Treating a Mycotic Ascending Aortic Aneurysm

Isolated endovascular therapy can be performed successfully in appropriate anatomy.

BY ROSS MILNER, MD

The ascending aorta continues to be a challenging region to manage with endovascular therapy. A combination approach of open surgical techniques and endovascular therapy is usually required to exclude an aneurysm appropriately in this location. This article highlights two points: (1) the use of isolated endovascular therapy to treat an ascending aortic pseudoaneurysm in a heart transplant recipient, and (2) the possibility of endovascular therapy to provide a durable result in an infected field.

CASE REPORT

A 51-year-old man underwent an orthotopic heart transplant in April 2002. He was well until July 2003 when he manifested low-grade fevers. Evaluation by computed tomography (CT) revealed a pseudoaneurysm at the donor-recipient aortic suture line (Figure 1). This was promptly repaired by a redo sternotomy and polyester patch. Circulatory arrest and full cardiopulmonary bypass were utilized because this was the third sternotomy for this patient. Although initial blood cultures were negative, cultures from the pseudoaneurysm eventually grew methicillin-resistant *Staphylococcus aureus*. He was treated for 6 weeks with intravenous vancomycin and rifampin. After his course of antibiotic therapy, the patient began to have chest pain, fevers, chills, and sweats. Repeat imaging revealed a recurrent pseudoaneurysm. He was restarted on intravenous vancomycin and rifampin and admitted to the hospital.

On evaluation, the patient appeared ill. He was febrile (101°F), tachycardic (sinus 105), and diaphoretic. An echocardiogram documented no valvular abnormalities and moderate depression of right ventricular function. We concurred with the cardiothoracic surgeons that the patient was too ill to survive redo pseudoaneurysm repair due to the complexity of the surgery.

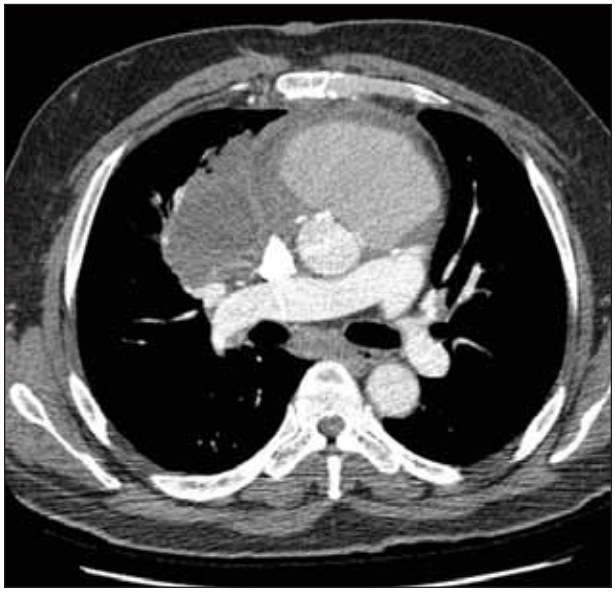

Figure 1. An ascending aortic pseudoaneurysm prior to redo sternotomy for surgical therapy.

Preoperative imaging with CT scan and magnetic resonance angiography (MRA) revealed that the pseudoaneurysm was located midway between the coronary ostia and the innominate artery. The total length of the ascending aorta was approximately 5 cm. The ascending

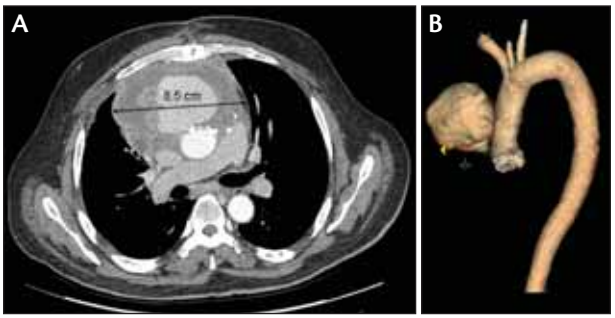

Figure 2. A mycotic ascending aortic pseudoaneurysm that recurred after patch repair of the small defect found at the time of surgery (A). Three-dimensional reconstruction of the CT angiography (B).

