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EDITORIAL COMMENTARY

Eskimos, elephants, and endovascular: Body floss technique for hybrid arch procedures

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See related article on pages 250-2.

Hybrid arch procedures represent a mixed bag of different surgical approaches and endovascular techniques. The first hybrid arch procedure was described by Diethrich and colleagues¹ in 2006. Their approach combined an open surgical component with a concomitant endovascular portion. The open surgical component consisted of a sternotomy, great vessel debranching from the ascending aorta, and then antegrade delivery of an aortic stent graft through a conduit originating off the ascending aorta. With the chest still open, a through-and-through wire was externalized from the conduit to the common femoral artery sheath. Termed “body floss,” this technique facilitates tracking and delivery of the thoracic aortic stent graft around the aortic arch. The technical advantage of this approach is that the tension on the wire can be adjusted by pulling simultaneously on both ends of the wire to facilitate insertion and deployment of the aortic stent graft.

In 2007, Greenberg and associates² reported an alternative approach to hybrid arch procedures, which included surgically replacing the arch with an associated elephant trunk under circulatory arrest. At a subsequent procedure, by means of strictly endovascular techniques, a thoracic aortic stent graft was deployed into the elephant trunk, thus avoiding a left thoracotomy. In this issue of the *Journal*, Kawajiri and colleagues³ describe the use of the body floss technique

to aid in delivering the thoracic aortic stent graft into problematic elephant trunks.

There are several important technical points to highlight regarding their through-and-through brachiofemoral wire technique. This approach is advised in patients with problematic elephant trunks, such as in instances in which the elephant trunk is crumpled or distorted. In these cases, it can be quite difficult to cannulate from below the orifice of the Dacron polyester fabric graft within the descending thoracic aorta because of compression inside a narrowed true lumen or unintentional infolding of the graft. The body floss technique eliminates the difficulty in retrograde cannulation of the elephant trunk by passing a wire antegradely through the elephant trunk from the right brachial artery. After the wire is passed into the abdominal aorta, it is snared from below and externalized through the femoral artery sheath. A similar technique has been described for use in patients with severe tortuosity of the descending thoracic aorta.⁴

Kawajiri and colleagues³ chose to approach the body floss technique from the right brachial artery. This involves crossing the aortic arch with a wire and could increase the risk of stroke. Presumably the arch in these patients is surgically replaced and not involved with atherosclerotic burden. Nevertheless, it is important to screen these patients by computed tomography to ensure that the arch is free of disease. In addition, a catheter must be introduced over the wire to prevent the wire from “cheese grating” the junction between the aorta and ostium of the innominate artery when both ends of the body floss wire are pulled tight. The tension on the wire can traumatize the ostium of the innominate artery, and this risk should therefore be eliminated by keeping a catheter over the wire at the innominate artery–aortic interface.

The left brachial artery is another alternative to the right brachial artery. Technically, the elephant trunk can be cannulated in an antegrade fashion from the left brachial

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artery; as Kawajiri and colleagues³ note, however, the angulation from the left subclavian artery does not work favorably to help the proximal end of the aortic stent graft deploy into the distal aortic arch. If the left brachial artery approach is used, the wire can be prolapsed into the ascending aorta once the thoracic aortic stent graft has been delivered over the body floss wire. This approach, however, does not provide as much control of the proximal graft deployment as does a wire from the right brachial artery.

Kawajiri and colleagues³ elected to remove the brachial femoral wire once the thoracic aortic stent-graft was in place and insert a Lunderquist wire (Cook Medical Inc, Bloomington, Ind). The stiffer Lunderquist wire, when the proximal aspect is placed in the ascending aorta, improved the conformability of the aortic stent graft, which facilitated deployment of the proximal aspect of the graft. The angulation of a wire heading out the innominate artery, as opposed to a stiff wire conforming to the aortic arch, could lead to unintentional bird beaking of the stent graft.

In summary, the brachiofemoral wire, or body floss, technique is another useful tool that all interventionalists need to have at their disposal. This technique is useful in a number of different situations, including hybrid arch procedures with problematic elephant trunks and frozen elephant trunks. It requires expert level familiarity with catheter and wires to be performed safely, and surgeons may want to partner with another specialist as part of the hybrid team for these types of cases.

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Multibranched hybrid device for frozen elephant trunk: What does it change?

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See related commentary pages 255-7.

Introduced in 1996, the frozen elephant trunk is a technique that allows the treatment of degenerative and chronic dissecting aneurysms involving the aortic arch and the proximal descending aorta.¹ During recent years, various hybrid prostheses have been developed. Reported series have shown satisfactory perioperative and midterm results of the frozen elephant trunk.^{2,3} The Thoraflex prosthesis (Vascutek Terumo, Inchinnan, UK) is a new device with selective supra-aortic branches and a sewing collar (Figure 1). We

FIGURE 1. Frozen elephant trunk with Thoraflex (Vascutek Terumo, Inchinnan, UK) multibranched hybrid device.

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