

Tricuspid Valve Replacement in the Presence of an Endocardial Pacemaker Electrode

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A technique is described to implant a mechanical tricuspid prosthesis in a patient with a previously implanted endocardial pacemaker lead. The lead was allowed to pass between two pledgeted sutures placed in the area of the septal leaflet. The patient

remains asymptomatic, with a functioning pacemaker system at one year following the procedure.

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The placement of an endocardial ventricular pacemaker lead entails passing the electrode through the tricuspid valve. Several cases of ventricular pacing in the presence of a tricuspid annuloplasty ring or prosthesis have been reported (1-3). However, the problem of implanting a tricuspid prosthesis in the presence of an endocardial ventricular lead has not been addressed.

Case report

A 65-year-old woman was admitted to the authors' hospital for elective surgery with the diagnosis of mitral stenosis and massive tricuspid insufficiency. Her previous cardiac history included a closed mitral commissurotomy 40 years ago and the implantation of a dual-chamber pacemaker (DDD) for sick sinus syndrome, four years previous to her admission. The patient underwent surgery through a median sternotomy. There were very dense adhesions from her previous cardiac procedure. Under cardiopulmonary bypass (CPB), the left atrium was opened and the mitral valve was seen to be severely stenotic with areas of calcification. The anterior leaflet was excised and the valve replaced with a mechanical tilting-disc prosthesis, preserving the posterior leaflet (4). After closing the left atrium, the right atrium was opened. There was structural involvement of the tricuspid valve with a fused

commissure. Both atrial and ventricular electrodes were firmly attached to the endocardium. An anterior commissurotomy followed by a Wooler annuloplasty were performed. Following discontinuation of the CPB, transesophageal echocardiography showed a normally functioning mitral prosthesis, but there was a mild residual tricuspid insufficiency with a transvalvular gradient of 10 mmHg. These findings prompted a revision of the tricuspid procedure. In view of the organic involvement of the valve, it was decided to replace it with a mechanical tilting-disc prosthesis. Pledgeted sutures were placed in the area of the septal leaflet. The pacemaker electrode was allowed to pass between two

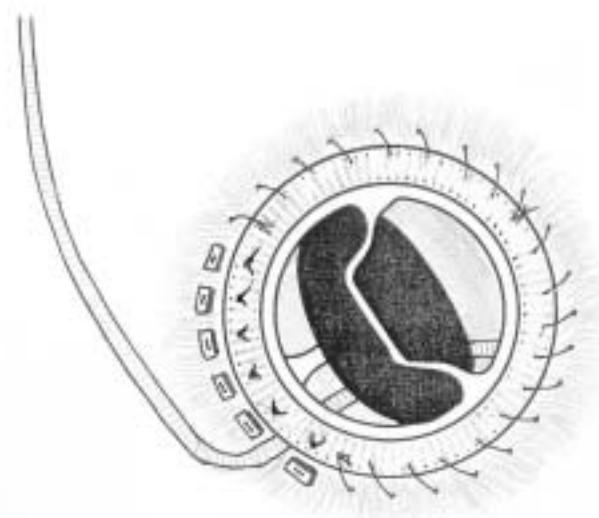


Figure 1: The pacemaker electrode passes between two pledgeted sutures placed in the area of the septal leaflet.

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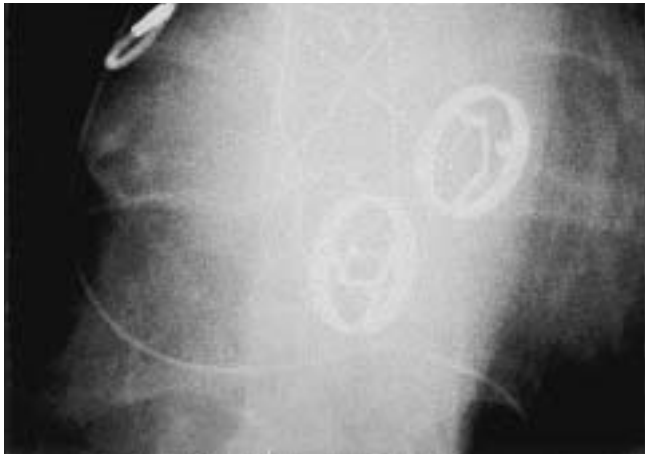


Figure 2: Chest X-radiography at one year after the procedure. The ventricular electrode describes a smooth curve and passes outside the metal housing of the tricuspid prosthesis. The atrial electrode can be seen at the top of the image.

of the sutures. The remainder of the prosthesis was sutured to the annulus using a continuous suture (Fig. 1). The patient made an uneventful recovery and was discharged from hospital. She was in atrial fibrillation, but the pacemaker was stimulating the ventricle. At one year after the procedure she remains asymptomatic, and the pacemaker has continued to function correctly, with the electrode showing a smooth, non-distorted curve (Fig. 2).

Discussion

The insertion of an endocardial pacemaker lead in the presence of a tricuspid prosthesis poses an important surgical challenge. Some series have estimated that up to 22% of patients with a tricuspid prosthesis will require permanent cardiac pacing (5,6). For this reason, the placement of an epicardial pacemaker electrode at the time of tricuspid valve replacement is advisable. There are two reported cases of the passage of a ventricular lead through a ball prosthesis (1,7) but, in general, the use of an electrode placed in the coronary sinus or a cardiac vein has been recommended (8-10). In the present case, there were few alternatives to the method described. Implantation of an epicardial electrode would have allowed ventricular pacing, but access to both ventricles was limited by adhesions from a previous cardiac procedure. Removal of the transvenous lead would have required it to be freed

from the embedding endocardium, and the possibility of pacing the ventricle with a newly implanted lead in a cardiac vein was uncertain. Placing the electrode between two sutures was straightforward, and did not affect disc opening or coaptation with the tricuspid annulus. The curve of the electrode was not distorted and the pacemaker continued to function properly. The technique described herein may be useful to surgeons faced with a similar situation.

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