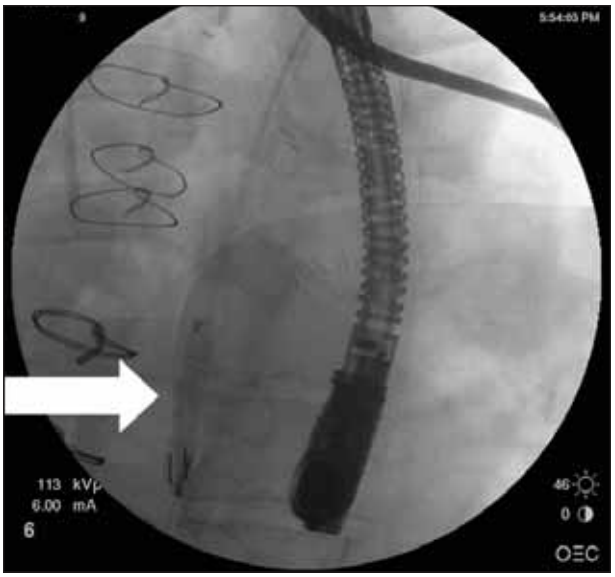

Figure 3. Intraoperative fluoroscopic imaging with TEE assistance. The aortic cuff is in location before deployment (arrow).

aortic diameter, measured by CT scan and magnetic resonance imaging (MRI), was 28 mm.

In September 2003, an arch aortography using the OEC 9800 (GE Medical Systems, Salt Lake City, UT) was performed with a marker pigtail catheter to confirm proximal and distal landing zones, aortic diameters, and location of the pseudoaneurysm. Although angiography was unsuccessful in determining the location of the lesion, transesophageal echocardiography (TEE) proved essential. An anesthesiologist performed the study using a Sonos 5500 (Philips Medical Systems, Bothell, WA) with a 5-MHz Omni 2 multiplane probe (Hewlett-Packard, Palo Alto, CA). Using the TEE, we were able to pinpoint the entry site into the pseudoaneurysm (Figure 2) and measure the ascending aortic diameter as 26 mm.

Figure 4. Three-dimensional reconstruction of the MRA obtained 3 years after treatment.

A left axillary artery cutdown was performed to provide access for the device, and 80 U/kg of heparin was administered intravenously. A 28.5-mm X 3.3-cm Excluder aortic cuff (Gore & Associates, Flagstaff, AZ) was introduced without a sheath into the ascending aorta over a 300-cm Meier wire (Boston Scientific Corporation, Natick, MA). Using real-time fluoroscopy and TEE, the cuff was deployed during a period of cardiac arrest produced by adenosine (Figure 3). Precise deployment over the pseudoaneurysm entry site sealed it instantaneously. When TEE demonstrated no flow in the sac, the wires and catheters were removed.

After the procedure, the patient's hematocrit and creatinine remained stable. Postoperative chest x-ray showed the aortic cuff in place. He was discharged from the hospital 3 days after surgery on intravenous rifampin and vancomycin for an additional 6 weeks. This treatment was followed by daily, lifelong oral trimethoprim-sulfamethoxazole. Follow-up TEE at 3 days and magnetic resonance imaging at 2 months revealed complete resolution of the pseudoaneurysm. At 3-year follow-up, the patient had no recurrent infectious symptoms and demonstrated no recurrence on surveillance MRA (Figure 4).

CONCLUSION

Reports of isolated endovascular therapy of the ascending aorta are limited in the literature. This article demonstrates that the procedure can be performed successfully with the appropriate anatomy. There is growing experience with managing mycotic aneurysms with endovascular techniques, and this is further confirmation of the success of this treatment in a well-selected patient. ■

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