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IMAGES IN INTERVENTION

Far From the Septum

Transcatheter Cardioform Septal Occluder Device Closure of a Descending Aortic Pseudoaneurysm Late After Interrupted Aortic Arch Repair

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An asymptomatic 34-year-old woman with DiGeorge syndrome and interrupted aortic arch type B presented for care. She had undergone neonatal palliation with a 6-mm interposition graft followed by 16-mm extra-anatomic ascending to descending aortic jump graft placement in childhood. Screening cardiac magnetic resonance imaging was notable for a large pseudoaneurysm arising from the lateral wall of the descending aorta, immediately adjacent to the distal anastomosis with the jump graft (**Figure 1**, Online Video 1). Aortic pseudoaneurysm is a well-described complication of repaired aortic coarctation. Surgical repair is more common than endovascular techniques in this population (1). In this case, following multidisciplinary conference discussion, the patient was referred for percutaneous intervention.

Given the proximity of the pseudoaneurysm to both the jump graft and native descending aorta, covered stent graft therapy was felt to be contraindicated. Using real-time x-ray and 3-dimensional magnetic resonance imaging fusion for guidance (VesselNavigator, Philips Medical, Amsterdam, the Netherlands), the pseudoaneurysm was accessed rapidly and a 30-mm Cardioform septal occluder (W.L. Gore, Flagstaff, Arizona) was deployed across the 17-mm neck of the pseudoaneurysm, thereby occluding flow (**Figure 2**). Mild stenosis at the distal aspect of the jump graft, accentuated by the "aortic" disc of the Cardioform device, resolved completely with placement of a balloon-expandable stent across the distal jump graft (**Figures 3 and 4**, Online Video 2). At 1-month follow-up, computed tomography angiography demonstrated complete occlusion of the pseudoaneurysm (**Figure 5**, Online Video 3).

Although the Cardioform septal occluder is indicated for closure of secundum atrial septal defects, the device has been utilized outside of this space, including for post-myocardial infarction ventricular septal defects (2). Innovative use of existing technology is especially important in adult congenital heart disease patients, where anatomic defects are frequently complex and unusual and purpose-built technologies are lacking (3). This report highlights the successful use of a Cardioform device to close a complex descending aortic pseudoaneurysm, late after interrupted aortic arch repair.

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From the Heart Institute, Cincinnati Children's Hospital Medical Center, Cincinnati, Ohio. Dr. Goldstein has served as a consultant for W.L. Gore & Associates and Philips Medical. All other authors have reported that they have no relationships relevant to the contents of this paper to disclose.

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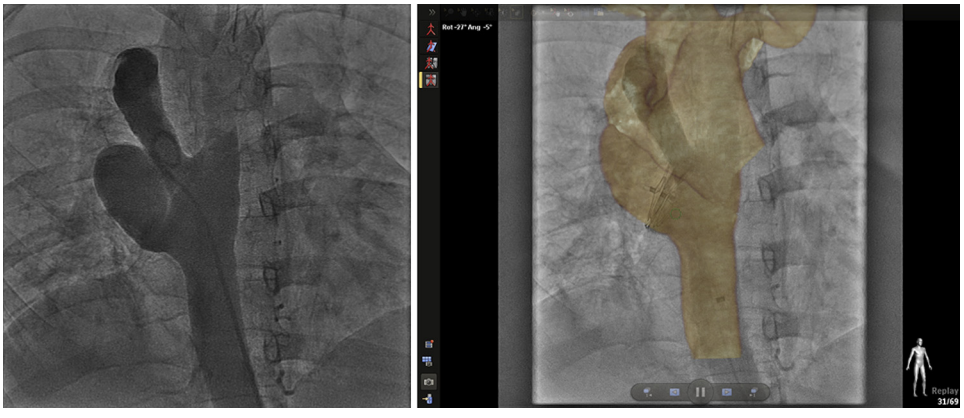
FIGURE 1 Pre-Procedural CT Angiography and Reconstruction

(Left) Screening computed tomography (CT) angiography demonstrated the presence of a large pseudoaneurysm, originating off the descending aorta (DAo), immediately adjacent to the DAo anastomosis with the extra-anatomic jump graft. Notably, the jump graft is calcified and stenotic near its insertion with the DAo. **(Right)** A 3-dimensional reconstruction highlights the large pseudoaneurysm and its relation to the jump graft and DAo (Online Video 1).

FIGURE 2 Intraprocedural Angiography and VesselNavigator Fusion Guidance



(Left) Baseline 2-dimensional angiographic assessment of the jump graft and adjacent large pseudoaneurysm. There appears to be a mild stenosis of the jump graft at its insertion with the DAo. **(Right)** Using fusion of the existing 3-dimensional reconstruction (from the screening CT angiogram) and live fluoroscopic x-ray guidance (VesselNavigator, Philips Medical, Amsterdam, the Netherlands), a 30-mm Gore Cardioform Septal Occluder device (W.L. Gore, Flagstaff, Arizona) was deployed across the neck of the pseudoaneurysm. Abbreviations as in Figure 1.

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