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Case Report

Pericardial patch repair of the left atrioventricular valve in atrioventricular septal defect: long-term changes in the patch

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Abstract

A 31-year-old woman with partial atrioventricular septal defect underwent left atrioventricular valve (LAVV) replacement. Her initial repair was at 8 years of age. At 23 years of age, she underwent reoperation due to a combination of severe left ventricular outlet obstruction and moderate LAVV regurgitation. At that reoperation, she had a Dacron patch enlargement of the infundibular septum and repair of her LAVV with a xenograft (bovine) pericardial patch sutured into the superior bridging leaflet. LAVV replacement was required 8 years later because of valve insufficiency. There was a perforation in the patch with fibrosis, thickening due to pannus, and calcification of the pericardial tissue and the leaflet tissue, leading to stiffening of the tissue.

Keywords: Atrioventricular septal defect; Bovine pericardial patch; Mitral valve insufficiency and repair

1. Introduction

Patients with atrioventricular septal defects (AVSDs) are subject to the late complications of left atrioventricular valve (LAVV) insufficiency and of left ventricular outlet obstruction (LVOTO). We previously reported patch augmentation of the bridging leaflets using pericardium to repair the LAVV and to relieve the LVOTO [1]. Autologous pericardium (glutaraldehyde-treated) is the material of choice as it has excellent handling characteristics, durability, availability, and elastic properties [2]. If autologous pericardium is not available, allograft and xenograft pericardium may be used as a substitute. The postimplant morphological findings in pericardium placed in an AV valve have not been previously reported. We present the findings from a surgically excised LAVV in which a bovine pericardial patch was used to repair the bridging leaflet years earlier.

2. Case report

A 31-year-old female underwent LAVV (functionally the "mitral" valve) repair in 2003. She presented with palpitations, dizziness, headache, dyspnea, and orthopnea. Previous surgery included repair of a partial AVSD in 1981, and reoperation in 1995 for severe subaortic stenosis and moderate LAVV insufficiency that included augmentation of the LAVV with xenograft pericardium.

A 2D echocardiogram (2DE) prior to valve replacement showed normal left ventricular size and systolic function. The LAVV leaflets appeared prolapsed and thickened,

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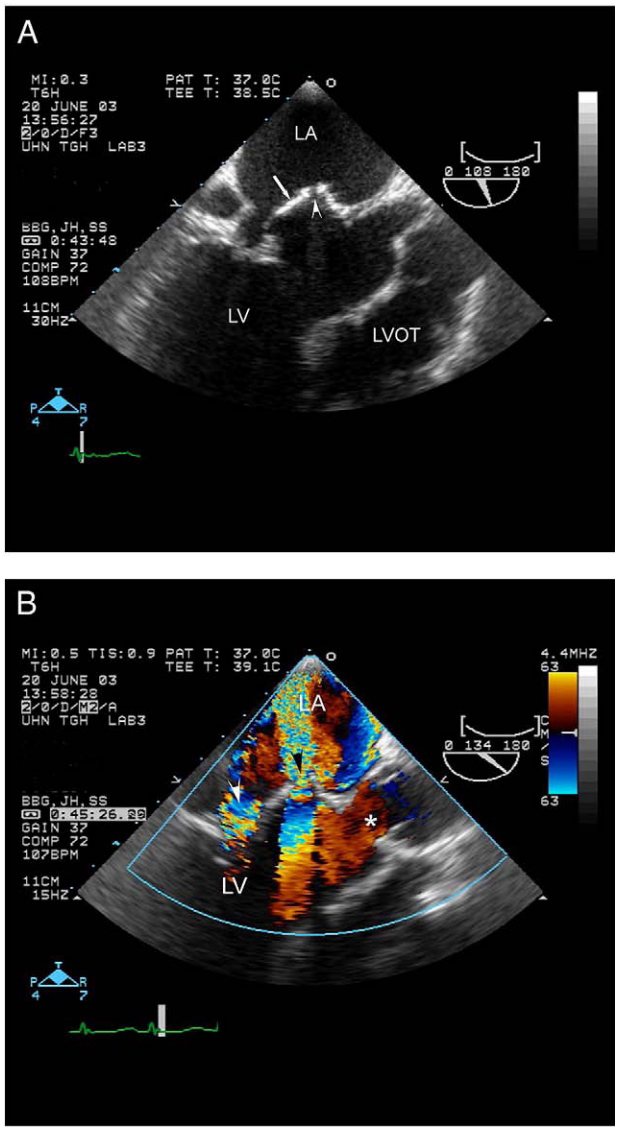

