomy was performed in patients with fresh thrombi related to a recent change in the anticoagulation management, and valve replacement was performed in all other patients. Moreover, before discharge, aspirin was added to warfarin treatment.

In contrast, for intravenous thrombolytic treatment of mechanical prosthetic valves, a study using serial TEE over a 4-year period in 32 symptomatic patients relates an initial success of 53%, increasing to 88% after repeated thrombolytic sessions, with rates of 2% for death and 2.8% for cerebral embolization [6]. For these authors, intravenous thrombolysis was associated with a low risk of complications and a high rate of success in both obstructive and non-obstructive prosthetic valve thrombosis. Similarly, for Shapira et al. [7], in a series of 12 patients with stuck bileaflet mitral valves without large clots (< 5 mm), thrombolysis offered a valid alternative to surgery, with a high success rate (83.9%) and minimal complications (33.3%). In these studies, the success rate for fibrinolysis was higher than in Roudaut et al.’s study (88 and 83.9% versus 70.9%), although the populations are different. Therefore, two remarks are important and can explain the reverse in strategy during the past two decades (decreasing use of fibrinolysis and increasing use of surgery).

Firstly, TEE findings are very important in guiding therapy, showing thrombus size and location [8], with a risk of complications: systemic or peripheral embolism or transient ischaemic attacks...and recurrences with fibrinolysis. In addition, TEE can reveal pannus formation, defined as excessive wound fibrosis around a prosthetic valve, and is a definite indication for prosthetic valve replacement.

Secondly, over the past 20 years, recent advances in surgical technique (shorter extracorporeal circulation and cross clamp time, better protection, fast track, etc.) as well as in intensive care unit management, have improved surgical results.

In conclusion, in agreement with guidelines from the European Society of Cardiology [9], surgery is recommended for obstructive valve thrombosis except for:

- critically ill patients (with comorbid conditions severely impaired cardiac function prior to developing valve thrombosis);
- when surgery is not available immediately and for non-transferable patients;
- thrombosis of tricuspid or pulmonary valves, in which case, fibrinolysis should be considered.

For non-obstructive prosthetic thrombosis, management depends on the existence of thromboembolic events and on thrombus size: medical therapy (optimized anticoagulation) for a small thrombus (< 10 mm) and surgery for large ones (≥ 10 mm) or for thrombus complicated by embolism. Aspirin can be added to anticoagulant treatment [10].

References

