

CASE REPORT

Endovascular Aneurysm Sealing for Management of Aortic Occlusive Disease

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Introduction: Endovascular management of aortic occlusive disease is an alternative to open surgery. This case describes the use of a Nellix graft to treat infrarenal aortic stenosis, outwith the graft indication for use.

Case report: A 71 year old man with multiple comorbidities, presented with bilateral buttock claudication. A computed tomography angiogram (CTA) showed significant infrarenal aortic stenosis. Under local anaesthetic, using a percutaneous approach, Nellix grafts were inserted. The patient was discharged within 24 hours. His claudication improved significantly. A 6 month follow-up CT showed stent patency.

Conclusion: Although further research is necessary, this case suggests that Nellix is safe and effective for primary stenting of the stenotic infrarenal aorta.

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INTRODUCTION

Aortobifemoral bypass or aortic endarterectomy is the preferred treatment for aortic occlusive disease in most UK centres as the long-term results of endovascular intervention are inferior to open surgery.¹

Endovascular intervention has been proposed as an alternative to surgery, especially in high risk patients with multiple comorbidities.^{2,3}

There are various endovascular options to manage aortic occlusive disease; however, in long lesions, more than one stent is usually needed to provide a good outcome.

The Nellix system consists of two identical catheter based devices with a 10 mm flow lumen being created by two balloon expandable polytetrafluoroethylene covered cobalt–chromium stents. The stents are surrounded by polyurethane endobags. The system is used for the repair of abdominal aortic aneurysm and incorporates an endobag to prevent type 2 endoleak.

In this case, the Nellix endovascular aneurysm sealing (EVAS) system was used as a novel technique for managing aortic occlusive disease outside the instructions for use (IFU).

Case Report

A 71 year old man with significant cardiopulmonary comorbidity presented to the outpatient clinic with bilateral 20 metre buttock claudication.

Physical examination showed absent femoral pulses, capillary refill of 4 seconds on both lower limbs, and an ankle brachial pressure index (ABPI) of 0.56 on the right and 0.6 on the left.

A computed tomography angiogram (CTA) revealed a significant infrarenal aortic stenosis (Fig. 1).

The patient was initially treated conservatively with the best medical therapy in the form of an antiplatelet, a statin, and a supervised exercise programme but with no improvement. He then started to develop rest pain in his left foot.

The multidisciplinary team discussion recommended that an endovascular option would be safer because of his multiple comorbidities and the high risk of undergoing a general anaesthetic.

The patient consented and was informed about other endovascular alternatives. He was also aware of using the Nellix graft for the first time in aortic occlusive disease outside the IFU, and the potential risks including graft migration and aortic rupture.

Under local anaesthetic, bilateral ultrasound guided retrograde puncture of both common femoral arteries was performed. Two Proglide closure devices were inserted on each side. An initial diagnostic angiogram was performed to confirm the length of stents required (Fig. 2).

Two 10 × 150 mm Nellix grafts were inserted. After retracting the covering sheaths, the stent grafts were deployed by simultaneous inflation of the balloons within the stents to 7 atm. A polymer (20 mL) was injected per graft with careful monitoring of the endobag pressure making sure not to exceed 200 mmHg (Fig. 3).

Completion angiography showed a satisfactory result (Fig. 4), with good femoral pulses at the end of the procedure.

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Figure 1. CTA showing significant long infrarenal aortic stenosis.

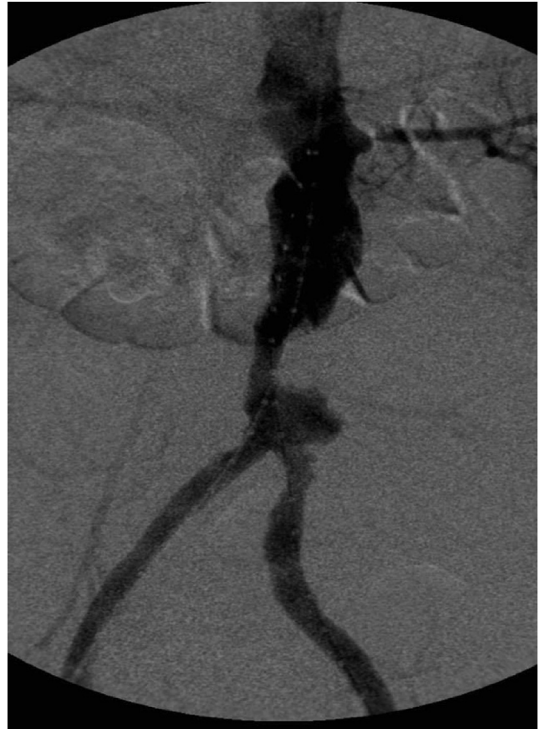


Figure 3. Angiogram showing severe stenosis of the distal aorta.

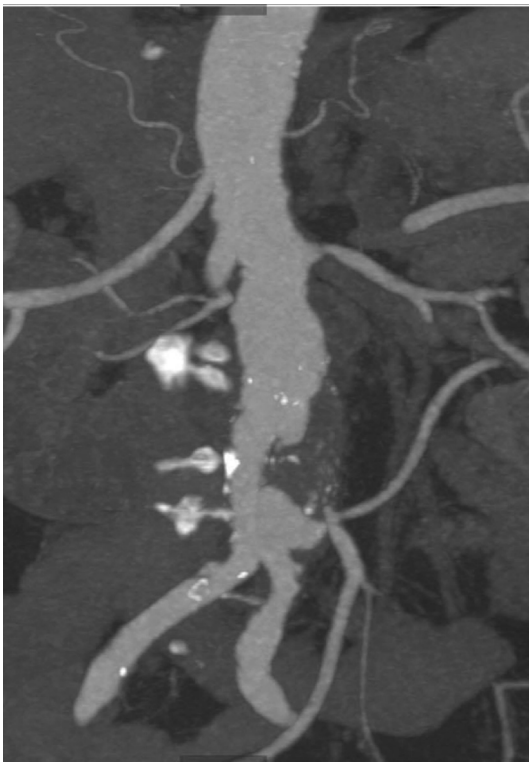


Figure 2. CTA showing significant long infrarenal aortic stenosis.

