

RARE CAUSE OF DIFFICULT DEVICE RETRIEVAL OF AN EMBOLIZED ATRIAL SEPTAL OCCLUDER USING THE DOUBLE SNARE TECHNIQUE

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HISTORY AND PHYSICAL EXAMINATION

A 29-year old male patient was presented with abnormal electrocardiogram (EKG) and incidentally detected large atrial septal defect (ASD). EKG showed right axis deviation of the QRS complex and intra-ventricular conduction delay. Transthoracic echocardiography demonstrated large sized ASD (32 mm), markedly enlarged right atrium (RA) and ventricle with moderate pulmonary hypertension.

IMAGING

Trans-esophageal echocardiography (TEE) indicated a single oval shaped secundum defect with 32x25 mm with deficient aortic and inferior limb. We successfully deployed 36-mm Occlutech Figulla Flex II ASD device, but device was found at pulmonary position on chest X-ray on the next day

Fig 1: (A) Successful implantation of 36-mm Occlutech Figulla Flex II ASD device and (B) embolization to main pulmonary artery (MPA).

Fig 2: (A) Retrieval of embolized device was tried with double snare technique using two gooseneck snare catheters in a single sheath to secure holding RA pin of device in MPA. Despite of several attempts, it could not be retrieved because of trapping at the tip of 14-Fr delivery sheath. (B) Stucked device with sheath was cautiously moved to inferior vena cava (IVC) using double snares to hold the pin. The device was successfully retrieved with jaws of the Occlutech Flex II delivery cable within the sheath at IVC.

INDICATION FOR INTERVENTION

1. Large secundum ASD associated with volume overload of right heart and moderately increased pulmonary arterial pressure. 2. Embolized ASD occluder

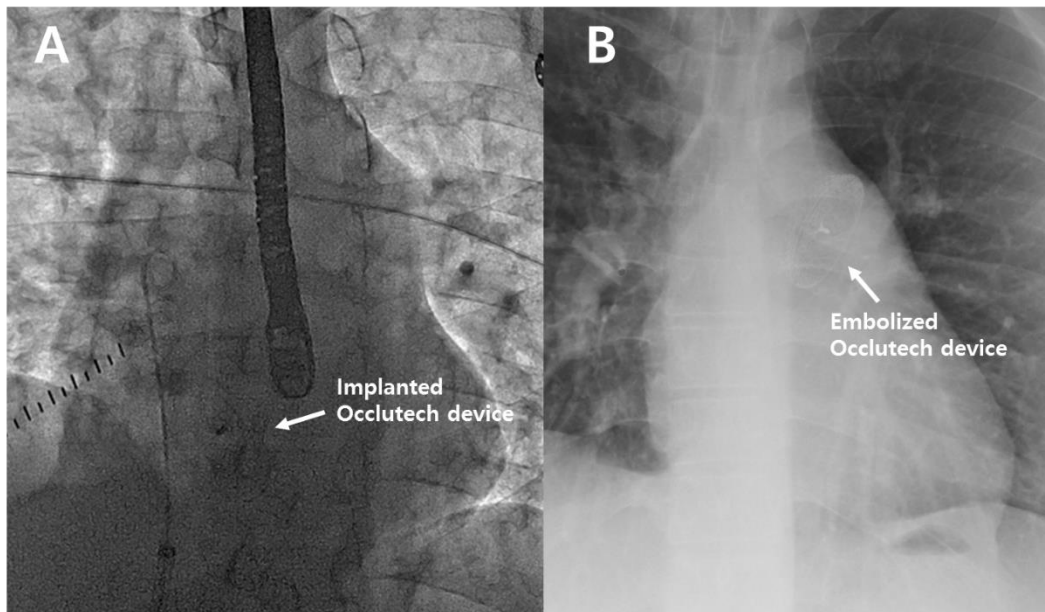


Fig 1. Implantation of Occlutech ASD device (A) and embolization (B)

