

Pseudoaneurysm of the Mitral-Aortic Intervalvular Fibrosa with Fistulous Flow into the Left Atrium Masquerading as Severe Mitral Regurgitation

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Abstract

Pseudoaneurysms of the mitral-aortic intervalvular fibrosa are a well-described complication of aortic valve prosthetic endocarditis. Pseudoaneurysms in this location may be complicated by formation of fistulous tracts with adjacent structures. Herein we describe a case in which fistulous flow into the left atrium produced an eccentric jet on color flow Doppler imaging which masqueraded as severe mitral regurgitation.

Case Report

Pseudoaneurysm of the Mitral-Aortic Intervalvular Fibrosa with Fistulous Flow into the Left Atrium Masquerading as Severe Mitral Regurgitation

Running title: Pseudoaneurysm

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Abstract

Pseudoaneurysms of the mitral-aortic intervalvular fibrosa are a well-described complication of aortic valve prosthetic endocarditis. Pseudoaneurysms in this location may be complicated by formation of fistulous tracts with adjacent structures. Herein we describe a case in which fistulous flow into the left atrium produced an eccentric jet on color flow Doppler imaging which masqueraded as severe mitral regurgitation.

Key words: prosthetic valve endocarditis; pseudoaneurysm; fistula; mitral regurgitation; mitral-aortic intervalvular fibrosa

Case Presentation:

A 49 year old male with a history of type A aortic dissection complicated by severe aortic regurgitation underwent insertion of a valved aortic conduit (Bentall procedure) 9 years prior to admission. Six years later he developed infective endocarditis necessitating replacement of the graft and valve. The patient did well for an additional 3 years until he was re-admitted to the hospital with fever. Blood cultures grew group B *Streptococcus* and he was referred for a transesophageal echocardiogram .

Echocardiographic Findings

Transesophageal echocardiographic examination revealed a normally functioning biologic prosthesis in the aortic position. A pseudoaneurysm could be seen within the adjacent mitral-aortic intervalvular fibrosa with its neck facing the left ventricular (LV) outflow tract. On color flow Doppler examination, a massive eccentric jet could be seen in the left atrium (LA) during systole

(Figure 1; Movie

clip 1). This was initially thought to represent mitral regurgitation (MR), however careful scanning revealed that the jet originated from a fistula connecting the pseudoaneurysm to the LA. Pulsed-wave pulmonary venous Doppler interrogation revealed systolic flow reversal indicating that the fistulous flow produced significant pressure and volume overload of the LA

(Figure 2).

Discussion

Abscesses represent extension of infection into the tissue surrounding an infected valve and occur in over half of patients with infected aortic valve

prosthetics (1). They most commonly develop in the mitral-aortic intervalvular fibrosa (MAIF), presumably because of the poor vascularity of the cardiac fibrous skeleton as well as the scar tissue left behind from prior surgery (2). Pseudoaneurysms are thought to evolve from abscesses which communicate with high pressure chambers, such as the left ventricle and aorta. It has been suggested that the high pressure generated in these chambers dissects into structurally deficient abscess cavities and remodels them into pseudoaneurysms (3).

Echocardiographically, pseudoaneurysms of the MAIF appear as pulsatile, narrow-necked echo-free outpouchings situated between the base of the anterior mitral valve leaflet and the inferior margin of the non-coronary sinus of the aortic root. On color-flow Doppler examination they demonstrate to-and-fro flow with the LV outflow tract.

Pseudoaneurysms of the MAIF protrude externally in between the LA and the aortic root with which they may form fistulous communications(2). Alternatively, they may perforate and drain freely into the pericardial space resulting in suppurative pericarditis(2). The present case is notable for fistulous communication with the LA which produced flow within the atrium that simulated severe MR. Careful scanning however confirmed that this flow did not arise from an incompetent mitral valve. Last, it is important to appreciate that fistulous flow into the LA has the same hemodynamic consequences as MR and may result in LA and LV volume overload.

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Figure Legends

Figure 1. A. Drawing of a perforated pseudoaneurysm arising from the mitral-aortic intervalvular fibrosa communicating with the left atrium.

B.

Transesophageal image revealing the neck of pseudoaneurysm and its fistulous communication with the left atrium. **C.** Color flow Doppler image showing a large eccentric jet (fistulous flow) which simulates mitral regurgitation. Ao- Aorta; LA – Left atrium; LV – Left ventricle; RV- Right ventricle.

Figure 2. Pulsed-wave Doppler recording obtained from the left upper pulmonary vein revealing systolic flow reversal (arrows).

Movie Clip Legend

Movie Clip 1. A large eccentric jet, representing fistulous flow, can be seen in the left atrium.

