

IMAGES IN INTERVENTION

A New Hope on Treatment of Atrial Dissection Complicated by Mitral Annulus Rupture

The First Case of Percutaneous Treatment

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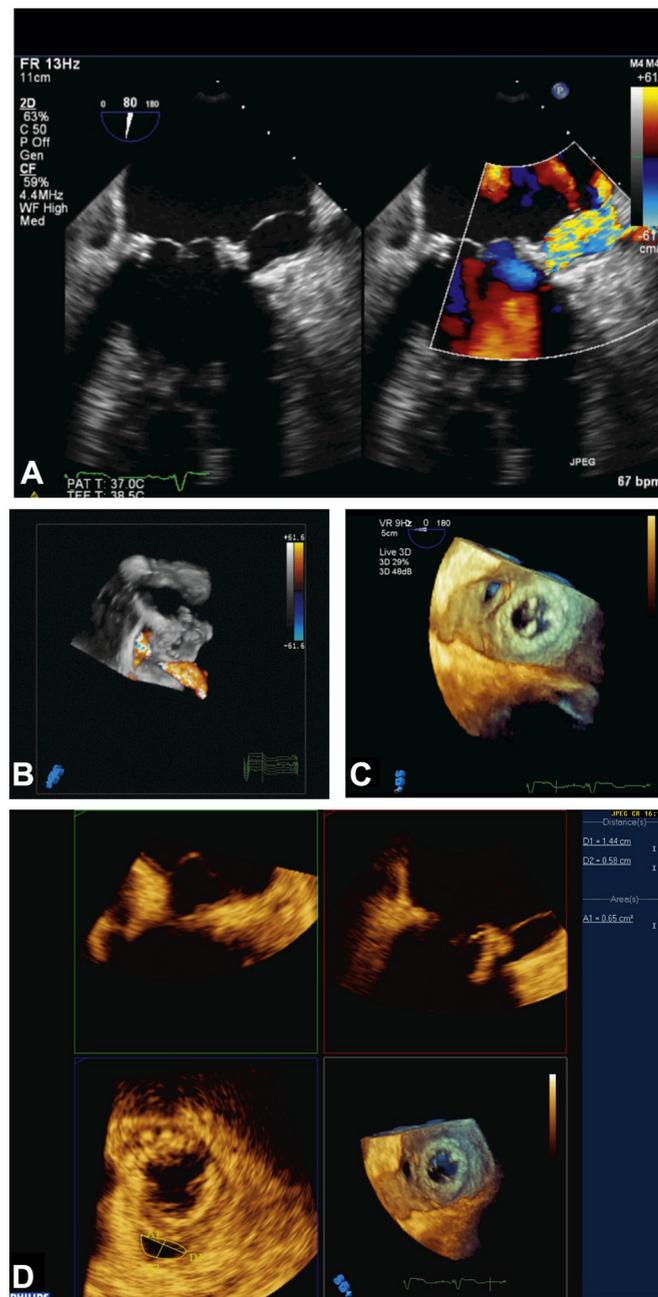
A 75-year-old woman with severe mitral regurgitation due to chordal rupture underwent mitral valve replacement with a 27-mm St. Jude Medical bioprosthesis. Intraoperative transesophageal echocardiography (TEE) showed a normal functioning prosthesis. Postoperative period was uneventful and the patient was discharged on postoperative day 11. Three months later heart failure ensued. TEE disclosed dissection of the left atrium (LA) wall complicated by rupture of the anterior aspect of the mitral annulus (**Figures 1A to 1C**, **Online Videos 1 and 2**).

Considering the patient's poor clinical condition, percutaneous intervention guided by TEE was undertaken. Atrial dissection was crossed retrograde and an arterial-venous loop was performed by

transeptal puncture. Low pressure inflation of a balloon until complete flow stop was used to assess the dimension of the defect and to choose the appropriate device (**Figures 1D and 1E**). A 6-mm Amplatzer ventricular septal device occluder (St. Jude Medical, Minneapolis, Minnesota) was implanted antegrade. The device pulled the endocardium and the epicardial layer close together occluding the false lumen. Effective occlusion of the rupture with almost complete disappearance of the atrial dissection was confirmed by TEE. A small posteromedial leak was left untouched.

