

Images in Cardiovascular Disease



OPEN ACCESS

Received: Sep 2, 2020

Revised: Sep 21, 2020

Accepted: Sep 23, 2020

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Conflict of Interest

The authors have no financial conflicts of
interest.

Author Contributions

Data curation: Singhi AK; Investigation: Singhi
AK; Methodology: Sivakumar K; Resources:
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Writing - review & editing: Singhi AK.

Embolization of Two Occluder Devices Following Device Closure of Acute Postoperative Mitral Paravalvular Leak

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A 36-year-old male underwent mitral valve replacement with a single leaflet mechanical prosthesis for rheumatic chronic severe mitral regurgitation associated with cardiac cachexia, chronic atrial fibrillation, and severe pulmonary hypertension. His postoperative period was complicated by uncontrolled heart failure, recurrent refractory pericardial and pleural effusions, warranting creation of surgical pleuro pericardial window through a left anterolateral thoracotomy. A mild mitral paravalvular leak adjacent to the left atrial

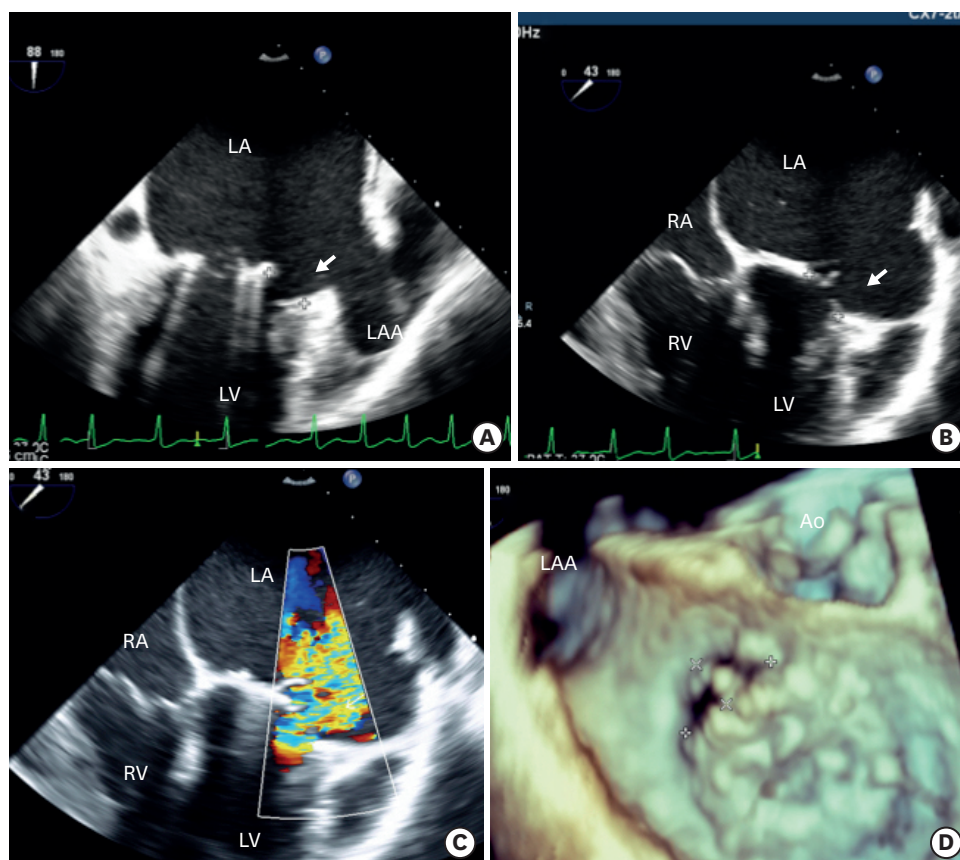


Figure 1. Two chamber (A) and 4 chamber (B) views on transesophageal echocardiogram with colour flow mapping (C) show large anterolateral mitral paravalvular leak (arrow) adjacent to LAA (Movie 1). Enface left atrial view on 3-dimensional echocardiogram (D) shows the orientation of the leak in surgical view.
LA: left atrium, LAA: left atrial appendage, LV: left ventricle, RA: right atrium, RV: right ventricle.

appendage on third post-operative day progressively enlarged to 16 mm at 2 months (**Figure 1, Movie 1**) leading to referral to our centre. Cardiac catheterization after 2 months showed



Figure 2. Left atrial pressure tracing after transseptal puncture shows markedly elevated pressures with tall v-waves.

