



Successful Treatment of Tricuspid Valve Endocarditis with Reconstruction of Leaflets Using Bovine Pericardium

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Surgical treatments for tricuspid valve endocarditis include vegetectomy, valvectomy, valve repair, and valve replacement using cardiopulmonary bypass. Here, we present a case of tricuspid valve endocarditis in a heroin user with intractable infection, multiple pulmonary emboli, and a large vegetation after 2 months of antibiotic therapy. We reconstructed the leaflets with bovine pericardium and repaired the valve with the 'clover technique' to preserve the integrity of the tricuspid valve. This technique was described clinically by Alfieri in 2003, and was used to correct posttraumatic tricuspid regurgitation. An echocardiographic study was performed after the cardiopulmonary bypass, at discharge, and at follow-up. It revealed diminished tricuspid regurgitation from a severe preoperative degree to a minimal degree postoperatively and the patient recovered uneventfully.

Key words: clover technique, tricuspid valve endocarditis

INTRODUCTION

The incidence of tricuspid valve endocarditis is strongly related to drug use. Tricuspid valve endocarditis can be treated medically, because the heart is less susceptible to injury from tricuspid regurgitation and pulmonary embolization than from lesions associated with left-sided endocarditis. Severe congestive heart failure and persistent sepsis are two major indications for surgery. Here, we report our experience with the reconstruction of leaflets using bovine pericardium. The valve was repaired by stitching together the middle points of the free edges of the tricuspid leaflets, producing a clover-shaped valve, to preserve the integrity of the tricuspid valve¹. This method was performed successfully and the patient recovered uneventfully.

Case Report

A 39-year-old woman experienced intermittent fever

and exertional dyspnea for 3 months. She was admitted to our hospital with hemoptysis and high fever. Before her admission, infective endocarditis of the tricuspid valve had been diagnosed at another medical center in July 2005, and medical treatment had been prescribed for 2 months. Heroin addiction for 4-5 years was reported by the patient. The laboratory results on admission included a white cell count of 13400/ μ L and a serum C-reactive protein concentration of 18.54 mg/dl. Echocardiography demonstrated one vegetation (0.8×3.0 cm²) on the tricuspid valve, with severe tricuspid regurgitation (Fig. 1). A chest roentgenogram showed some small opaque lesions over the bilateral lung fields. A blood culture grew methicillin-sensitive *Staphylococcus aureus*. The New York Heart Association functional category was class III-IV perioperatively. Surgery was performed on September 30, 2005, because of uncontrolled sepsis after antibiotic treatment.

The patient underwent a median sternotomy and was placed on a cardiopulmonary bypass using routine aortobicaaval cannulation. After cardioplegic arrest, a right transverse atriotomy allowed examination of the tricuspid valve. The tricuspid valve and annulus were destroyed at the level of the anterior and septal leaflets. After complete resection of the destroyed leaflets, the leaflets were reconstructed with bovine pericardium and stitched together at the middle points of the free edges of tricuspid leaflets, which produced a clover-shaped valve (Fig. 2). Tricuspid valve annuloplasty was performed using the DeVega

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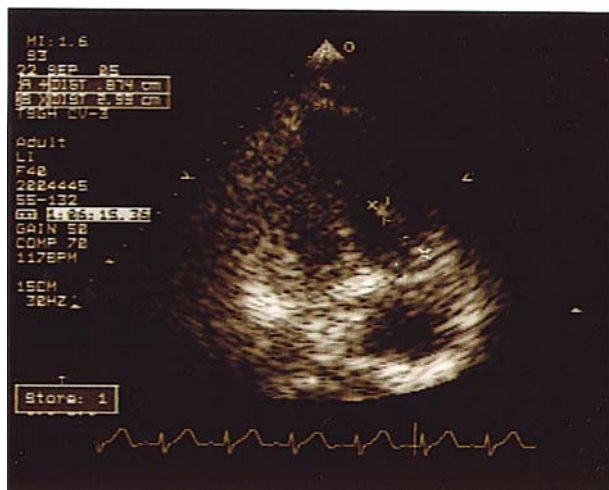


Fig. 1 Echocardiography revealed one vegetation (0.8×3.0 cm²) on the tricuspid valve with severe tricuspid regurgitation.

method. Following the correction, saline was injected into the right ventricle to test the valvular competence.

