Thrombosed Prosthetic Valve in Tricuspid Position
Successful Therapy with Intravenous Streptokinase

Vivek K. Mehan, M.D., D.M.; Bharat V. Dalel, M.D., D.M.; and Purshottam A. Kale, M.D.

The successful use of streptokinase therapy in a child with chronic thrombosis of a prosthetic valve (Carbomedics) in the tricuspid position is presented.

(Chest 1992; 102:1599-1600)

Thromboembolism is a major complication of mechanical prosthetic valves, with a reported incidence of 1 to 6 percent per year.1,2 Thrombosis is more common with a prosthesis in the atrioventricular position than the aortic position.3 In the tricuspid position an incidence of up to 20 percent has been reported for mechanical prostheses.4,5 We report the use of streptokinase in the treatment of a chronically thrombosed prosthetic tricuspid valve in a child who had undergone surgical thrombectomy for the same complication in the past. The efficacy of streptokinase and the use of noninvasive modalities for the evaluation of thrombolytic therapy are described.

CASE REPORT

An eight-year-old girl had undergone tricuspid valve replacement with a 31-mm valve (Carbomedics) at the age of five years for a dysplastic tricuspid valve. One year later, she presented with evidence of right-sided heart failure, following omission of warfarin therapy. A diagnosis of a thrombosed prosthesis was established, and complete surgical thrombectomy of the valve was performed. During surgery, the valve disks were found to be covered by thrombus and fixed in a semiopen position. Following surgery, the valve’s function returned to normal, and the patient’s condition improved. She was discharged on warfarin therapy, with prothrombin time maintained at 1½ times control.

Thereafter, the patient remained asymptomatic for two years until one day, during a routine follow-up, it was diagnosed that her valve had rethrombosed. Examination revealed an elevated jugular venous pressure with prominent a waves and a slow y descent and a 4-cm tender hepatomegaly. No prosthetic valve sounds were audible; and a long, grade 3/6 middiastolic murmur and a grade 2/6 pansystolic murmur were heard at the tricuspid area. The patient was totally asymptomatic at this time but admitted to having omitted warfarin for two months; since then, the valve clicks had also become inaudible to her.

The patient’s electrocardiogram revealed sinus tachycardia with right atrial enlargement. A chest roentgenogram showed a cardiothoracic ratio of 60 percent and a prominent right atrial contour. A phonocardiogram at the tricuspid area demonstrated a prominent middiastolic murmur and the absence of prosthetic valve clicks (Fig 1A). A two-dimensional (2-D) echocardiogram revealed immobile disks of the prosthetic tricuspid valve in an almost fully closed position. Doppler evaluation revealed peak and mean diastolic gradients of 13 and 9 mm Hg across the tricuspid valve, and the tricuspid valve area by pressure half-time was estimated as 0.3 cm². Mild tricuspid regurgitation (grade 1/3) was detected (Fig 2A). Cinefluoroscopy revealed immobile disks of the prosthesis.

In view of the patient’s history of omission of warfarin and loss of

*From the Department of Cardiology, K.E.M. Hospital, Parel, Bombay, India.
of right heart failure, tricuspid diastolic murmurs, and reduced prosthetic valve sounds. Occasionally, patients may be asymptomatic, as in our case. Phonocardiography, M-mode and 2-D echocardiography, Doppler evaluation, and cinefluoroscopy provide noninvasive methods of confirming the diagnosis and monitoring the efficacy of therapy.

In our patient, surgical débridement of the valve had been carried out previously, but she again developed thrombosis of the prosthesis precipitated by discontinuation of warfarin therapy. Such repeated thrombosis of a tricuspid prosthesis has been reported previously, even with adequate anticoagulation. Surgical débridement or replacement of thrombosed valves carries a high surgical mortality, ranging between 8 and 42 percent, since it involves reoperation in a patient with prior cardiac surgery. A third operation in our patient could have been catastrophic; hence, thrombolytic therapy was the more viable alternative. Although thrombolytic therapy is commonly prescribed for an acutely thrombosed prosthesis, it may also be useful for chronically thrombosed valves, as shown in our patient.

Our patient developed pulmonary embolism following streptokinase, probably due to embolization of a partially lysed clot which lost its adherence to the prosthetic valve. Such occurrences have been described, but these emboli (either pulmonary, or systemic, as in a left-sided prosthesis) are usually small and not of much long-term significance, as in our patient. Other potential complications of streptokinase therapy include allergic reactions and hemorrhages, but these did not occur in our patient.

Since the risk of thrombotic complications is high in the tricuspid position, the use of a porcine xenograft may be better suited for tricuspid valve replacement. In patients with a mechanical tricuspid prosthesis, in addition to warfarin, the use of dipyridamole to decrease platelet adhesiveness may be advisable.

REFERENCES