Cough
A Potentially Life-Threatening Condition After Interventional Closure of Atrial Septal Defect

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A 3.5-year-old girl (weight, 19 kg; height, 103 cm) was hospitalized for interventional closure of secundum atrial septal defect (ASD II). In transthoracic and transesophageal echocardiography (TEE), we found a hemodynamically relevant left-to-right shunt caused by isolated ASD II without any systemic or pulmonary venous anomaly. All heart valves were patent and showed no regurgitation. The size of the ASD II was 9.5 × 7 mm, with enough rims to the aorta, the superior wall of the atrium, and the systemic and pulmonary veins (Figure 1A). No balloon sizing was performed.

With the patient under general anesthesia, a 10-mm Amplatzer Septal Occluder (ASO; AGA Medical, Golden Valley, Minn) was implanted with no complications. The postinterventional TEE, in all standard positions, showed no relevant shunt and accurate positioning of the ASO (Figure 1B and online-only Data Supplement), which also was documented by fluoroscopy (Figure 1C and 1D).

In the recovery room and later in the ward, the patient began to cough repeatedly, so she was given isotonic saline solution and corticosteroid to inhale. She was hemodynamically stable the entire time.

A routine transthoracic echocardiography performed the next day showed absence of the ASO in situ (atrial septum), with the ASO imaged in the region behind the left atrium (Figure 2A). Fluoroscopy confirmed the dislocation of the ASO to the left upper sternal border and hinted at migration into the pulmonary artery (Figure 2B and 2C). The patient underwent emergency surgery. The ASO could not be found after inspection of the right and left atria and was not visible after incision of the pulmonary artery. Intraoperative fluoroscopy revealed device position in the distal aortic arch. The aortic arch was incised longitudinally and the ASO was removed. The ASD was closed with a Dacron patch per standard procedure.

Figure 1. TEE shows ASD with left-to-right shunt (A). TEE of Amplatzer septal occluder shows its accurate position without any shunt (B). Fluoroscopy (C: frontal; D: lateral) shows that the device is correctly positioned after deployment.
The postoperative course was uneventful. Follow-up echocardiography showed no residual shunt or valve regurgitation. The patient was discharged in good health on the seventh postoperative day.

Device closure of ASDs has emerged as an attractive alternative to surgical closure for reduced morbidity, lack of a scar, low complication rate, and shorter hospital stay.1–3

Our patient faced a remarkable postinterventional clinical course. Postinterventional TEE demonstrated perfect device position after release, so we did not expect any clinical problems. We speculate that episodes of intensive coughing in the recovery room caused intra-abdominal pressure overload (Valsalva maneuver) with consequent pressure overload in the right atrium and dislocation of the ASO. According to the literature, most embolized devices migrated into the pulmonary artery,1,2 and only a few cases of systemic arterial embolization of an ASD occluder have been reported.4

Systemic arterial embolization of the ASO may occur in children with a postprocedurally perfect device position in the interatrial septum. Clinicians should be alerted to this complication, even in asymptomatic children, to securely localize the position of an embolized occluder before surgery is initiated.

**Disclosures**

None.

**References**

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