Mitral Regurgitation With an Isolated Anterior Mitral Leaflet Cleft

A Case Report

Kiyohiro Oshima, MD; Toru Takahashi, MD; Yasushi Sato, MD; Jun Mohara, MD; Susumu Ishikawa, MD; Yasuo Morishita, MD

A 20-year-old man was admitted to hospital because of general fatigue during exercise. He had had a heart murmur since the age of 6 years. Echocardiography showed severe mitral regurgitation (MR, IV°), probably caused by an anterior leaflet cleft or tendon rupture. During surgery, a cleft measuring 9 mm in length was found in the center of the anterior leaflet of the mitral valve. The cleft was closed directly, together with annuloplasty using the bilateral Kay's method. A Cosgrove ring (32 mm) was added because the mitral valve annulus was dilated. The patient's postoperative course was uneventful and echocardiography after surgery demonstrated no MR. An isolated cleft of the anterior mitral leaflet is a rare cause of MR and in this case, direct closure of the cleft with additional annuloplasty gave a good functional result. (Circ J 2005; 69: 114–115)

Key Words: Direct closure; Isolated anterior mitral leaflet cleft; Mitral regurgitation

Case Report

When the patient was 6 years old, a heart murmur was identified, but no other examinations were performed because there were no symptoms. When the patient was 12 years old, the heart murmur was confirmed to be still present and he visited hospital for additional investigation. Echocardiography revealed MR II°, and subsequently he was actively monitored. Since the age of 16 the patient experienced fatigue during exercise and he was admitted to hospital at the age of 20 for more precise testing. A systolic murmur (Levine III/VI) was audible at the apex, but there were no abnormal findings in the abdomen or the legs. There was no cardiomegaly (cardiothoracic ratio: 47%) and a chest roentgenogram showed clear lung fields. No arrhythmia was noted on electrocardiography. Echocardiography indicated a cleft in the anterior leaflet, causing severe MR (IV°) (Fig 1). Left ventricular function was good and the ejection fraction was 65%. Left ventricular cineangiography confirmed the severe MR.

After a pericardectomy through a median sternotomy, cardiopulmonary bypass was established with cannulation of both the vena cavae and the ascending aorta. Following cross-clamping of the aorta, the heart was arrested with antegrade blood cardioplegia. An incision was made in the left atrium parallel to the interatrial groove on the right side. A cleft measuring 9 mm was identified in the center of the anterior leaflet of the mitral valve. There were no other abnormal findings. The anterior leaflet around the cleft was relatively thick and firm. We sutured the entire length of

Fig 1. Echocardiography shows a cleft in the anterior leaflet (a, arrow), resulting in severe mitral regurgitation (b, arrow).
Isolated Anterior Mitral Leaflet Cleft

the cleft with 5-0 monofilament interrupted sutures (Fig 2). Annuloplasty using the bilateral Kay’s method was performed and a Cosgrove ring (32 mm) was installed because the mitral valve annulus was dilated to 36 mm. There was no regurgitation of the mitral valve in an intraoperative regurgitation test. Extracorporeal circulation and aorta-clamping times were 153 min and 104 min, respectively.

The postoperative course was uneventful and echocardiography 5 months after operation demonstrated trivial MR (Fig 3) and well-preserved left ventricular function (ejection fraction: 78%).

Discussion

An isolated cleft of the anterior mitral leaflet is usually associated with atrioventricular canal malformation and is therefore a rare cause of congenital MR.1,2 It has been reported in association with other cardiac anomalies such as secundum-type atrial septal defect, transposition of the great arteries, tricuspid atresia, pouches of the tricuspid valve, left ventricular—right atrial communication, coarctation of the aorta, ventricular septal defect, partial anomalous pulmonary venous connection and double outlet right ventricle;3,4 but there are only a few reports of the existence of this anomaly on its own.1,5,6

The clinical symptoms of an isolated cleft of the anterior mitral leaflet are basically those of MR and in cases of severe MR with no obvious mitral valve pathology and an intact atrial septum, this anomaly should be suspected.6 Echocardiography is useful in the preoperative diagnosis, although Mohanty et al reported that they could not establish the exact anatomic diagnosis of a cleft in preoperative echocardiographic examination of 4 patients.5 It is sometimes difficult to preoperatively diagnose a cleft in the anterior leaflet of the mitral valve because of the position, size and form of the cleft. In the present case, a cleft-like formation in the anterior leaflet was demonstrated by transthoracic echocardiography because the cleft was relatively large and positioned in the middle of the leaflet. It may be useful to also perform transesophageal echocardiography to confirm a diagnosis of a cleft of mitral valve if the results of transthoracic echocardiography are equivocal.

A cleft in the anterior leaflet of the mitral valve usually results in MR and can be surgically corrected with a good outcome in patients with moderate to severe MR. Direct suturing of the cleft restores the normal anatomy. Perier et al reported that a glutaraldehyde-fixed autologous pericardial patch was useful for cleft repair,2 but direct closure of the cleft without tension is possible and provides satisfactory results. If long-term regurgitation has caused annular dilatation, it can also be corrected by annuloplasty performed during the same procedure. In the present case, an additional annuloplasty using the bilateral Kay’s method and a Cosgrove ring provided satisfactory results with no postoperative MR.

References


Fig 2. Intraoperative findings. An arrow identifies the cleft of the anterior mitral leaflet. The cleft was closed directly.

Fig 3. Echocardiography 5 months after operation shows trivial mitral regurgitation (arrow).