

A Complex Mitral Valve Reconstruction: A Case Report

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ABSTRACT

Several techniques are currently in use for mitral valve reconstruction. We report a mitral repair case in which the use of a combination of different surgical techniques resulted in the necessary correction. A 47-year-old woman underwent surgical intervention to treat severe mitral valve insufficiency due to A1/A2/A3 and P2 prolapsed valve tissue. A combination of quadrangular resection, sliding leaflet, single chordal transposition, "flip-over" leaflet, and ring annuloplasty techniques were applied, and postsurgical correct valve function was documented by results of a left ventricular saline filling test and transesophageal echocardiography control. Complex mitral valve repairing techniques can be combined to reestablish valvular function.

INTRODUCTION

Repair of the mitral valve for correction of insufficiency is routinely practiced today with very good results [Galloway 1998, Gillinov 2001]. Different surgical techniques are being described and used for repairing a pathologic mitral valve. Annuloplasty ring, commissurotomy, quadrangular resection, sliding leaflet, single or multiple chordal transposition, artificial chordal implantation, chordal shortening, "flip-over" leaflet, papillary muscle splitting, and repositioning are some of the techniques in use [Carpentier 1983]. After identification of the specific anatomic and functional valve alterations, each of these techniques can be applied alone or in combination with other techniques.

CASE REPORT

A 47-year-old woman with previously diagnosed mitral valve dystrophy and associated apex systolic murmur required hospitalization and treatment in December 2001 for acute endocarditis due to *Streptococcus oralis* infection. During that hospitalization, transthoracic echocardiography control docu-

mented severe mitral regurgitation. The patient completely recovered without sequelae. Transesophageal echocardiography documented abundant prolapsing tissue in A1/A2/A3 and P2 segments. No signs of active endocarditis were observed. Cardiac function was normal.

Surgical treatment was performed in June 2002.

Through standard median sternotomy, cardiopulmonary bypass and moderate hypothermia were instituted. Cardiac arrest was obtained and maintained by continuous antero-grade hematic cold cardioplegia. The left atrial cavity was exposed by a superior transseptal approach (Guiraudon's technique). On inspection, the mitral valve was found to be insufficient, and after careful examination the sequent anatomical alterations were identified. The annulus was slightly dilated. The posterior leaflet was abundant and prolapsing mainly at the P2 segment. The anterior leaflet was prolapsing in the A1, A2, and A3 segments, and chordae were elongated, especially under the A1 segment. Papillary muscles were normal.

First, posterior leaflet prolapse repair was started by quadrangular resection of the P2 segment without detaching it completely from its subvalvular system. The posterior annulus was plicated with 4 interrupted prolene 5-0 sutures. Sliding was performed by detaching the 2 remaining segments, P1 and P3, from the annulus up almost to the commissures. The detached leaflets were then reapproximated to the annulus and to each other with continuous prolene 5-0 sutures.

The detached P2 segment was used for repairing the anterior mitral leaflet with the flip-over leaflet technique. The P2 was carefully examined and cut to obtain a quadrangular piece of leaflet while maintaining the subvalvular secondary chordae apparatus, to be attached underneath the prolapsing A2 with interrupted 6-0 prolene sutures.

Then, 2 single chordae were prepared separately from under the resected P2 segment and attached at the level of A1 and A3 segments with single interrupted 6-0 prolene sutures.

Last, a standard complete semirigid annuloplasty ring no. 26 (Carpentier-Edwards Physio Annuloplasty Ring, model 4450; Edwards Lifesciences, Irvine, CA, USA) was applied and fixed with interrupted Ti-cron 3-0 U stitches.

An intraoperative ventricular water-filling test was performed to check mitral valve continence. The observed result was satisfactory. The transesophageal echocardiography results confirmed the mitral valve's correct function; neither insufficiency nor systolic anterior motion was observed, and the operation was completed without any complication.

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Transthoracic echocardiography results at 6 weeks follow-up documented trivial mitral insufficiency.

DISCUSSION

Complex mitral valve repairing techniques can be combined to reestablish valvular function. Mitral valve complex anatomy and function alterations due to pathologic tissue changes necessitate precise preoperative and intraoperative evaluation. Each component of the mitral valve should be carefully examined and evaluated. At different levels of the valve, several anatomic lesions are involved and each must be

identified, addressing the right repair technique combination for mitral reconstruction.

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