Acute Mitral Regurgitation Due to Leaflet Tear After Balloon Valvotomy

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Percutaneous mitral balloon valvotomy (PMV) has evolved into an effective method for the treatment of patients with symptomatic mitral stenosis. An increase in mitral regurgitation can occur in ≈45% of patients undergoing PMV. Severe mitral regurgitation can be caused by rupture of chordae or of a papillary muscle. Noncommissural tearing of the mitral leaflet is also an important mechanism of severe regurgitation after PMV.

A 35-year-old woman presented with exertional dyspnea that had been present for 3 months. Physical examination revealed a chronically ill-looking appearance with malar flush and accentuated first heart sound, opening snap, and diastolic rumble at the apex. The ECG revealed normal sinus rhythm with left atrial enlargement. Transthoracic echocardiography revealed severe mitral stenosis with trivial mitral regurgitation. The echo score according to Wilkins et al was ≈8 (mobility, 2; thickening, 2; subvalvular, 2; and calcification, 2). Balloon mitral valvotomy was performed with a 28-mm Inoue balloon catheter. The effective balloon dilating area was ≈6.52 m². After 1 dilatation, the patient complained of chest tightness and dyspnea, with a markedly elevated v wave in the left atrial pressure tracing. Transesophageal echocardiography revealed severe eccentric mitral regurgitation toward the anterior wall of the left atrium, with suspicious tearing of the posterior mitral leaflet. These findings were confirmed at subsequent mitral valve replacement surgery with a prosthetic valve. The patient subsequently recovered and was uneventfully discharged days later.

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(Circulation. 1998;98:2095-2097.)

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Figure 1. Left atrial pressure tracing before and after balloon mitral valvotomy. A. Before valvotomy, there was a significant diastolic pressure gradient between left atrium (LA) and left ventricle (LV) suggestive of significant mitral stenosis. B. After severe mitral regurgitation, systolic LV pressure was decreased from 135 to 113 mm Hg, and mean LA pressure was increased from 20 to 48 mm Hg. The v wave reached ~80 mm Hg.
Figure 2. Top, Multiplane transesophageal long-axis view (137°) shows fluttering echogenic density at posterior mitral leaflet indicative of tearing of leaflet. Bottom, Color flow imaging corresponding to top panel shows eccentric severe mitral regurgitation toward anterior wall of left atrium.

Figure 3. Operative finding revealed tearing of mid scallop of posterior mitral leaflet (arrows).
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Circulation. 1998;98:2095-2097
doi: 10.1161/01.CIR.98.19.2095

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