During rewarming, the tricuspid valve function was also evaluated by transesophageal echocardiography, which showed moderate to severe tricuspid regurgitation.

The patient was discharge with moderate tricuspid regurgitation after 4 weeks of antibiotic treatment. Three months after surgery, she was in good health with no signs of valve infection or heart failure. Echocardiography showed mild tricuspid regurgitation and good ventricular contractility.

DISCUSSION

Acute infective endocarditis of the tricuspid valve is a rare entity and accounts for only 3%-14% of all valve infections. The incidence of tricuspid valve endocarditis is strongly related to intravenous drug abuser². Tricuspid valve lesions can be treated medically, because the heart is less susceptible to injury from tricuspid regurgitation and pulmonary embolization than from lesions associated with left-sided endocarditis. Severe congestive heart failure and persistent sepsis are two major indications for surgery.

Surgical treatments for tricuspid valve endocarditis include vegetectomy, valvectomy, valve repair, and valve replacement using cardiopulmonary bypass. Successful treatment of tricuspid endocarditis should include the excision of all infected tissue and the restoration of valvular competence. Arbulo and associates³ proposed tricuspid valve excision without replacement. This procedure al-

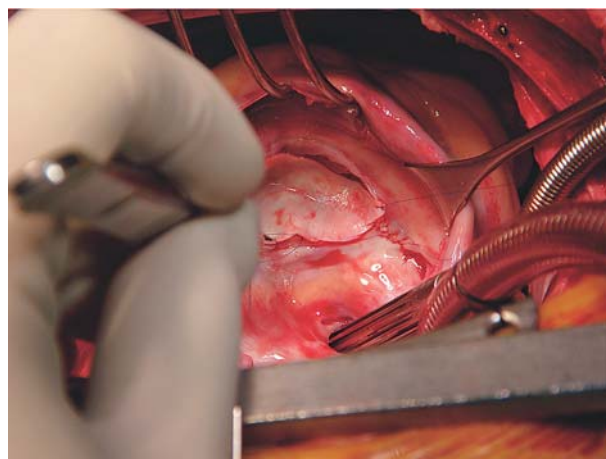


Fig. 2 The tricuspid valve leaflets were reconstructed with bovine pericardium, and the middle points of the free edges of the leaflets were stitched together, producing a clover-shaped valve.

lows the complete removal of infected tissues, and the absence of a tricuspid valve is tolerated well by patients with normal pulmonary artery pressure. This procedure is especially indicated for patients addicted to intravenous drugs, in whom the complete absence of a tricuspid valve precludes any recurrence of infection. However, tricuspid valve excision without replacement is contraindicated in patients with left-sided endocarditis and high left atrial pressure⁴. Tricuspid valve replacement may be another therapeutic option but it has a high incidence of complications, including reinfection, heart block, prosthetic thrombosis, and poor hemodynamic performance⁵. Patients with tricuspid valve endocarditis have low compliance rates with regard to long-term anticoagulation, often because they are elderly and have a pacemaker or because they are addicted to intravenous drugs. The best immediate and short-term solution to the problem of tricuspid valve endocarditis may be the generous excision of valvular tissue when it has vegetations or the reconstruction of the native valve without the use of prosthetic material⁶.

We performed this operation to reconstruct the leaflets using bovine pericardium and the 'clover technique' to preserve the integrity of the tricuspid valve. The technique consists of adequate debridement of the infected leaflets, reconstruction of the leaflets with bovine pericardium, and stitching together the middle points of the free edges of the tricuspid leaflets, producing a clover-shaped valve. Annuloplasty was performed using the DeVega method to correct annular dilatation and deformation and to stabilize the repair, preventing further dilatation. Initial moderate

insufficiency is tolerated well by the patient and valvular competence generally improves over time. Parenteral antibiotic therapy was continued for 4 weeks postoperatively. Residual regurgitation subsides with the resolution of right ventricular volume overload. Therefore, we regard this method of tricuspid valve reconstruction and valve repair to be an alternative surgical treatment for tricuspid valve endocarditis.

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