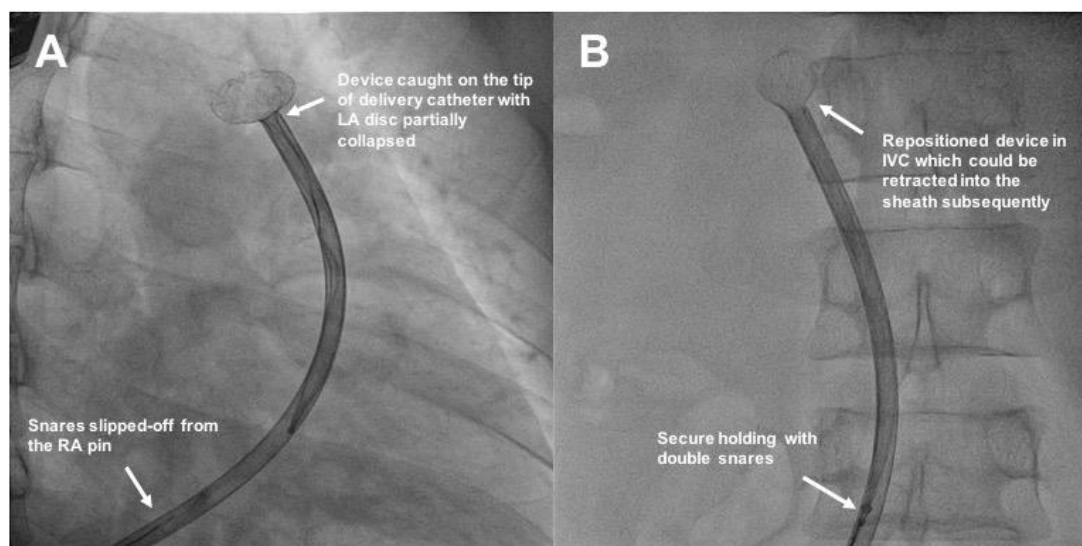


Fig 2. Retrieval of Occlutech ASD device

INTERVENTION

The defect was closed using a 36-mm Occlutech® Figulla® Flex II ASD device and the device was released after stability test with Minnesota wiggle (Fig 1-A). On the next day, embolization of the device to MPA was found on chest X-ray (Fig 1-B). We decided to retrieve the device percutaneously. First gooseneck snare (10 mm) was introduced using 4 Fr catheter within 6 Fr Judkin right guiding catheter (telescopic technique) through a 14 Fr delivery sheath positioned in MPA. After holding RA pin with the snare, another snare catheter (15 mm multi-snare) was introduced through delivery sheath by the way like threading the needle and snared the pin again to secure grip (double snare technique). The device was partially retrieved into delivery sheath, however the rest of it could not be retrieved anymore despite several attempts with double-snaring (Fig 2-A). We expected that it could not be enough to secure holding even with double snares because of slippery RA pin and/or damaged tip of delivery sheath which blocked the device to be withdrawn. We cautiously pulled the partially

uncollapsed device, snares and the sheath as a unit to the IVC with holding the pin with double snares. The rest body of device was successfully withdrawn into delivery sheath using double snares (Fig 2-B), and it was escaped out using with jaws of the Occlutech Flex II delivery cable. Finally, we implanted 40 mm Amplatz septal occluder with right upper pulmonary vein technique.

LEARNING POINTS OF THE PROCEDURE

Double snare technique may provide additional grip to securely hold small RA pin and facilitate the retrieval of an embolized Occlutech device. However, device retrieval may be complicated even with the double snare technique in rare cases of device locking at the orifice of the retrieval sheath with narrowed internal lumen caused by internal folding of the sheath tip. We speculate that the acute angulation between device and the retrieval sheath may attribute to this, so we recommend to consider the alignment between the device and sheath to prevent any deformation of the sheath tip which may potentially cause difficulties in retrieval of the device. Partially collapsed device may more easily be retrieved into the sheath with an elongated configuration in IVC.