

Fibrinolytic Therapy in Thrombosis of Bioprosthesis in the Aortic Position

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SUMMARY

Thrombosis of heart valve prostheses is a complication associated with high mortality. It is extremely infrequent in bioprostheses and its treatment is controversial (as in the case of mechanical prostheses), representing a challenge.

We report the case of an elder patient who underwent an aortic valve replacement with a bioprosthesis and presented acute heart failure 6 months later. The transesophageal echocardiogram showed thrombosis of the bioprosthesis.

Infusion of streptokinase was prescribed for 24 hours; the patient presented clinical and hemodynamic improvement and no adverse outcomes were reported.

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Key words >

Heart Valve Prosthesis - Thrombosis - Fibrinolysis

Abbreviations >

FC Functional class

EF Ejection fraction

TEE Transesophageal echocardiogram

BACKGROUND

Prosthetic heart valve thrombosis is a complication associated with high mortality that requires appropriate diagnosis and therapeutic management. Bioprosthetic valves were introduced with the aim of reducing the incidence of thromboembolic events and the complications associated with the permanent use of anticoagulant agents; however, bioprostheses undergo progressive structural deterioration. Thrombosis of bioprosthetic valves is very infrequent (1, 2) and its treatment is controversial, as in the case of mechanical prostheses.

CASE REPORT

An 82-year old man was admitted with acute heart failure. He had a history of hypertension and had undergone an aortic valve replacement with a 21-mm St. Jude Biocor bioprosthesis associated with coronary artery bypass graft surgery 6 months before hospitalization.

He consulted due to progressive dyspnea that had started 10 days before; at the moment of admission he was in NYHA FC IV with acute heart failure. A transthoracic echocardiogram (TTE) informed preserved left ventricular systolic function (EF = 60%); the bioprosthetic valve did not present structural damage but a gradient across the bioprosthesis was recorded: peak gradient 100 mm Hg, mean gradient 58 mm Hg. The prosthetic aortic valve area, calculated by the continuity equation, was 0.63 cm². Transesophageal echocardiogram (TEE) revealed that bioprosthetic valve leaflets were normal (without structural deterioration). A structure with soft echodensity, similar to that of myocardium,

was appreciated at the level of the prosthetic valve and produced prosthetic obstruction. This image was suggestive of a small to medium sized thrombus (Figure 1) that generated an effective prosthetic valve area of 0.68 cm² measured by planimetry.

An intravenous infusion of 250000 UI of streptokinase was administered in 30 minutes, followed by 100000 UI/h during 24 hours. A subsequent TTE demonstrated significant improvement in transprosthetic gradients: peak instantaneous gradient decreased by 50% (41 mm Hg) (Figure 2) and mean gradient was 20 mm Hg. The parameters of systolic function remained unchanged and the effective prosthetic valve area increased to 1.01 cm². Fibrinolytic therapy was then discontinued, serum fibrinogen levels were determined and therapy with IV unfractionated heparin was initiated, followed by oral anticoagulation treatment. The patient made favorable hemodynamic and clinical progress and did not require vasoactive drugs. No therapy-related complications were reported.

DISCUSSION

Bioprosthetic valve dysfunction is generally due to structural deterioration secondary to an intrinsic abnormality. Extrinsic causes include infective endocarditis, pannus formation and thrombosis.

The distinction between pannus and thrombus is essential if thrombolytic therapy is contemplated, as the former does not respond to thrombolysis and the latter is characterized by a short duration of symptoms and short time interval after valve replacement. Echogenicity is another parameter useful to differentiate between both conditions, as thrombus has soft