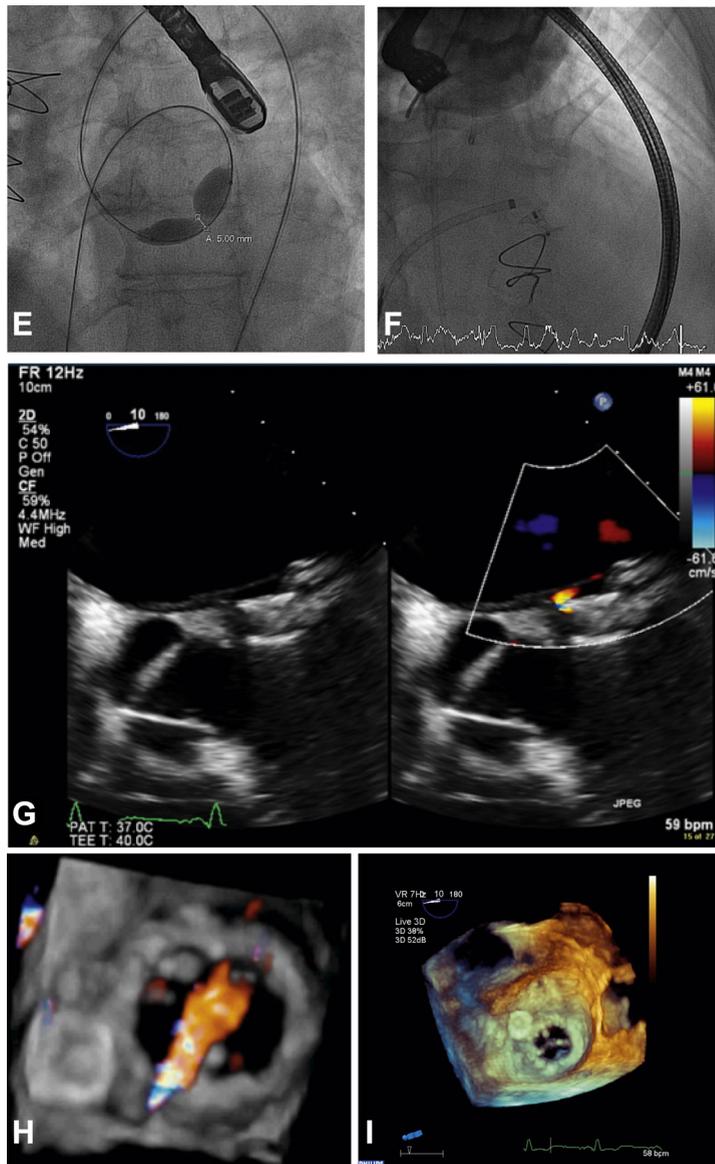
Three months later, the patient remains asymptomatic. A tiny leakage by the Amplatzer device with residual contained LA dissection remained (**Figures 1F to 1H**, **Online Videos 3 and 4**).

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FIGURE 1 TEE of the LA Wall

Transesophageal echocardiograph (TEE) showed a left atrium (LA) wall divided in 2 layers, permitting systolic flow from the left ventricle to the LA. Annulus rupture orifice measurements by TEE and fluoroscopy were similar. The atrial dissection was crossed retrograde and an Amplatzer ventricular septal defect (VSD) occluder was implanted anterograde. Post-intervention TEE showed a tiny leakage by the Amplatzer device and contained residual LA dissection. **(A)** Two-dimensional (2D) TEE showed annulus rupture permitting systolic flow from the left ventricle to the LA. **(B)** Three-dimensional (3D) color full volume showed annulus rupture orifice and systolic flow. **(C)** Three-dimensional Zoom TEE ([Online Videos 1 and 2](#)). We can see LA wall divided in 2 layers complicated by rupture of mitral annulus. **(D)** Annulus rupture orifice measurements by 3D TEE multiplanar reconstruction mode. **(E)** Fluoroscopy annulus rupture orifice measurements. **(F)** Fluoroscopy discloses the Amplatzer VSD occluder implanted anterograde. **(G)** Post-intervention 2D TEE showed a tiny leakage by the Amplatzer device and contained residual LA dissection. **(H)** Post-intervention 3D color full volume TEE showed the Amplatzer device and the small posteromedial leak left untouched ([Online Videos 3 and 4](#)). **(I)** Post-intervention 3D zoom TEE showed the Amplatzer device in place.

FIGURE 1 Continued



Beforehand, this rare and dreadful complication of mitral valve surgery could only be treated by open approach (1). Here we describe an alternative treatment for patients in whom the surgical risk is considered prohibitive.

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1. Fukuhara S, Dimitrova K, Geller C, et al. Left atrial dissection: an almost unknown entity. *ICVTS* 2015;20:6-100.

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