Transaortic repair for the moderate functional mitral regurgitation

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As many as 75% of patients undergoing aortic valve replacement also have functional mitral regurgitation (FMR). How to deal with concomitant moderate FMR remains controversial. Repar of moderate mitral regurgitation with a prosthetic ring may lead to physiologic annular dynamic inhibition and transmitral flow influence, costing more in operative time and medical expenses. If left alone, however, moderate FMR will affect cardiac function and delay surgical rehabilitation. Residual regurgitation may deteriorate, necessitating reoperation. Fortunately, these problems can be solved by our technique when the concomitant moderate FMR is repaired through a transaortic approach.

CLINICAL SUMMARY

A total of 25 patients undergoing aortic valve or aortic root procedures underwent transaortic mitral valve repair from January 2006 to June 2011. There were 18 male (72%) and 7 female (28%) patients, with a mean age of 57.9 ± 9.6 years. All those patients could be subclassified as having type I mitral regurgitation according to the Carpentier classification. The causes of aortic valve disease can be classified as follows: degenerative (14 patients), rheumatic (4 patients), 2-leaflet abnormality (2 patients), and Marfan syndrome (5 patients). The predominant aortic valve diseases were aortic regurgitation in 18 patients, aortic stenosis 13 in patients, and combined aortic regurgitation and aortic stenosis in 4 patients.

Intraoperative transesophageal echocardiography (TEE) confirmed the previous findings. Conventional cardiopulmonary bypass was established through a median sternotomy, and peripheral cardiopulmonary bypass through the femoral artery was established through a transverse parasternal incision over the third intercostal space. The mitral valve was approached through the incision of the anterior wall of the ascending aorta or aortic root. Leaflet, annulus, chordae, and papillary muscles were exposed after resection of the aortic valve. There was no organic disease of the mitral valve. We used 2-0 polypropylene (Prolene; Ethicon Endo-Surgery, Inc, Somerville, NJ) mattress suture with 2 pledgets from posterior annulus to anterior annulus at the 2 commissural areas (Figure 1). This technique took small anchoring suture bites of the anterior annulus and progressively took larger bites along the adjacent posterior annulus, then the length of the posterior annulus significantly decreased and the posterior annulus came close to the anterior annulus (Figure 2).

In all, 16 aortic valve replacement procedures, 8 Bentall procedures, and 1 Wheat procedure were then performed. Concomitant procedures included 2 bypass procedures, 1 ligation of persistent ductus arteriosus, 4 maze IV procedures, and 5 tricuspid valve repair procedures. TEE was carried out before the end of each procedure.

Lessened mild residual regurgitation was found in 2 patients through TEE. No mitral valve regurgitation or stenosis was found in the other 23 patients. Operative times for cardiopulmonary bypass and aortic crossclamp were 75.9 ± 20.4 minutes and 56.5 ± 16.4 minutes, respectively. No deaths occurred in this population. The left ventricular diastolic diameter decreased from 57.8 ± 6.7 mm to 52.8 ± 6.5 mm. The ejection fraction was 46.8% ± 5.0%. There was no significant variation in diameter of left atrium, mitral valve orifice area, mean gradient pressure, or peak gradient pressure between the left atrium and left ventricle. The results before discharge of mitral valve repair, according to TEE and transthoracic echocardiography, were the same.

All patients were followed up for a mean interval of 50.4 ± 25.3 months. There were 3 patients who had recurrence or aggravation of regurgitation. One had mild residual regurgitation, which developed to moderate...
regurgitation at the ninth month after the procedure. The other 2 patients had recurrence of mild regurgitation at the third and 30th months. Freedom from mitral regurgitation was 86.9%

DISCUSSION

Suture annuloplasty can maintain the physiologic motion and spatial structure of the mitral annulus without prosthetic ring. Commissural suture, a type of suture annuloplasty, can effectively recover the mitral valve function by decreasing the length of the posterior annulus. Our data showed good results of the commissural suture for moderate FMR. We could get excellent mitral valve exposure through the transaortic approach when the diameter of aortic annulus was enlarged. A retractor was used to withdraw the chordae to reveal the commissural area and avoid entanglement. Commissural suture performed through the transaortic approach was just as easy as through a routine approach. Nevertheless, the technique requires experience when executing it on an aortic annulus of normal or small size diameter. Transaortic repair was suitable, especially when upper median sternotomy or transverse parasternal incision over the third intercostal space was used. The advantages included no bleeding from an atrial incision and no extensive release of adhesions in reoperations. It is thus safe, effective, and convenient to repair moderate FMR by commissural suture through transaortic approach when the procedure of aortic valve or aortic root replacement is performed.

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References


An alternative technique for surgical repair of pulmonary dissection

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Pulmonary artery dissection (PAD) is a rare but life-threatening event that usually occurs with other congenital cardiac defects or as a complication of chronic pulmonary arterial hypertension. Other causes of PAD include connective tissue disorders, right heart endocarditis, amyloidosis, trauma, and severe atherosclerosis. Only few cases of PAD treated surgically have been reported in the literature, and no definitive approach has been established. We describe an alternative technique for surgical repair of PAD.

CLINICAL SUMMARY

A 46-year-old patient with Ehlers-Danlos syndrome who had undergone Bentall composite aortic root replacement for type A aortic dissection 10 years previously was...