PERI-PROCEDURAL ULTRASEAL LAA DEVICE DISLODGMENT FOLLOWED BY SURGICAL RETRIEVAL

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Background:

A 70-year-old man with a history of mitral annuloplasty ring, hypertension, and atrial fibrillation, with a CHADS-VA2SC score of 2, was started on rivaroxaban. He had recurrent admissions for lower gastrointestinal bleeding requiring repeated blood transfusions due to small bowel angiodysplasia. Hence, the patient was offered the option of percutaneous left atrial appendage occlusion (LAAO) since he could not tolerate long-term anticoagulation.

Imaging:

As part of the work-up for LAAO, the patient underwent a transoesophageal echocardiogram (TEE) and cardiac computed tomography (CT).

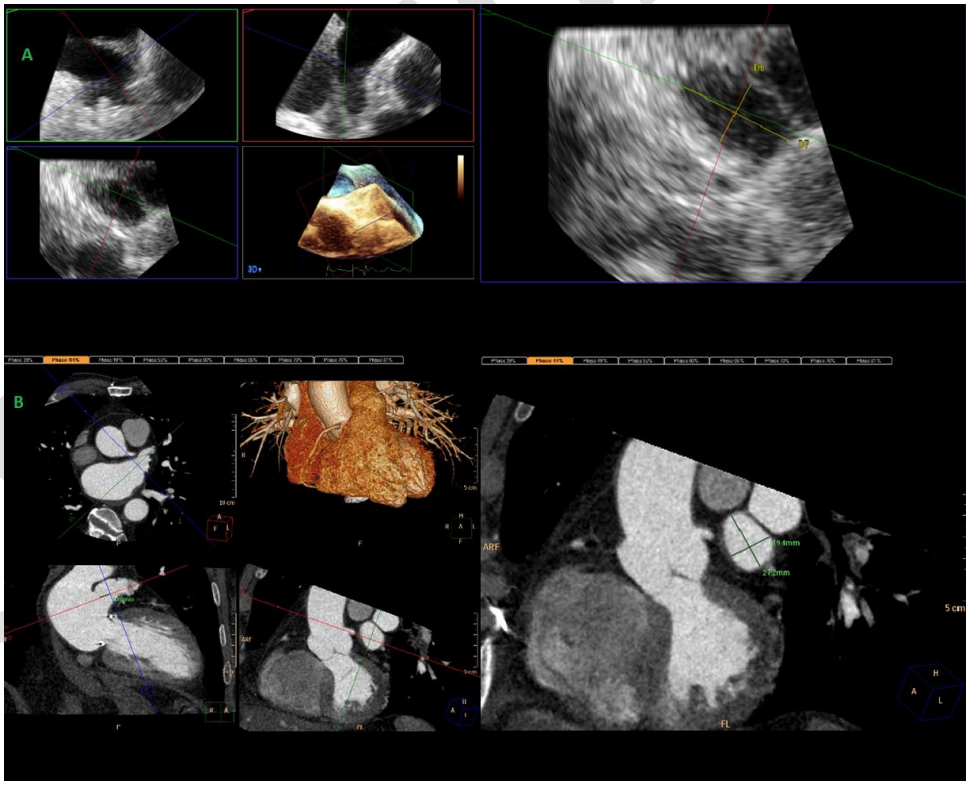

Figure 1: (A) 3D TEE landing zone dimensions (1cm below os defined by left circumflex and tip of coumadin ridge): maximum diameter 23mm; minimum diameter 12mm (B) Cardiac CT shows chicken wing appendage with one lobe and a single acute bend. Landing zone dimensions: maximum diameter 28mm; minimum diameter 19.5mm. The patient was in atrial fibrillation during both pre-procedural scans.

