

IMAGES IN INTERVENTION

Transfemoral Balloon Mitral Valvuloplasty for Severe Nonrheumatic Mitral Stenosis



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An 89-year-old woman was admitted to the hospital with dyspnea, renal failure, and atrial fibrillation with rapid ventricular response. Transthoracic (**Figure 1A**, **Online Video 1**) and transesophageal echocardiograms (**Figures 1B to 1D**, **Online Videos 2 and 3**) showed severe mitral

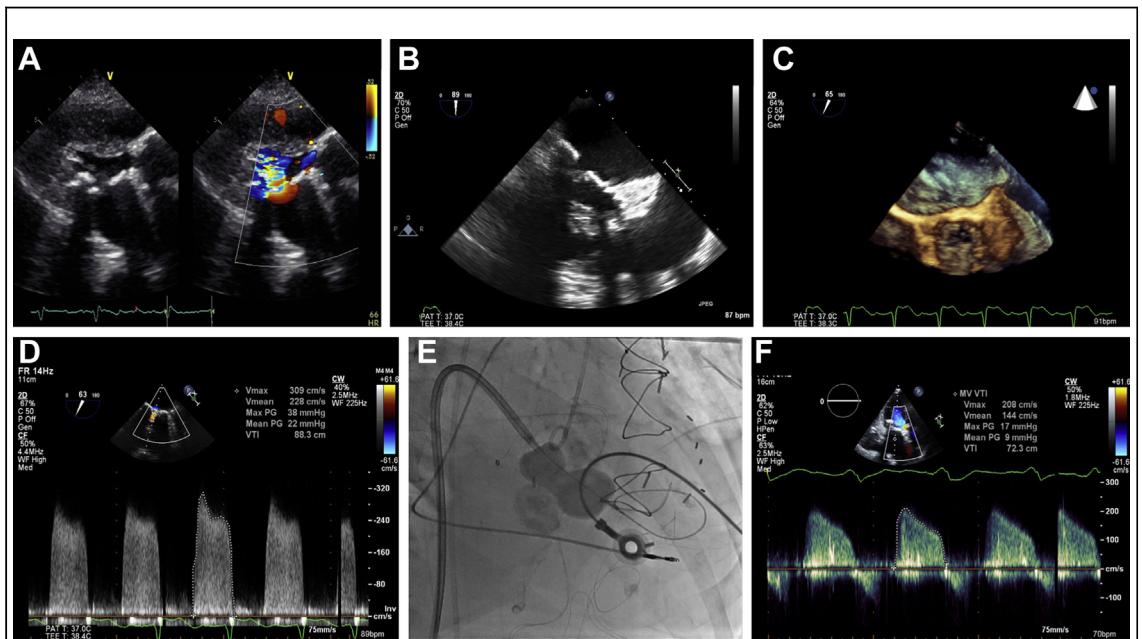


FIGURE 1 Pre- and Post-BMV Evaluation of Severe Non-Rheumatic Mitral Stenosis

(A) TTE (parasternal long-axis view) showing proximal flow convergence around the mitral valve (**Online Video 1**). (B) TEE (mid-esophageal view) demonstrating severe calcification of both mitral leaflets and the mitral annulus. Limited movement of the mitral leaflets is seen during diastole (**Online Video 2**). (C) TEE (mid-esophageal view, diastole) with 3-dimensional reconstruction demonstrating severely restricted leaflet mobility and reduced valve area (**Online Video 3**). (D) Continuous-wave Doppler from pre-procedural TEE demonstrates a mitral valve gradient of 22 mm Hg. (E) Inflation of a 26-ml Inoue balloon within the stenotic mitral valve (RAO 30) (**Online Videos 4 and 5**). (F) Continuous-wave Doppler from post-procedural TEE demonstrates a mitral valve gradient of 9 mm Hg. RAO = right anterior oblique; TEE = transesophageal echocardiogram; TTE = transthoracic echocardiogram.

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annular calcification (MAC), calcification of the leaflet bases, and shortening of the subvalvular apparatus—all consistent with severe nonrheumatic mitral stenosis (MS). Mean gradient was 18 to 22 mm Hg, with a valve area of 0.7 to 0.9 cm² by pressure half-time. Attempts were made to improve her low-output state, but intermittent hypotension limited beta-blocker up-titration, and atrioventricular nodal ablation with VVI pacing at 55 beats/min provided no clinical benefit. Her comorbid conditions precluded surgical valve intervention. After extensive discussion with family, the decision was made to pursue balloon mitral valvuloplasty (BMV) despite her unfavorable valve anatomy.

Transfemoral BMV was performed using a 26-ml Inoue balloon (Toray, Tokyo, Japan) (Figure 1E, Online Videos 4 and 5). Following balloon inflation, systolic blood pressures rapidly increased from the 90s to the 130s. Intraprocedural echocardiogram showed a decrease in the mean gradient from 22 to 9 mm Hg (Figure 1F), with no increase in mitral

regurgitation. Her symptoms significantly improved, and after several days of physical therapy, the patient walked out of the hospital under her own power. She died the following month in home hospice care.

This is the second reported case of BMV in nonrheumatic MS (1), and the first via the transfemoral approach. BMV is typically avoided because of prior research suggesting that calcification is linked to worse outcomes in rheumatic MS (2). Though such hesitation is understandable, this case suggests that BMV may be an option for palliative treatment in poor surgical candidates with severe nonrheumatic MS. Transcatheter mitral valve replacement may provide more durable results (3,4) and should be an area for future research.

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APPENDIX For the supplemental videos, please see the online version of this article.