A 4-year-old asymptomatic girl presented for elective transcatheter closure of her ostium secundum atrial septal defect (ASD). Her examination revealed a fixed split second heart sound with a 2/6 systolic ejection murmur at the left upper sternal border and a right ventricular lift. Transthoracic echocardiogram demonstrated a 15-mm secundum ASD with a mildly dilated right ventricle. The left coronary artery (LCA) could not be readily identified on the study. The patient was referred for percutaneous device closure when a preprocedural transesophageal echocardiogram revealed a moderate-sized secundum ASD with left to right shunting, moderate right ventricle dilation, and an anomalous origin of the LCA from the right sinus of Valsalva was identified (Figure 1A). The origin and distribution of the right coronary artery was normal. Cardiac catheterization revealed a Qp:Qs ratio of 2:1. Aortography confirmed the anomalous origin of the LCA from the right sinus of Valsalva with a course posterior to the aorta (Figure 2A).

With balloon sizing using the stop flow technique, the ASD measured 12 mm in diameter. A 12-mm Amplatzer septal occluder was then positioned but not released in the defect and was evaluated by transesophageal echocardiogram. The Amplatzer septal occluder was well seated but concern arose secondary to the device’s proximity to the anomalous LCA as it coursed posterior and adjacent to the atrial septum (Figure 1B). A repeat aortography revealed systolic compression of the LCA (Figure 2B and online-only Data Supplement Video). No electrocardiogram abnormalities suggesting ischemia or hemodynamic changes occurred. The device was successfully removed and a repeat aortogram demonstrated no further distortion of the LCA (Figure 2C). The patient recovered well and has been recommended for surgical ASD closure.

In the current era, there exist very few contraindications to transcatheter closure of secundum ASDs and very few peri- and postprocedural complications. Known device-related complications of percutaneous ASD closure, particularly with the Amplatzer septal occluder, include worsening of aortic regurgitation and cardiac erosion. Additionally, little information is available regarding the presence of coronary artery anomalies in patients undergoing ASD device closure. To our knowledge, this is the first reported case providing...
angiographic evidence of a coronary anomaly inhibiting safe deployment of an ASD device in a pediatric patient. There has been 1 reported case of a pediatric patient with a circumflex from the right coronary artery with retroaortic course leading the authors not to attempt device closure due to concerns for coronary compression. There are 2 case reports in the adult literature of patients with a similar coronary anomaly to our patient in which ASD device closure was attempted. Although our team decided not to deploy the device, it is possible that the reorientation of the Amplatz septal occluder device that typically occurs may have relieved the coronary arterial compression and allowed safe and successful ASD closure. Also, attempts with other, less rigid septal occlusion devices may have provided alternatives for ASD closure without coronary compression.

Before percutaneous device closure, a complete echocardiographic study with careful assessment of coronary arteries should be performed. If concerns for a coronary anomaly are present, then additional imaging or coronary angiography should be performed before attempts at ASD device closure.

Figure 2. A, Aortogram of left coronary artery (LCA) off the right sinus of Valsalva with retroaortic course. B, Systolic compression of the LCA by the Amplatz septal occluder (ASO). C, Follow-up aortogram with normal LCA flow with atrial septal defect (ASD) device removed.

Disclosures
None.

References

Keywords: atrial septal defect ▪ catheterization ▪ coronary anomaly ▪ percutaneous closure ▪ TEE
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