Indication for intervention:

A percutaneous LAAO was attempted under TEE guidance. The patient was in sinus rhythm during the entire procedure. A depth of the LAA of 23 mm and a landing zone width of 20 mm were measured on TEE. A 26mm Ultraseal device was selected. Although the device protruded slightly outside of the LAA, a tug test and compression test were reassuring, and the device was released. While monitoring the device position with TEE, the Ultraseal device suddenly popped out of the LAA, and embolized into the left atrium. Prolonged attempts were made to recapture the device using snare and deployment bioptome which proved to be unsuccessful. Ultimately, the patient underwent surgical retrieval of the device.

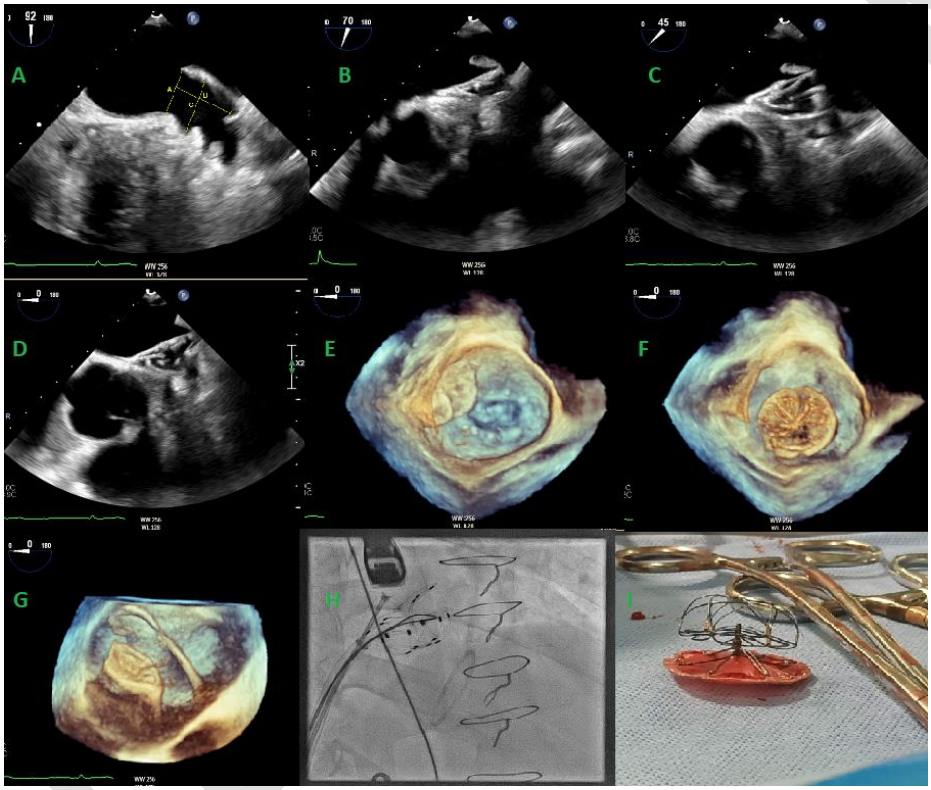

Figure 2: (A) TEE showing sizing of os 16mm, landing zone 20mm and depth 22mm; (B), (C), (D) TEE shows outside protrusion of device into the LA and chronologic views of acute embolization, including 3D views in (E) and (F); (G) 3D views showing attempt to capture the device with a snaring technique; (H) Fluoroscopic view showing snaring of device but unsuccessful capture with deployment bioptome; (I) full surgical retrieval of device.

Learning points of the procedure:

Percutaneous LAAO is a feasible option in patients with high stroke risk who cannot tolerate anti-coagulation long-term. Embolization of a percutaneous LAAO device is a rare complication, occurring mostly during the peri-procedural period. Whereas percutaneous retrieval using a snaring technique is the most feasible option when embolization to the left atrium occurs, this may prove to be difficult, hence requiring surgical intervention.

Confirming adequate device Position, Anchor, Seal and Size compression (PASS test) before release is essential, in order to prevent this complication. In this case, the limited depth of the LAA prevented a stable landing zone for the device inside the LAA after deployment.

Moreover, there might have been an issue with device sizing since there was a small discrepancy between pre-procedural measurements taken in AF and peri-procedural TEE measurements taken in normal sinus rhythm.