Fig. 1. Preoperative transesophageal echocardiography (TEE). (A) TEE demonstrating an LAVV (arrow) which is thickened, elongated, and prolapsing into the left atrium (LA). There is a visible gap in the leaflet body (arrowhead). The left ventricle (LV) and left ventricular outflow tract (LVOT) are seen. (B) TEE showing severe LAVV regurgitation within the leaflet body (black arrowhead) and a smaller jet of central regurgitation (white arrowhead) into the left atrium (LA). The left ventricle (LV) and an open aortic valve (*) are also seen.

leading to "mitral" regurgitation. There appeared to be a perforation in the superior bridging leaflet. The cusps of the aortic valve were thickened but were not dysfunctional. There was no residual LVOTO (Fig. 1).

The patient underwent replacement of the LAVV with a 29-mm St. Jude Medical bileaflet mechanical valve (St. Jude Medical, Minneapolis, MN). Postoperative 2DE demonstrated normal left ventricular size with moderate left ventricular systolic dysfunction (EF 20–39%) and a mean diastolic gradient of 3 mmHg. There was trace aortic regurgitation. The patient's postoperative course was uneventful and she remains in functional Class II during subsequent follow-up of 3 years.

3. Pathology and histology

Grossly, the LAVV was excised in its entirety, with two bridging leaflets and a third, posterior leaflet. The inferior and superior bridging leaflets measured 4.3×3.7 cm and 3.5×1.0 cm from side to side and base (close to the annulus) to free margin, respectively. The leaflets were 1.0 mm in thickness. The superior leaflet, containing the xenograft patch (measuring 3.0 mm in thickness), showed evidence of repair with a suture line demarcating the area of repair. Blue monofilament sutures are found at the junction between the pericardial patch and the leaflet tissue; here, the tissue was irregularly thickened and torn, suggesting either degenerative changes or previous infection. The posterior leaflet measured 0.9 cm in length and 0.6 cm from base to free margin (Fig. 2). Histologically, tissue from the superior

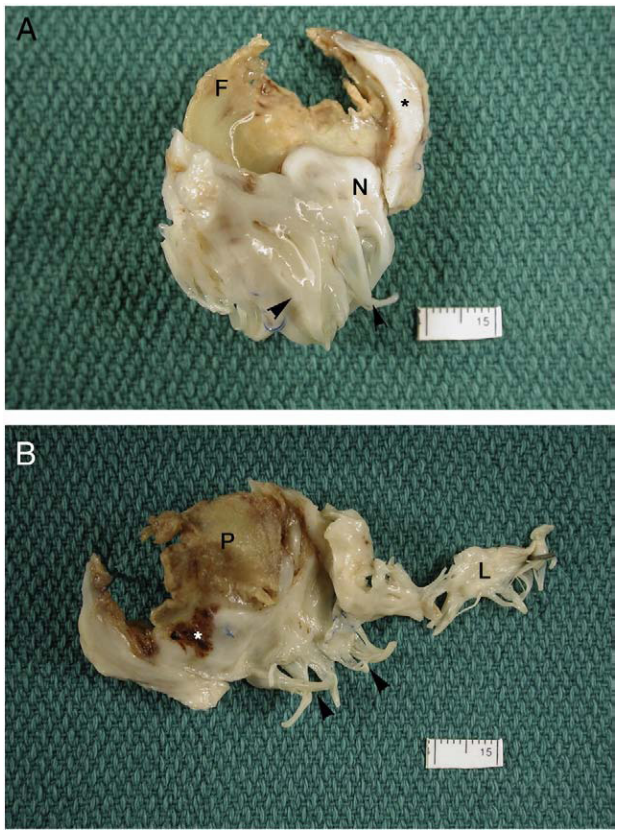

Fig. 2. Excised pericardial patched LAVV. (A) Nonflow surface (N) of the bridging inferior leaflet with attached chordae tendinae (arrowheads) measuring 4.3 cm from side to side and 3.7 cm from base to free margin. Flow surface (F) of the patched superior leaflet, which is markedly thickened (*) measuring 3.5 cm from side to side and 1.0 cm from base to free margin. (B) Flow surface of the repaired superior and inferior bridged leaflets with attachment to the bovine pericardial patch (P) and attached chordae tendinae (arrowheads). Right below the patch is an area of hemorrhage (*). The lateral leaflet (L) is attached.