Total aortic arch endovascular repair using an iliac branch device

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A 76-year-old man who 2 years before underwent thoracic endovascular aortic repair for aneurysm of the aortic arch was admitted to our department with dysphonia and dysphagia due to an increasing diameter of aneurysm of the aortic arch because of type Ia endoleak. To obtain an adequate proximal neck for conventional thoracic endovascular aortic repair, the double chimney graft technique was chosen using a hypogastric component of the iliac branch Excluder (W. L. Gore & Associates, Flagstaff, Ariz) for the anonymous trunk. At 1-year follow-up, computed tomography scan showed patent chimney graft and no endoleaks. This is the first report in the literature using a hypogastric branch in the aortic arch. (J Vasc Surg Cases 2016;2:143-4.)

For aortic arch aneurysm, conventional open total aortic arch replacement has long been considered the standard therapy.[1] Hybrid thoracic endovascular aortic repair (TEVAR), with aortic arch debranching and endovascular graft placement, has emerged as an attractive option for high-risk patients.[2] Randomized controlled trials comparing the strategies are not available, so a surgical strategy for aortic arch aneurysm should be chosen on the basis of the patient's characteristics. The Achilles heel of the endovascular approach remains the endoleak that can provoke an increase of the aneurysmal sac.[3] We present a case report with double chimney grafts in the aortic arch using a device designed for the iliac branch.

Institutional Review Board approval and patient consent to publish the data were obtained.

CASE REPORT

A 76-year-old man was admitted to our department with dysphonia and dysphagia. He had undergone TEVAR 2 years earlier for aneurysm of the aortic arch (Fig 1), left subclavian artery embolization with Amplatzer vascular plug (St. Jude Medical, St. Paul, Minn), and left common carotid bare-metal stent to preserve carotid flow (Fig 2). The patient was assigned to American Society of Anesthesiologists class 4, and the risk evaluation according to the European System for Cardiac Operative Risk Evaluation (EuroSCORE II) was 6.18. Urgent computed tomography (CT) showed an increasing diameter of an aneurysm of the aortic arch because of type Ia endoleak. To obtain an adequate proximal neck for conventional TEVAR, the double chimney graft technique was chosen as an option. Under general anesthesia through left side of the neck and right subclavicular incisions, the left common carotid artery and right axillary artery were exposed. An 8- × 10-mm Viabahn stent graft (W. L. Gore & Associates, Flagstaff, Ariz) through a carotid approach and a hypogastric component of the iliac branch Excluder (W. L. Gore & Associates) through a 12F sheath into the axillary artery were then inserted into the ascending aorta. Simultaneously, a conformable thoracic aortic graft (CTAG; W. L. Gore & Associates) was introduced through the common femoral artery. Next, rapid left ventricular pacing with reduction of systolic blood pressure (<60 mm Hg) was applied to prevent bloodstream-induced dislocation of the grafts. The CTAG was then deployed, directly followed by the deployment of the chimney grafts, which was completed by balloon modeling.

Fig 1. Computed tomography (CT) rendering of aneurysm of the aortic arch.

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Fig 2. Computed tomography (CT) reconstruction showing endoleak after aortic arch stent graft, left subclavian artery embolization with Amplatzer vascular plug, and left common carotid bare-metal stent.

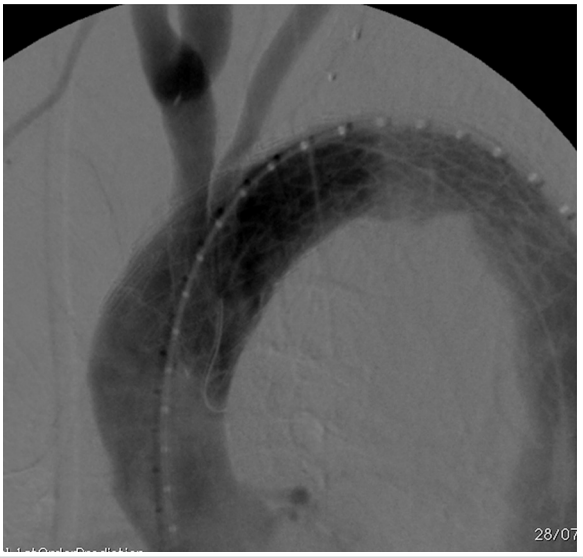

Fig 3. Final angiogram showing patency of chimney grafts and complete resolution of endoleak.

A final angiogram showed patency of chimney graft and complete resolution of endoleak (Fig 3). Postoperative CT scan showed no endoleaks and patency of the grafts (Fig 4). The postoperative course was uneventful, and the patient was discharged at day 8. At 1-year follow-up, CT scan showed patent chimney grafts and no endoleaks.

DISCUSSION

The chimney graft technique in the aortic arch is reported to be associated with low mortality rates despite risk of stroke and endoleaks at follow-up due to an inadequate seal between chimney graft, aortic stent graft, and aortic wall (gutters).[4,5] In our case, because of the patient's comorbidities and urgent condition, the double

Fig 4. Postoperative computed tomography (CT) rendering of thoracic endovascular aortic repair (TEVAR) and double chimney grafts of aortic arch: iliac branch Excluder for anonymous trunk and Viabahn for left common carotid artery.

chimney technique was preferred. To obtain a good seal between the chimney stent graft and the artery for the size of the anonymous trunk (usually >10 mm), the hypogastric component of the Excluder iliac branch endoprosthesis could be a good solution because of its 16-mm proximal diameter. This is the first report in the literature using a hypogastric branch in the aortic arch.

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