How-to-do-it

Neo-chordae length adjustment in mitral valve repair

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Abstract

Appropriate length adjustment of neo-chordae using PTFE sutures for mitral valve repair in degenerative valve disease has a crucial impact on both early and late outcomes of the repair. Herein we describe an adjuvant approach to facilitate the length adjustment.

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1. Introduction

One of the crucial aspects in repairing anterior prolapsus of the mitral valve by a PTFE conduit is to achieve proper length of the neo-chordae. This method has first been mentioned by David and colleagues [1,2]. Thereafter several techniques have been advocated for length adjustment including chordal transfer with or without partial annuloplasty [3] and chordal shortening [4], and all have been described and applied successfully with a low operative mortality and minimum postoperative complications. We have adopted the technique which was described by David and colleagues [1,2] and devised a new approach in an attempt to ease the repair.

2. Technique

The mitral valve is approached via an incision made anterior to the right pulmonary veins. Before commencing the repair, the whole reconstructive procedure is planned by exploring and injecting cold saline into the left ventricular cavity. If necessary, posterior resection is initially performed. Thereafter, the PTFE sutures (W.L. Gore and Associates, Flagstaff, AZ, USA) are placed at the top of the papillary muscles using Teflon pledges and tied loosely. Both arms of all PTFE sutures are then passed through the rough zone of the prolapsed leaflet twice. The sutures are left untied. Three or five pledged Tevdek sutures with a figure of 8 are inserted for posterior annuloplasty without knotting. Two polypropylene stay sutures are then placed knotting just once to appose the kissing edges of the leaflets (Fig. 1). An indwelling line is inserted into the left ventricle across the mitral valve and saline is injected with a considerable pressure. As the leaflets dome out, each PTFE suture is tied up since the polypropylene sutures hold and prevent overprolapsing the leaflets (Fig. 2). Appropriate height of leaflets is easily estimated by this way and overzealous knotting is prevented by keeping both the left ventricle and leaflets distended under pressure. Then the sutures that were placed at the posterior annulus are tied up reducing posterior annular circumference. Valve competency is then checked once more and additional Tevdek sutures can be inserted at the posterior annulus if required. Peroperative transesophageal echocardiography with Doppler color flow mapping is performed at the end of the procedure and the

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repair is considered successful if less than moderate mitral regurgitation is present.

We had nine patients (seven male, two female) with a mean age of 46 ± 19 years (range 17—64 years). All patients were in New York Heart Association (NYHA) functional class 3 or 4 preoperatively. Associated procedures were coronary revascularization in three, aortic valve suspension in one, and tricuspid valve De Vega annuloplasty in two cases. Only one patient had mitral valve replacement due to unsuccessful repair. There was no in-hospital death. Mean follow-up period was 23.7 ± 12.8 months. All of them including patients with mitral valve replacement were in NYHA class 1 or 2.

3. Comment

Inserting stay sutures in our technique proved to be effective in simplifying the repair procedure. Previously reported methods could not retain the injected serum physiologic solution inside the ventricle, therefore the valve leaflets were partially domed without tension. Besides, the slippery nature of the PTFE sutures might as well permit overzealous knotting resulting in a corrupted repair. This little modification can easily be applied and if required, more than two stay sutures can also be inserted.

Early results of PTFE suture implantation with posterior plication using pledged sutures seems to be acceptable for degenerative mitral valve regurgitation of different subtypes. Long-term results of controlled clinical studies with greater number of patients are required in order to validate the clinical usefulness of this technique in the future.

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References