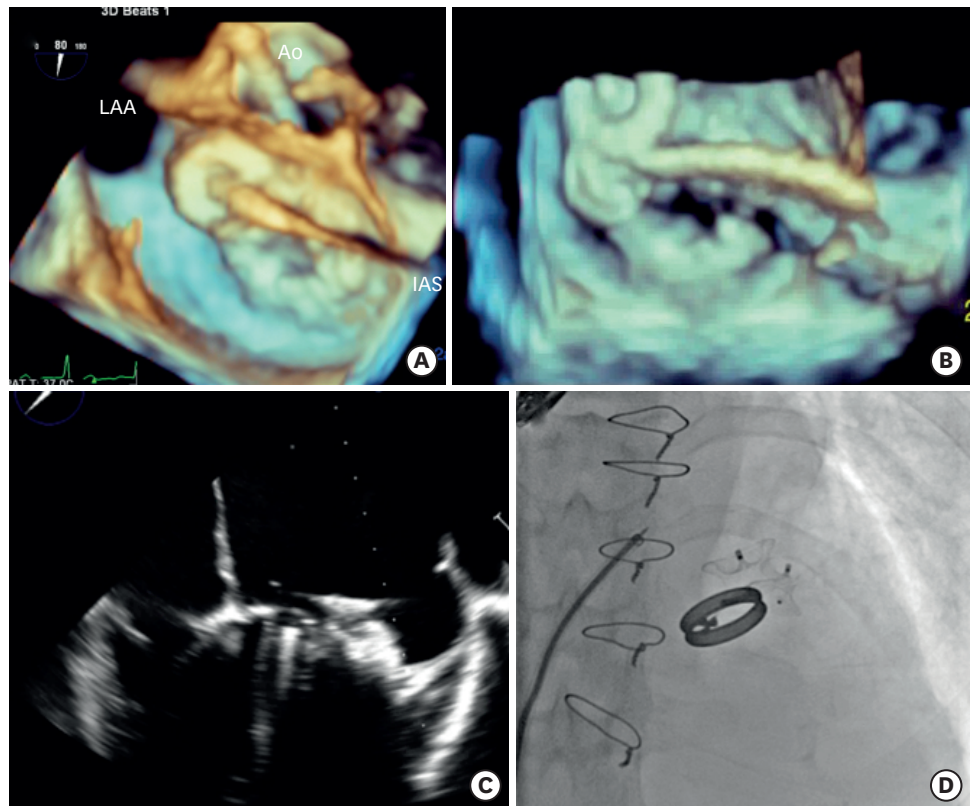


Figure 3. Left atrial enface view on 3-dimensional transesophageal echocardiogram during deployment of the first device (A) and second device (B) shows appropriate and stable position of the device that was confirmed after release of the cable in 4 chamber view (C). The stability of the 2 interlocked devices was confirmed on fluoroscopy (D) in right anterior oblique view (**Movie 2**). Ao: aorta, IAS: inter atrial septum, LAA: left atrial appendage.

