SHORT REPORT

Internal Iliac Artery Branch Graft for Common Iliac Artery Aneurysm Following Previous Open Abdominal Aortic Aneurysm Repair


Regional Vascular Unit, and Department of Interventional Radiology, Cambridge University Hospitals NHS Trust, Box 201, Addenbrooke’s Hospital, Hills Road, Cambridge CB2 2QQ, UK

To demonstrate the use of a commercially available branch stent graft system, designed to preserve the internal iliac artery (IIA) in common iliac artery (CIA) aneurysms (CIAA) in two patients, who had undergone previous abdominal aortic aneurysm (AAA) surgery.

Keywords: Abdominal aortic aneurysm; Common iliac aneurysm; Internal iliac artery branch graft; Endovascular repair; Hostile abdomen.

Introduction

We report two patients presenting with bilateral CIA and IIA aneurysms (IIAA) after previous open AAA surgery who were managed endovascularly using the IIA branch device (William Cook Inc., Brisbane, Australia) to preserve pelvic circulation.

Case 1

A 67-year-old man was referred with a hernia and found to have an incidental aneurysm. Past medical history included elective AAA tube graft repair in 1993 and COPD. A computed tomography (CT) scan showed an 8 cm right CIAA, 3.7 cm left CIAA and a 2.5 cm right IIAA (Fig. 1A).

The branch graft is a modular device that extends the available Zenith Cook AAA bifurcated graft to preserve the ipsilateral IIA circulation. It was decided to deploy the branch graft in the left CIAA as the right CIAA was larger (8 cm vs. 3.7 cm), had extensive thrombus and an IIAA. This right IIAA was coil embolised, the day before stenting.

The technique for insertion of the device is described elsewhere but briefly involves ipsilateral device insertion and contralateral femoral Balkin 8F sheath insertion which crosses over the aortic bifurcation to deploy a covered stent graft (Atrium Advanta V12 (in this case a 38 mm × 10 mm)) through the IIA Branch to secure a seal in the IIA (Fig. 1B).

The branch graft is licensed to be used only with the AAA endograft and hence the procedure was completed by placing a bifurcated AAA stent-graft (William Cook Europe) and subsequently bridging the gap to the IIBD with a Zenith limb extension (Fig. 1C).

Operative time was 3 hours (58 minutes fluoroscopy) and 300 mls of contrast was used. The patient was discharged on day 2. At 10 months follow-up the patient is well and has a patent graft and no endoleak.

Case 2

A 76-year-old man, under renal investigation had a CT which demonstrated, incidental bilateral CIAA. Past medical history included elective AAA tube graft...
repair in 1996 and myocardial infarction in 1995. The CT demonstrated a 5 cm right and 3.5 cm left CIAA, with 3.5 cm right and 2.7 cm left IIAA (Fig. 2A).

A decision to deploy the branch stent in the left CIAA was made as it was smaller and had less thrombus. Though a 2.7 cm left IIAA was present, a distal landing zone was available. The right IIA was embolised the day before surgery. Deployment was initially as described above; however, a type 1 endoleak via the distal IIA limb was noted on completion angiography after insertion of the aortic bifurcated body. It was not possible to re-pass the Balkin sheath over the aortic bifurcation because of the acute angle between the 2 limbs of the aortic graft. Therefore, a further 38 mm × 10 mm Advanta V12 stent was inserted via a left brachial approach to extend the stent-graft

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Fig. 1. (A) Preoperative CT reconstruction. (B) Balloon expansion of the Advanta IIA covered stent graft through the IIA branch. (C) Completion angiogram.

Fig. 2. (A) Preoperative CT reconstruction. (B) Completion angiogram having had the extended Advanta V12 stent due to initial endoleak.
further into the IIA and successfully seal the endoleak (Fig. 2B). Operative time was 4.5 hours (75 minutes fluoroscopy, 320 mls contrast) and discharge on day 2. At 10 months follow-up the patient is well, the IIA branch is patent with no endoleak on CT.

Discussion

The previous descriptions of IIA branch grafts have included custom made devices however; the Cook branch stent-graft is an off-the-shelf device.

Other treatment strategies described for the treatment of bilateral CIAA include bilateral IIA coverage with grafts deployed in the EIA or large “bell-bottom” CIA grafts. However, bilateral IIA embolisation should generally be avoided due to the risks of buttock, spinal cord or, bowel ischaemia and oversized grafts risk further aneurysm dilatation.

Descriptions of this branch graft in aortoiliac disease exist. In this report however, the patients presented after previous AAA tube repair and had unilateral branch grafts (though bilateral devices can be deployed). Endovascular repair has well established benefits in hostile surgical fields.

This branch device is available in varying sizes and must be deployed with a Zenith Cook AAA graft for stability. The limitations/anatomical requirements specific to branch grafts are primarily to have a CIA diameter of greater than 2.0 cm above the IIA origin (to allow the branch device to open) and a landing zone in the distal IIA.

The IIA branch graft is a device that allows preservation of the IIA during EVAR in patients with aortoiliac aneurysms and was particularly attractive these cases due to the hostile surgical fields and complex common and internal iliac aneurysms. Data on the long-term durability of these devices is required.

References


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