

Iatrogenic Left Atrioventricular Fistula after Aortic Valve Re-replacement

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Left ventriculoatrial fistula is a very rare cardiac disorder. The case is reported of a male patient who was admitted to the authors' clinic with dyspnea and fatigue. The patient had an atrioventricular fistula between the left atrium and left ventricle, and had

Atrioventricular fistulas are uncommon occurrences (1,2), and in particular a left ventriculoatrial shunt is a very rare cardiac disorder (2). Repeated aortic valve replacement, especially in the case of pannus formation, may lead to iatrogenic injury (3). On examination, atrioventricular fistulas may be missed when using transthoracic echocardiography (TTE), but are identified clearly with transesophageal echocardiography (TEE) (2).

Case report

A 66-year-old male patient, who had a history of aortic valve re-replacement, was diagnosed with prosthetic aortic valve malfunction due to pannus formation in December 2003. He was subsequently referred to the authors' clinic with symptoms of dyspnea and fatigue about one year later. On physical examination, his blood pressure was 155/90 mmHg and the heart rate 88 beats/min. In the aortic region, the mechanical opening and closure sounds of the valve prosthesis were normal. In addition, a grade 3/6 systolic ejection murmur was heard at the left sternal border. A mild cardiomegaly was noted on chest X-radiography. The electrocardiogram exhibited negative T waves and 0.5 mm ST depression in the D1, aVL and precordial leads (V1-V6). Transthoracic echocardiography showed a normally functioning prosthetic aortic valve, a pre-

undergone aortic valve re-replacement for prosthesis malfunction about one year previously. The fistula was considered to be the result of iatrogenic injury related to valve re-replacement surgery.

The Journal of Heart Valve Disease 2005;14:697-698

served ejection fraction, a moderately enlarged left atrium, and left ventricular hypertrophy. Multiplane TEE demonstrated a left ventriculoatrial fistula that passed from the left ventricular outflow tract beneath the valve prosthesis to the left atrium (Fig. 1). The largest measurable fistula diameter was 0.56 cm. Transesophageal echocardiography with color-flow Doppler revealed a bright mosaic color jet of high velocity originating within the left ventricle and entering the left atrium (Fig. 1C). A 145-mmHg gradient was established by continuous-wave Doppler between the left ventricle and left atrium (Fig. 1D). The patient refused catheterization, and infective endocarditis was excluded according to the modified Duke criteria (4).

Discussion

A ventriculoatrial fistula is a rare disorder, with most occurrences between the left ventricle and right atrium (1,2,5,6). Fistulas of this type are usually the result of paravalvular abscess or a complication of myocardial infarction (2,7-9). Here, the case is reported of a patient with a left ventricular-left atrial shunt caused by complications after prosthetic aortic valve re-replacement. To the present authors' knowledge, this is the first reported case of this fistulous communication arising in this manner.

In the present patient, the fistula was visualized with TEE, but being subvalvular, it could not be seen with TTE (2,9). When the reason for postoperative murmur in the heart is not known, TEE may represent a valuable diagnostic tool in these cases.

Reoperation for prosthetic valve dysfunction has been associated with significant mortality and morbid-

