

Fenestrated Anaconda™ Custom AAA Stent Graft System for Pararenal Aortic Aneurysmal Disease

How the novel features of this device can optimise results in challenging pararenal aortic aneurysm cases.

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The management of juxtarenal and/or pararenal aortic aneurysmal disease remains a challenge, with open surgical morbidity and mortality rates that are increased threefold compared to standard infrarenal aortic repair.¹ Only recently have endovascular strategies been developed to expand the indications for endovascular aortic repair in the juxtarenal/pararenal vascular beds. Early innovators expanded the use of commercially available devices to include novel strategies, such as snorkel or chimney techniques, or on-table fenestrations to allow for endovascular repair. These off-label uses have demonstrated short-term success but can be associated with significant long-term failure and reintervention rates.² Although chimney or parallel graft technique outcomes continue to improve, fenestrated endovascular repair of juxtarenal aortic aneurysms has demonstrated similar outcomes to open repair, with reductions in peri-operative mortality and morbidity, as well as length of hospital stay.³ The Fenestrated Anaconda™ Custom AAA Stent Graft System (Vascutek Ltd.) has been uniquely configured to allow safe placement of endovascular devices in

the juxtarenal/pararenal location and has demonstrated excellent short-term results.⁴ Next, we present a case report that illustrates pararenal deployment with the Fenestrated Anaconda™ Custom AAA Stent Graft System.

CASE REPORT

A 68 year old man was referred to our centre for management of a symptomatic, 5.6 cm abdominal aortic aneurysm with an absent infrarenal aortic neck, reverse-tapered pararenal configuration, and 90° anteroposterior angulation (Figure 1). The patient was deemed to be an unsuitable anatomic candidate for standard infrarenal aortic repair and was classified as high risk for open repair due to his comorbidities, including hypercoagulable syndrome (lupus anticoagulant positive), abdominal obesity, and a hostile abdomen due to multiple previous laparotomies (diverticular disease). His anatomy was reviewed by the planning team for fenestrated repair, and he was approved for device prototype manufacture. After mock deployment with the prototype in the 3D anatomical model was completed, he was fast-tracked

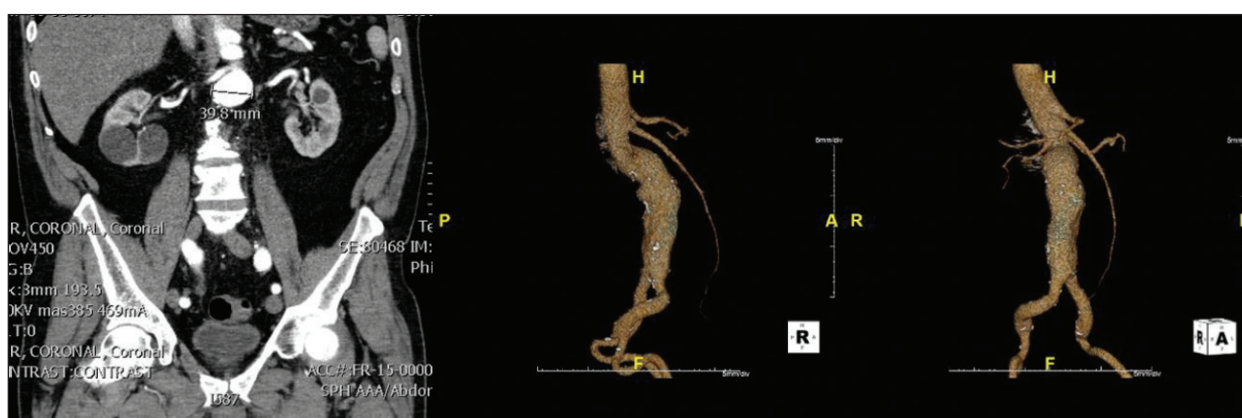


Figure 1. Pararenal aortic aneurysmal disease with an absent infrarenal neck and a short distance (< 10 mm) between the renal and visceral artery branches.

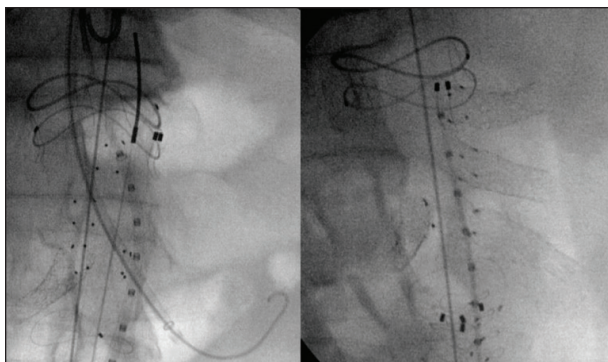


Figure 2. Intra-operative visceral branch access from the left axillary artery. All branch vessel stents in position after main body deployment (right).

for device production and was brought to the operating room 4 weeks after initial planning submission. Due to the absent infrarenal neck and the relative crowding of the perivisceral segment vessels, a four-branch fenestrated device was used.

Intra-operative challenges included the patient's obesity and the acute downward angulation of the renal arteries. Left axillary arterial access was achieved via ultrasound, and a 7 F, 80 cm Destination sheath (Terumo Interventional Systems) was placed into the descending thoracic aorta to allow for selective cannulation. Bilateral common femoral arterial access was achieved via percutaneous ultrasound guidance, and "preclosure" was completed with a Perclose ProGlide device (Abbott Vascular). Branch arteries were selectively catheterised and stented from above, starting with the coeliac axis and working downward to the renal arteries. Advanta V12 stents (Maquet Medical Systems) were utilised to sequentially stent each branch vessel, with postdeployment dilation using non compliant balloons to ensure proper mating to the stent graft fenestrations (Figure 2).

Completion aortography performed while the patient was fully anticoagulated demonstrated a late type II endoleak. Percutaneous closure devices were used to complete the arteriotomy repairs, with a total operative time of 180 minutes and a fluoroscopy time of 23 minutes (Figure 3).

The patient was discharged on the second post-operative day, with dual-antiplatelet therapy to ensure branch vessel patency. CT imaging at 1 and 2 year follow-up demonstrated no signs of residual endoleak, with marked reduction in aneurysm sac size and wide patency of all branch target vessel stents (Figure 4).

DISCUSSION

The Fenestrated Anaconda™ Custom AAA Stent Graft System has revolutionised the treatment of juxtarenal



Figure 3. Completion aortogram demonstrating wide patency of all branch vessels and a delayed type II endoleak.



Figure 4. Two year follow-up CT scan demonstrating wide patency of all target vessels. The aneurysm sac has almost completely regressed.

and pararenal aortic aneurysmal disease. The O-ring with unsupported body stent design eliminates the constraints on fenestration placement that is associated with the Z-stent design and allows for full customisation to patient anatomy and reduced seal zone length requirements. The device's retractable constraining collar and

minimally supported fabric allows for repositioning of the device during sequential cannulation, which markedly improves the ability to align fenestrations with branch vessels. Each branch can be selectively cannulated and stented before moving on to the next, which shortens cannulation times, reduces radiation exposure, and eliminates sheath and wire crowding inside the main body of the device.

As well as incorporating novel features inherent on standard Anaconda™ devices, such as the magnet wire cannulation system for the contralateral gate that also shortens operative times, there are a number of potential customisable options for Fenestrated Anaconda™ devices. These include additional wire supports for the fenestrations to prevent fabric “rucking” or folding in certain situations where, at the planning stage, there is increased risk of interference with cannulation as well as tapered or flared devices with differing device diameters to accommodate narrow aortic regions or allow for placement in fully aneurysmal pararenal segments. ■

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