Mitral valve ring dehiscence with an aorta–left atrial fistula

Davinder S. Jassala,*, Tomas G. Neilana, Umaima Fatimab, Godtfred Holmvangb, Arvind Agnihotric, Igor Palaciosd, Danita M. Yoergera

a Cardiac Ultrasound Laboratory, Cardiology Division, Massachusetts General Hospital, VBK-508, 55 Fruit Street, Boston, MA 02114, USA
b Cardiac MRI, Department of Radiology, Massachusetts General Hospital, Boston, MA, USA
c Cardiac Surgery Division, Massachusetts General Hospital, Boston, MA, USA
d Cardiac Catheterization Laboratory, Cardiology Division, Massachusetts General Hospital, Boston, MA, USA

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Abstract In an era with the increasing use of various imaging modalities including echocardiography, ventriculography and cardiac magnetic resonance (CMR) imaging, one must be aware of the limitations of each discipline. We report a case of an individual who presented with both a partial dehiscence of a mitral valve annuloplasty ring and an aorta–left atrium fistula following surgical management of infective endocarditis that was correctly identified using transesophageal echocardiographic imaging. © 2006 The European Society of Cardiology. Published by Elsevier Ltd. All rights reserved.

Case summary

A 59-year-old male with mitral valve endocarditis secondary to Streptococcus viridans presented with worsening heart failure symptoms four months after completing a full course of antibiotics. He underwent a complex mitral valve reconstruction procedure with quadrangular resection of the affected posterior cleft leaflet and reduction annuloplasty with a 28 mm partial Cosgrove band. There was no evidence of recurrent infection at the time of the surgery.

Two months later, the patient presented with dyspnea on minimal exertion and was discovered to have a hemolytic anemia. During the workup of his anemia, an aorta to left atrium fistula was detected on cardiac magnetic resonance imaging (Fig. 1).

Figure 1 Steady state free precession (SSFP) image in straight transverse view demonstrating the fistula between the noncoronary cusp of the aorta and the posteriorly located left atrium (arrow). LA, left atrium.
The patient was referred to our centre for an attempt at percutaneous closure of the fistula. A pre-procedural transesophageal echocardiogram confirmed the communication (Fig. 2), but also discovered dehiscence of the mitral annuloplasty ring with severe mitral regurgitation around both sides of the free portion of the ring (Fig. 3A and B, Movie 1). Aortography localized the fistulous channel between the noncoronary cusp of the aorta and the left atrium.

The development of the dehiscence was attributed to the presence of the fistula with resultant increase in LA pressure and dilation of the LA and mitral annulus. The most likely source of the hemolysis was the mitral inflow and regurgitation around the dehisced portion of the mitral ring. The patient was referred for surgical correction. During cardiopulmonary bypass, the dehisced mitral valve ring was replaced with a 29 mm St. Jude’s valve with successful closure of the aorta—left atrial fistula. There was no evidence of active infection in the blood stream or the excised tissue.

Discussion

Two surgical procedures confined to the treatment of mitral regurgitation are valve repair and valve replacement. Mitral valve repair, when feasible, has the advantages of preserving left ventricular geometry by maintaining subvalvular apparatus, eliminating the use of a prosthetic valve with its attendant complications, and avoidance of chronic anticoagulation.1

Dehiscence of an annular ring is a rare occurrence. A MEDLINE review of the literature published between 1966 and 2005 revealed only two previously described cases of mitral annular ring dehiscence with an aorta—left atrial fistula.
In an era with the increasing use of various imaging modalities including echocardiography, ventriculography and cardiac magnetic resonance (CMR) imaging, one must be aware of the limitations of each discipline. Although the left atrial to aorta fistula was well delineated by CMR and confirmed by ventriculography, the advantage of transesophageal echocardiography using two-dimensional, color, and spectral Doppler imaging allowed for the correct identification of both pathophysiological processes. With the increasing number of mitral valve repairs thus, the occurrence of a mitral ring dehiscence and its inherent diagnostic findings must be understood.

References