Right Atrium Clot Formation following Percutaneous Transmitral Valvuloplasty

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ABSTRACT

This case report describes a rare complication of percutaneous transmitral commissurotomy (PTMC). A patient with severe mitral stenosis developed a clot in the right atrium after an unsuccessful PTMC procedure. Because of the high risk of thromboembolism, the patient underwent urgent surgery to remove the clot and to replace the mitral valve with a mechanical prosthesis.

INTRODUCTION

Percutaneous transmitral commissurotomy (PTMC) has been widely applied clinically, and potential complications have been defined. Studies of previous series found such complications as mitral regurgitation (MR), cardiac tamponade, thromboembolism, and septal perforation [Varma 2005; Onsea 2012]. To the best of our knowledge, however, clot formation in the right atrium after septal perforation has not previously been reported.

CASE PRESENTATION

A 48-year-old woman with a history of severe rheumatic mitral valve stenosis was referred for a PTMC procedure. The patient was in sinus rhythm. She was asymptomatic until 3 months previously, when she gradually experienced dyspnea on exertion. She had no other comorbidities and no other medical history. A transthoracic echocardiogram revealed a mildly enlarged left atrium with severe mitral stenosis (mean pressure gradient, 10 mm Hg; mitral valve area, 1 cm2) and mild pulmonary hypertension (mean pulmonary artery pressure, 30 mm Hg). PTMC was suggested to the patient, and a transesophageal echocardiography (TEE) evaluation was performed. The TEE inspection of the mitral valve leaflets and the subvalvular apparatus showed minor valvular calcifications and a Wilkins score of 6 without significant chordal

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fusion, calcification, or clot. There was only mild MR. Thus, the patient was scheduled for PTMC. A coronary angiography evaluation performed with fluoroscopy via a femoral approach showed patent arteries. A septal puncture was done with a Brockenbrough needle, and the mitral valve was dilated with an Inoue balloon (Figure 1). The PTMC produced moderate mitral stenosis and moderate MR with no other complications. A follow-up echocardiography examination performed the day after the PTMC revealed a large, highly mobile mass attached to the interatrial septum and protruding into the tricuspid valve. This finding suggested clot formation (Figures 2 and 3). The patient received anticoagulation therapy and was scheduled for surgery during the same admission. Owing to the moderate MR and stenosis, we replaced the mitral valve with a mechanical prosthesis. The right atrium clot was removed, and the atrial septum defect was repaired. At the 6-month follow-up, the patient was properly anticoagulated and reported no symptoms.



Figure 1. Injection into the left ventricle shows the mitral valve doming in favor of severe mitral stenosis and negligible regurgitation.



Figure 2. Transesophageal echocardiography after a percutaneous transmitral commissurotomy shows the left atrium (LA) and the right atrium (RA) with the clot attached by a stalk (arrow) to the interatrial septum at the puncture site.

DISCUSSION

In 1984, Inoue introduced PTMC as an effective alternative to closed mitral valvuloplasty. PTMC is safe and rarely leads to complications such as MR [Onsea 2012]. Other complications, such as tamponade, thromboembolism, and left-to-right shunt across the iatrogenic atrial septal defect, occur in less than 1% of cases. Acute, severe MR after disruption of the mitral valve apparatus and tamponade caused by cardiac chamber perforation are complications that necessitate urgent surgery [Varma 2005]. Clot formation in the right atrium has not previously been reported; however, a previously reported case of a left atrium clot was treated successfully with anticoagulation therapy [Roldán 2000]. The patient had no other comorbidities or a hypercoagulable state. The reason for the clot formation might have been formation of a stalk by a high septal puncture in a position other than the foramen ovale. These reports, along with previous reports [O'Shea 1992], confirm that surgical backup should be provided routinely for PTMC.



Figure 3. Another view of the clot attached to the interatrial septum at the puncture site. LA indicates left atrium; RA, right atrium.

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