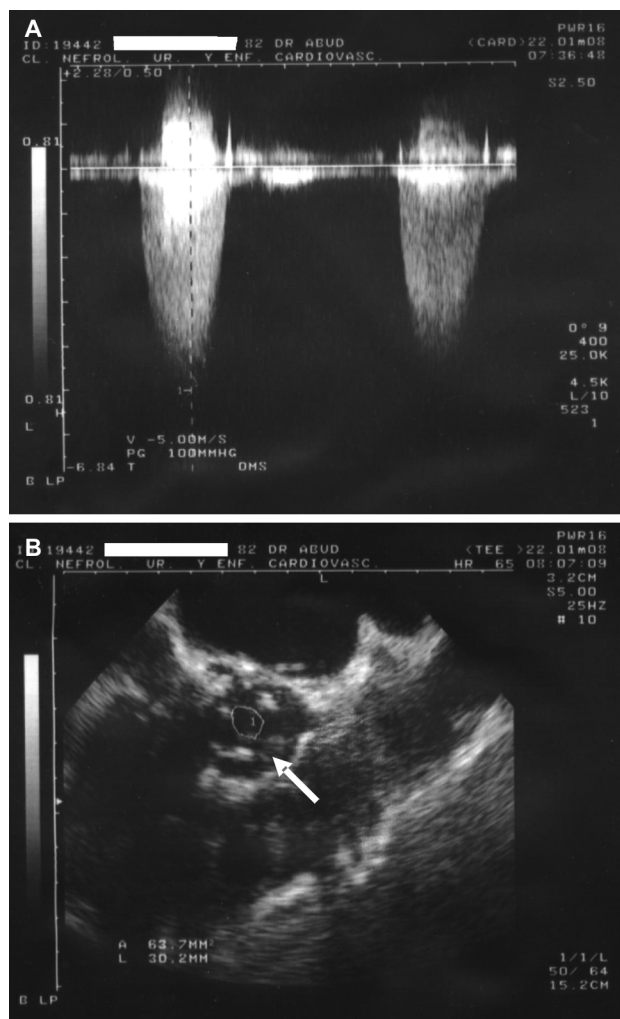


Fig. 1. A. Peak transprosthetic gradient (100 mm Hg). **B.** TEE showing prosthetic valve thrombosis (arrow).

echodensity. (2) The cause of thrombus formation is usually inadequate anticoagulation.

Prosthetic valve thrombosis has an annual incidence of 0.034-0.15%; (1, 2) for this reason there are no specific recommendations for this condition. Treatment of prosthetic valve thrombosis is controversial in general.

Current guidelines recommend emergency operation for patients with a thrombosed left-sided prosthetic valve and NYHA functional class III-IV symptoms, while thrombolysis may be considered as a first-line therapy in case of contraindications to surgery or for thrombosed right-sided prosthetic heart valves. (4)

Despite that circumstance, operative mortality is extremely high (33% - 88%), especially in patients in FC III-IV. (5, 6)

Fibrinolytic therapy has been evaluated in different series that reported low mortality rates, between

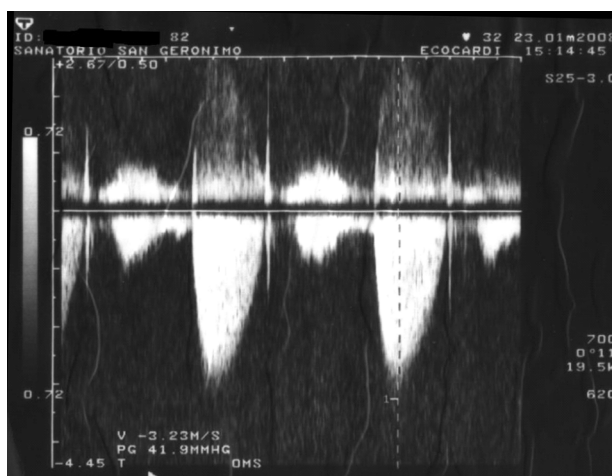


Fig. 2. Improvement of transprosthetic gradient after the infusion of streptokinase.

2.8% to 11.8%, (7, 8), and an incidence of embolism of 2.6% to 19%. Rethrombosis is the most frequent complication during follow-up and has adequate therapeutic success after a new thrombolytic therapy. It should be noted that the diagnosis of bioprosthetic valve thrombosis was only clinical as we did not perform a histopathologic study to confirm it.

A flow of ideas is currently postulating the need for new guidelines for management of prosthetic valve thrombosis (9) in order to recommend thrombolysis as a first-line therapy for patients with prosthetic valve thrombosis in FC III-IV, while surgery should be reserved for those patients with failed thrombolysis. In patients in FC I-II, the indication of fibrinolytic therapy or surgery will depend on the individual decision and on the findings of the TEE. (10, 11)

RESUMEN

Fibrinolytic Therapy in Thrombosis of Bioprosthesis in the Aortic Position

La trombosis protésica es una complicación que se asocia con una mortalidad elevada. Las que se presentan en bioprótesis son extremadamente infrecuentes, lo cual plantea un desafío terapéutico dado que su tratamiento, tanto en válvulas biológicas como mecánicas, es controversial.

Se describe el caso clínico de un paciente añoso con reemplazo valvular aórtico con implante de bioprótesis, que a los 6 meses presenta un cuadro de insuficiencia cardíaca aguda. En el ecocardiograma transesofágico se evidencia trombosis protésica.

Se realizó infusión de estreptocinasa por 24 horas, con mejoría tanto clínica como hemodinámica, sin que se presentaran eventos adversos.

Palabras clave > Prótesis valvulares cardíacas - Trombosis - Fibrinólisis

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