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Bicuspidization of the Tricuspid Valve for the Treatment of Posterior Leaflet Endocarditis: A Case Report

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ABSTRACT

Patients who require surgical therapy for the treatment of tricuspid valve regurgitation can avoid undergoing tricuspid valve replacement if valve-sparing repair techniques are employed. Tricuspid valvular endocarditis frequently requires valvectomy, leaving the right side of the heart and pulmonary system vulnerable to unregulated blood flow. We present a case of complete posterior leaflet excision and plication of the involved portion of the tricuspid annulus, which resulted in "bicuspidization" of the valve, for the treatment of tricuspid valve endocarditis localized to the posterior leaflet.

INTRODUCTION

In patients who require surgical therapy for the treatment of tricuspid valve regurgitation, techniques for mitral valve repair can be applied to the tricuspid valve, avoiding replacement of the valve [Shemin 2003]. Given that tricuspid valve endocarditis frequently occurs in intravenous drug abusers, long-term compliance with coumadin therapy is often problematic, precluding the use of a mechanical prosthesis in a large proportion of these patients. Moreover, while bioprosthetic valves are susceptible to structural valve deterioration, tricuspid valvectomy leaves the right side of the heart and pulmonary system vulnerable to unregulated blood flow. These factors indicate that extirpation of all gross infection combined with repair of the tricuspid valve is the treatment of choice in most surgical candidates. When both native tricuspid valve endocarditis and vegetation are present, the involved structures of the valve, annulus, and chordae should be excised when possible. We present a case in which complete excision and plication of the diseased posterior leaflet of the tricuspid annulus resulted in "bicuspidization" of the valve and effectively treated tricuspid valve endocarditis localized to the posterior leaflet.

CASE REPORT

A 44-year-old man presented with sepsis and shoulder pain. His past medical history was significant for hypertension, insulin-dependent diabetes mellitus, congestive heart failure, chronic obstructive pulmonary disease, and depression. Additionally, his past medical history was complicated by end-stage renal disease that required multiple indwelling catheters for dialysis, which currently resulted in bacteremia. He had received antibiotics (during dialysis) prior to removal of his infected catheter, but blood cultures were persistently positive for methicillin-resistant *Staphylococcus aureus* despite appropriate antibiotic therapy. He also had an inferior vena cava filter recently placed for a deep vein thrombosis. During his stay, he had an episode of syncope and asystole that required intubation and resuscitation. Subsequently, a transesophageal echocardiogram (TEE) revealed both a thrombus in the right atrium adjacent to the junction of the superior vena cava and a large mobile vegetation associated with moderate tricuspid regurgitation (Figure 1).

The patient underwent a tricuspid valve repair through a median sternotomy approach. Inspection of the right atrium

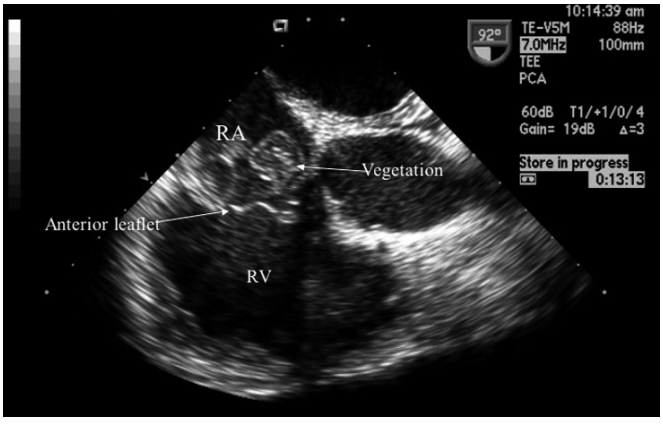

Figure 1. Preoperative transesophageal echocardiogram showing a large mobile vegetation. RV indicates right ventricle; RA, right atrium.

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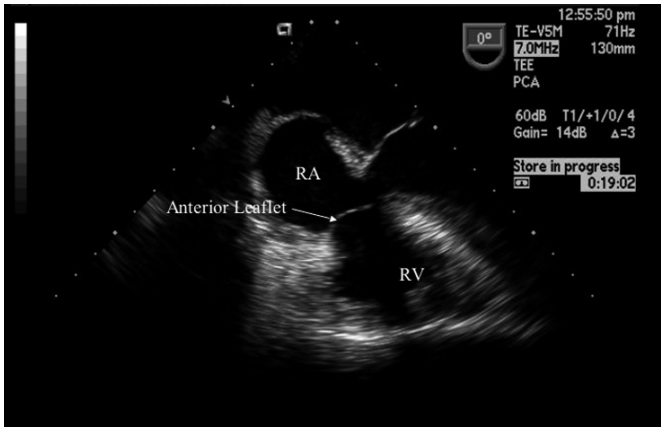

Figure 2. Postoperative transesophageal echocardiogram after resection of the posterior leaflet and associated vegetation, resulting in a bicuspid valve.

on cardiopulmonary bypass revealed a large organized thrombus, measuring approximately 8 mm in diameter and 3 cm in length, extending from the orifice of the superior vena cava into the right atrium. This thrombus was excised. A large mobile vegetation was attached to the posterior leaflet of the tricuspid valve, involving the subvalvular chordae tendinae. The posterior leaflet with involved chordae was resected with the attached vegetation en bloc. The annulus was debrided, as there was some inflammatory debris along the annulus, particularly along the posterior portion of the annulus at the junction of the posterior and septal leaflets.

After the posterior leaflet was excised, a total of 3 pledgeted #2-0 ethibond sutures were used to plicate the tricuspid annulus along this excised segment. Care was taken to avoid placing sutures in the vicinity of the atrioventricular node. The "bicuspidization" procedure effectively created a bicuspid valve from the normally tricuspid valve with a commensurate reduction in the overall annular diameter and circumference. An immediate postoperative TEE revealed excellent competency of the neobicuspid valve (Figure 2).

The postoperative course was complicated by complete heart block that resolved on day 7. A peritoneal dialysis catheter was placed for management of his end-stage renal disease. He completed a 6-week course of vancomycin and currently has no signs of residual or recurrent infection.

DISCUSSION

Since plication of the posterior leaflet has been described to decrease annular diameter [Shemin 2003], complete excision of the posterior leaflet for the treatment of endocarditis is an extension of this technique. Tricuspid valve "recycling" with partial excision of the anterior leaflet with pericardial patching resulted in successful sterilization of the tricuspid valve [Allen 1991]. Our experience allowed us to resect the entire posterior leaflet without need for a pericardial patch or valvular ring introduction. Annular plication was employed to decrease the annular size, complete the annuloplasty, and restore valvular competence. This tricuspid valve repair allowed our patient to retain his native valve and avoid coumadin therapy, prosthetic valve degeneration, or infection and the problematic hemodynamic effects of tricuspid valvectomy.

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