

IMAGES IN INTERVENTION

Severe Mitral Stenosis and Persistent Left Appendage Thrombosis

When an Old Percutaneous Solution Meets New Percutaneous Strategies



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A 58-year-old woman with rheumatic mitral valve disease was referred to our institution for percutaneous balloon mitral valvuloplasty (PBMV), as surgery was precluded because of severe obesity and neurocognitive dysfunction. Transesophageal echocardiography before planned PBMV confirmed severe mitral stenosis with a mean gradient of 11 mm Hg and mitral valve area of 0.8 cm². However, a large degree of contrast was present in the left atrium, with thrombus in the left atrial appendage (LAA) (Figure 1A). PBMV was postponed, and 6 months of intensive anticoagulation (target international normalized ratio 3.5) recommended; however, the patient was poorly compliant with anticoagulant therapy. We therefore decided to proceed with PBMV despite thrombus in the LAA by using an embolic protection device (EPD). For this purpose, using an 8-F sheath placed in the left common femoral artery, an angiogram of the aortic arch was obtained. The TriGUARD EPD (Keystone Heart, Delray Beach, Florida), which is a nitinol-frame mesh filter that covers all 3 aortic arch arteries, was deployed by pulling back the sheath and allowing the deflector to open in the aortic arch (Figure 1D). Transseptal puncture with a Brockenbrough needle and a Mullens sheath was then performed, followed by conventional PBMV

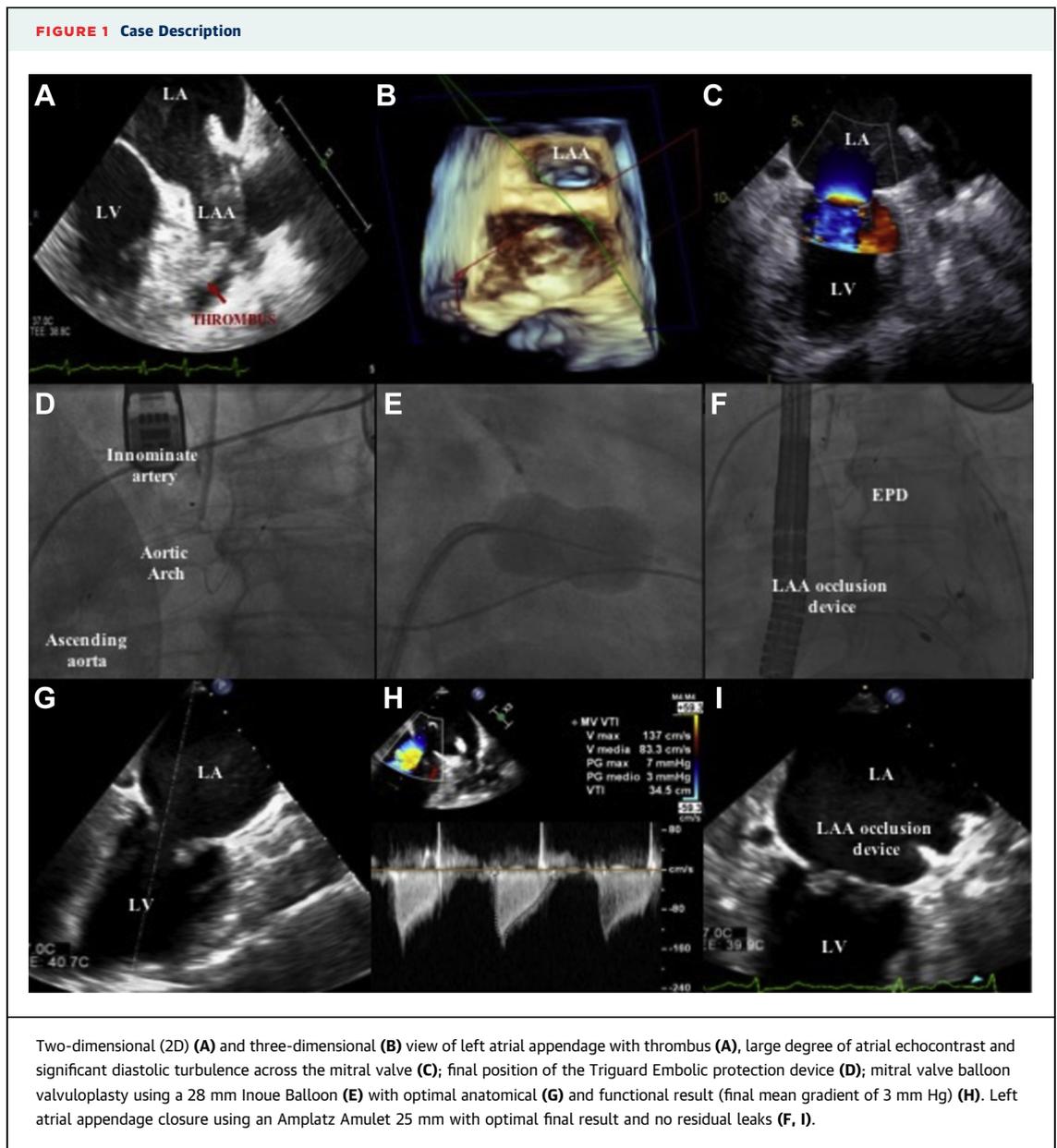
with a 28-mm Inoue-Balloon (Toray Industries, Tokyo, Japan) (Figure 1E), resulting in significant hemodynamic improvement (final transmitral gradient 4 mm Hg, mitral valve area 1.4 cm²). The Inoue-Balloon was retrieved and exchanged with the double-curved TorqVue sheath (St. Jude Medical, St. Paul, Minnesota). A 25-mm Amplatzer Amulet (St. Jude Medical) was then deployed, followed by TriGUARD EPD removal (Figures 1I and 1F). The patient's post-operative course was uneventful.

