



PREDICTION OF INTERFERENCE AMONG THE MULTIPLE DEVICES AND HEART STRUCTURE: INSIGHTS FROM A MULTI-FENESTRATED ATRIAL SEPTAL DEFECT CASE

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History and physical:

Around 10% of patients with secundum-type atrial septal defect (ASD) are reported to have multi-fenestrated ASD. Some multi-fenestrated ASD case needs more than two devices at the transcatheter ASD closure.

A 50-year-old woman was referred to our outpatient clinic searching for the cause of her cerebral infarction. During the workup, we found multiple atrial septal defects and Lambli's excrescences.

Imaging:

Trans Thoracic Echocardiography: positive microbubble test (grade 4), Qp/Qs 1.6

Trans Esophageal Echocardiography (TEE): Multi-fenestrated ASD: At least three. Maximum 6mm in diameter near the Valsalva sinus, and a small 2 to 4mm defect at the posterior side of the main defect. We also found 4mm Lambli's excrescences at the left coronary cusp.

Computed Tomography: no apparent vascular anomalies

Magnetic Resonance Imaging: fresh cerebral infarction at right anterior cerebral artery

Indication for intervention:

History of embolic stroke of undetermined sources (ESUS);

ASD with large shunt sought to be the cause of ESUS;

Suspected right heart burden;

Lambli's excrescence was a concern of cause for stroke. However, after the brain-heart team conference, we decided to close the functionally significant atrial septal shunt.



Intervention:

We performed transcatheter ASD closure under general anesthesia. From the right femoral vein, a 7Fr sheath was inserted, and a 0.035 guidewire was crossed to small posterior ASD under TEE guidance. We selected an 18mm Amplatzer™ Cribriform Occluder, and the Occluder was deployed as expected, and we moved on to the main defect closure. We crossed the main ASD near the Valsalva sinus by the guidewire, chose a 25mm Amplatzer™ Cribriform Occluder, and delivered. The Occluder was intended to pinch the first Occluder and expected to make A-shape to the sinus of Valsalva. However, the first Occluder was moved downward, and the second Occluder was placed higher than expected without hugging the Valsalva sinus. There was no residual trans-atrial shunt. There was no apparent interference between the Occluder and main heart structures; we finished the procedures. Although there were no complications, however, the second Occluder was placed at the unintended position. We analyzed the three-dimensional TEE imaging after the procedure and found that the residual ASD after the first Occluder deployment was shaped like the crescent moon, with the body located above the Valsalva sinus, not in the middle of the first Occluder and the Valsalva sinus.

Learning points of the procedure:

We experienced a multi-fenestrated ASD case that underwent ASD closure using two ASD Occluder devices. Three-dimensional TEE imaging would help us to predict the interference among the ASD Occluder and heart structure more precisely.