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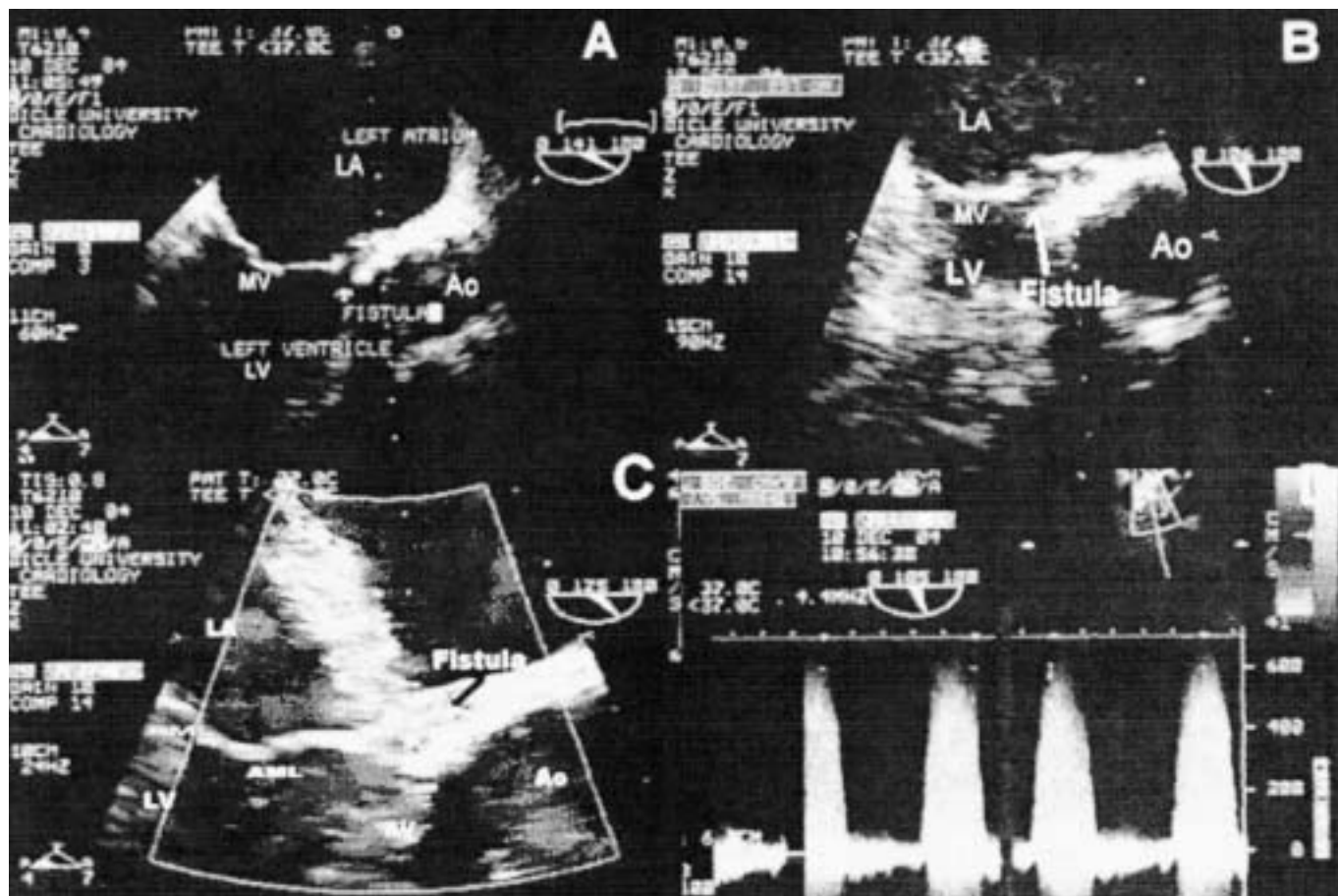


Figure 1: Transesophageal echocardiography showing an atrioventricular fistula (arrow) between the left ventricle (LV) and left atrium (LA). A-C) The fistula from the left ventricular outflow tract beneath the valve prosthesis to the left atrium is observed. C) Transesophageal echocardiogram with color-flow Doppler reveals a bright mosaic color jet of high velocity originating within the LV and entering the LA. D) A peak velocity of 6 m/s and a calculated peak gradient of 145 mmHg is demonstrated between the LV and LA, using continuous-wave Doppler. Ao: Aorta; AML: Anterior mitral leaflet; AV: Aortic valve; MV: Mitral valve; PML: Posterior mitral leaflet.

ity (3). Although complications such as thrombosis, embolism, bleeding, obstruction and endocarditis may occur after prosthetic valve surgery, fistulas may also be encountered on rare occasions (1-3). Repeated aortic valve replacement, particularly in the case of pannus formation, may lead to iatrogenic injury (3). In the present patient, the fistula was found at about one year after aortic valve re-replacement, and was a left-to-left shunt. This situation especially leads to left atrial volume and pressure overload. As treatment, an Amplatzer duct occluder may be used to close the fistulous tract (10).

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