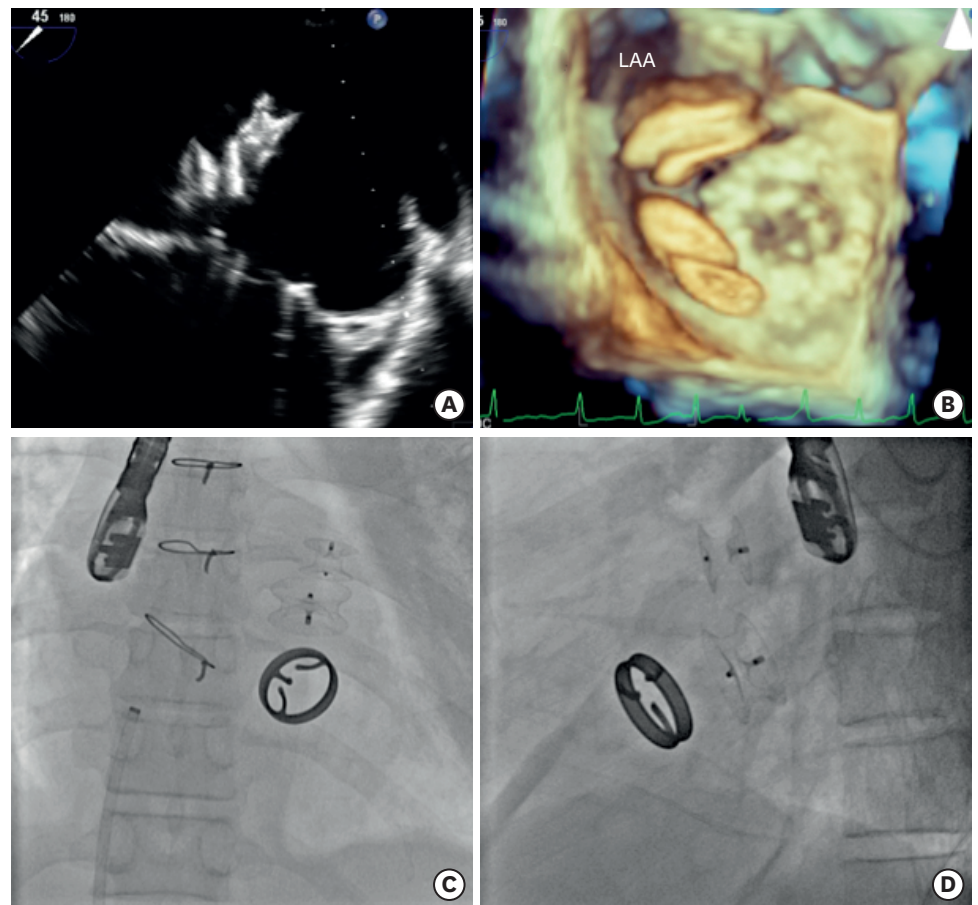


Figure 4. Embolization of the 2 devices was noted few minutes later on transesophageal echocardiogram (A) and 3-dimensional view (B) as well as fluoroscopy (C, D) where they appeared as floating butterflies (**Movie 3**) due to the impact of the regurgitant jet on the devices in left atrium. LAA: left atrial appendage.

near systemic pulmonary artery pressures. The left atrial v-waves and mean pressures after transseptal puncture were 86 and 46 millimetres of mercury (**Figure 2**). Closure of the leak through transseptal sheaths (**Figure 3, Movie 2**) with 2 large 16 mm and 10 mm Amplatzer muscular ventricular septal defect occluders (Abbott, Plymouth, MN, USA) reduced the left atrial pressures to 35 millimetres of mercury. However, both devices embolized within a few minutes and started floating like butterflies in the left atrium due to the impact of the paravalvular regurgitation jet (**Figure 4, Movie 3**). Immediate surgical retrieval on cardiopulmonary bypass through a redo sternotomy and suture of the leak led to early recovery. Risk factors for embolization of paravalvular leak devices include very large regurgitant orifices, more than one interlocking device and inadequate annular fibrosis in an acute postoperative setting.^{1,2} On a follow-up of 6 years, he was asymptomatic with normal prosthesis function and permanent atrial fibrillation.

SUPPLEMENTARY MATERIALS

Movie 1

Two chamber (A) and 4 chamber (B) views on transesophageal echocardiogram with colour flow mapping (C) show large anterolateral mitral paravalvular leak adjacent to Left atrial appendage. Enface left atrial view on 3-dimensional echocardiogram (D) shows the orientation of the leak in surgical view.

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Movie 2

Left atrial enface view on 3-dimensional transesophageal echocardiogram during deployment of the first device (A) and second device (B) shows appropriate and stable position of the device that was confirmed after release of the cable in 4 chamber view (C). The stability of the 2 interlocked devices was confirmed on fluoroscopy (D) in right anterior oblique view.

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Movie 3

Embolization of the 2 devices was noted few minutes later on transesophageal echocardiogram (A) and 3-dimensional view (B) as well as fluoroscopy (C, D) where they appeared as floating butterflies due to the impact of the regurgitant jet on the devices in left atrium.

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