Mitral Valve Repair with Extensive Resection of the Anterior Leaflet for Regurgitation Due to Barlow’s Disease

Report of a Case

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SUMMARY

We recently performed mitral valve repair for a case of mitral regurgitation due to Barlow’s disease, which is relatively rare in Japan. Both the anterior and posterior leaflets were affected by advanced myxomatous change, and appeared markedly thickened and redundant. Although extensive resection of the anterior leaflet is not a generally accepted method, nearly one fourth of the anterior leaflet was resected in this case. Now, at 36 months after the operation, there is only trivial regurgitation and the patient is doing well and without symptoms. We believe that extensive resection of the anterior leaflet can be a useful treatment for repair of a redundant anterior leaflet with excess tissue. (Jpn Heart J 1997; 38: 865–868)

Key words: Mitral valve repair, Mitral valve regurgitation, Myxoid degeneration, Barlow’s disease

PURE mitral regurgitation due to Barlow’s disease, or billowing mitral valve, is relatively rare in Japan. We recently encountered a typical case in which both the anterior and posterior mitral valve leaflets were affected by advanced myxomatous change. Here we report our experience of mitral valve repair in a patient who underwent extensive resection of the anterior leaflet.

CASE REPORT

A 52-year-old man with mitral regurgitation was admitted to our hospital. He had no history of rheumatic fever or infective endocarditis. A grade 3/6 late systolic murmur was audible around the apex, and an electrocardiogram showed
atrial fibrillation. A cardiac catheterization study revealed a slightly elevated v wave, a pulmonary capillary wedge pressure of 14 mmHg, mildly elevated left ventricular end-diastolic pressure and a decreased cardiac output (cardiac index = 2.0). An enlarged left ventricle with moderate to severe mitral regurgitation was observed on angiography. Echocardiography showed severe prolapse of both the anterior and posterior mitral leaflets, which appeared markedly thickened and redundant (Figure 1). This was thought to correspond to a type II valve, according to Carpentier’s classification.3)

The patient underwent a median sternotomy, and standard cardiopulmonary bypass was established. Through a transseptal superior approach9 the mitral valve was exposed and carefully examined (Figure 2). The mitral valve annulus was moderately enlarged. There were no torn chordae, but two of them were slightly elongated. First, quadrangular resection of the posteromedial scallop of the posterior leaflet was performed and the cut edges were approximated with 5–0 monofilament interrupted sutures. Then, triangular resection of almost one fourth of the anterior leaflet was performed and the defect was repaired with 5–0 monofilament sutures. As an artificial chorda, 5–0 expanded polytetrafluoroethylene suture was placed to connect the edge of the anterior leaflet with the head of the posterior papillary muscle. The repair was evaluated using Spencer’s method.5) There was residual regurgitation from around the medial commissure, which necessitated Kay’s annuloplasty at the anterior commissure.
This reduced the regurgitation markedly. No prosthetic ring was implanted. Transesophageal echocardiography after discontinuation of cardiopulmonary bypass demonstrated satisfactory competence of the valve.

At thirty-six months after the operation, the patient underwent echocardiographic and hemodynamic studies. Transthoracic echocardiography showed trivial mitral regurgitation and a mitral valve area of 2.3 cm². No systolic anterior motion of the mitral valve was seen. The cardiac index was increased to 2.2 l/min/m². Although the patient had been in sinus rhythm since the operation, warfarin sodium was administered during the first twelve months to prevent clot formation on the suture line of the valve before endothelialization.6) No thromboembolic complication occurred.

**DISCUSSION**

Mitral regurgitation due to a billowing mitral valve, as described by Barlow, is relatively rare in Japan. According to Carpentier and colleagues,7) the gross appearance of the valve is characterized by redundant, thickened, and opaque leaflets with excess tissue. The basic pathological condition is myxoid degeneration. It is completely different from the smooth, thin, and translucent valve seen in cases of fibroelastic deficiency.

Valve reconstructive surgery is feasible in most patients with a myxomatous mitral valve.3) In comparison with mitral valve replacement,6,8-10) mitral valve repair has the advantage of preserving left ventricular function as well as obviating the need for anticoagulation therapy, and is associated with low morbidity and mortality. Prolapse of the anterior leaflet, especially generalized prolapse together with the posterior leaflet, as in the present case, is associated with a high risk of reoperation.11,12) While prolapse of the posterior leaflet can be treated by
quadrangular resection of the prolapsed leaflet in most cases, prolapse of the anterior leaflet may require many different repair techniques. The anterior leaflet of the mitral valve is attached directly to the aortic wall, and the fibrous mitral annulus is absent in that area, unlike the posterior portion. Preservation of anterior leaflet flexibility and mobility is important for correct mitral valve function. Therefore, it is widely accepted that the extent of resection of the anterior leaflet should be limited to within 15%, and that other procedures should be performed, if necessary.

In the present case, however, the prolapse of the anterior leaflet was not due to elongated or ruptured chordae, but mainly to a markedly redundant leaflet with excess tissue. This made it possible to resect almost one fourth of the anterior leaflet, giving good coaptation of the anterior and posterior leaflets and leaving no residual regurgitation. Although the mitral orifice became slightly stenotic, the patient is now doing well without symptoms. We therefore consider that extensive resection of the anterior leaflet can be a useful treatment for repair of a redundant anterior leaflet with excess tissue.

REFERENCES