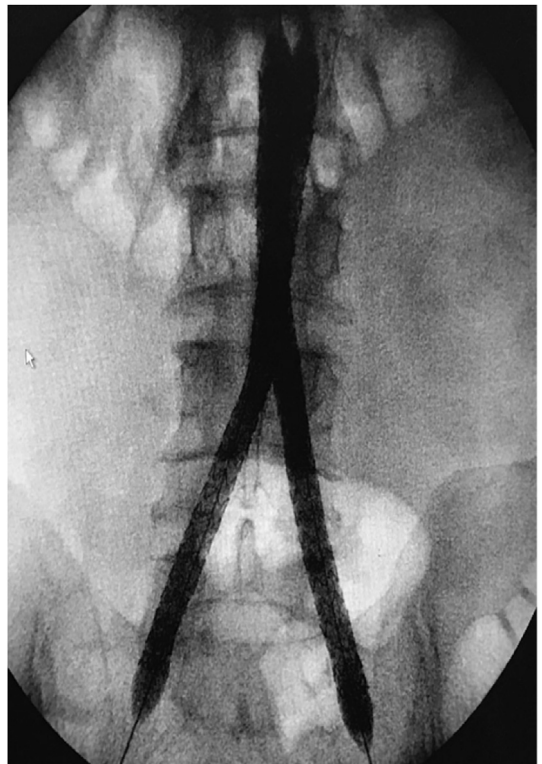


Figure 4. Nellix Balloon inflated to open the stent; polymer (20 mL) is injected in each limb.

An uneventful recovery followed with discharge within 24 hours. A 6 month follow-up CTA showed patent stents with no migration (Fig. 5). Technical success was accompanied by clinical resolution of symptoms with an increase in ABPI to 0.9 on the right lower limb and 0.85 on the left side (see Fig. 6).

DISCUSSION

Aortobifemoral bypass has long been the gold standard for management of aorto-iliac occlusive disease with a 10 year patency rate of 80–90% and a peri-operative mortality of

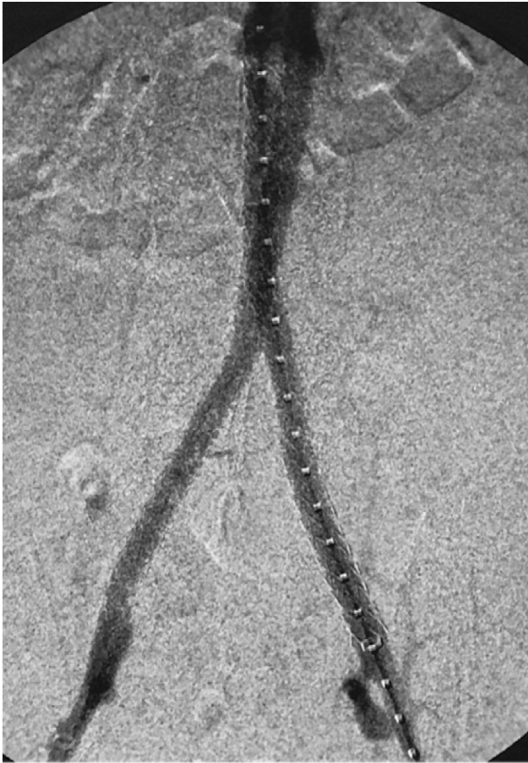


Figure 5. Completion angiogram showing a good radiological outcome.

1–3%.⁴ However, the endovascular approach has a primary patency rate of 60–86% at 5 years with peri-operative mortality of 1%.⁵

In patients with significant comorbidities that preclude open repair, endovascular options are preferred.

Palmaz, Atrium Advanta V12, and the covered endovascular reconstruction of aortic bifurcation (CERAB technique) are commonly used for management of isolated aortic occlusive disease.

In this case, the length of the aortic stenotic lesion was approximately 10 cm and treatment using the Atrium Advanta V12 would require at least three to four stents to treat the long lesion, or using the CERAB technique.

Instead the Nellix EVAS system was used as a novel technique outside the IFU.

The Nellix graft is designed for treating abdominal aortic aneurysms but the fact that it is a balloon expandable covered stent with reasonable radial force and provided in various lengths makes it suitable for management of long aorto-iliac occlusive lesions without the need for extra stents.

The CERAB technique and Atrium Advanta V12 stents will require more manipulations with wires, catheters, stents, and also cannulation of the contralateral limb in the CERAB technique, which might lead to an increased risk of embolisation. The Nellix graft may reduce that risk as, once the stent is deployed, there is no need for any further cannulation or extra stents.

The advantages of using the Nellix graft include fewer technical difficulties, less endovascular manipulation, and in



Figure 6. Six month follow-up CTA showing the patent stent. Technical success was accompanied by clinical resolution of symptoms.

turn less risk of embolisation, shorter operation time, and less radiation exposure.

The main disadvantage for using the device is that it is more expensive than any other technique.

Another concern is stent migration for which a yearly follow-up using plain radiography has been arranged.

CONCLUSION

Although further research is necessary, this case suggests that Nellix is a feasible alternative technique for primary stenting of the stenotic infrarenal aorta in selected cases.

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CONFLICT OF INTEREST

None.

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