PBMV was introduced by Inoue in 1984 and is a recognized treatment option for severe pliable rheumatic mitral stenosis (1). One of the common contraindications to PBMV is LAA thrombus, which is present in about 0% to 3.1% of patients (2). A novel solution to overcome this is the placement of an EPD to protect the aortic arch vessels, thus avoiding potentially catastrophic embolic complications. In our case, we used the TriGUARD EPD, which ensures complete coverage of all 3 arch vessels.

Another possible solution is the placement of a Watchman (Boston Scientific, Natick, Massachusetts) device in the ascending aorta, the feasibility of which was recently described in 2 patients (3). Of note, the outcomes of patients with atrial fibrillation after PBMV are characterized by a high rate of

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stroke and peripheral embolization in the periprocedural period (6.4%) (4). To minimize the risk for embolism in our patient, with low compliance to anticoagulant therapy, we also performed percutaneous LAA closure.

This case shows the feasibility of a 1-step complex percutaneous intervention that combines old and new transcatheter options to minimize the risk of complications. However, the use of a cerebral

protection device is an off-label indication in PBMV, and its use should be reserved only for patients with contraindications to surgery and with thrombus in the distal half of the LAA.

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REFERENCES

1. Inoue K, Owaki T, Nakamura T, Kitamura F, Miyamoto N. Clinical application of transvenous mitral commissurotomy by a new balloon catheter. *J Thorac Cardiovasc Surg* 1984;87:394-402.
2. Palacios IF. Percutaneous mitral balloon valvotomy for patients with mitral stenosis. *Curr Opin Cardiol* 1994;9:164-75.
3. Yadav PK, Wang DD, Eng MH, O'Neill WW. Watchman in ascending aorta for systemic protection (WAASP): novel use of Watchman in ascending aorta for embolic protection—first in man. *Catheter Cardiovasc Interv* 2017 May 4 [E-pub ahead of print].
4. Nair KK, Pillai HS, Thajudeen A, et al. Immediate and long-term results following balloon mitral valvotomy in patients with atrial fibrillation. *Clin Cardiol* 2012;35:E35-9.

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