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CASE REPORT

Ilioprofunda Endobypass Can Successfully Treat a Post-Operative Femoral Pseudo-Aneurysm

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Introduction: A 75-year-old male patient with significant cardiopulmonary comorbidity presented with a 70-mm left femoral pseudoaneurysm 6 years after aortobifemoral bypass (and prior femoral endarterectomy).
Report: As the left superficial femoral artery was occluded, an ilioprofunda endobypass was undertaken following extraperitoneal exposure of the left limb of the bypass graft with subsequent deployment of four Viabahn endoprostheses via the left limb into the proximal left deep femoral artery with successful exclusion of the pseudoaneurysm. The endografts remain patent at 6 months with regression noted in the pseudoaneurysm itself.
Discussion: Post-operative femoral pseudoaneurysm following anastomotic dehiscence has traditionally been treated by open surgical repair. Re-re-do open femoral vascular surgery has a high complication rate. Scarring and potential graft infection may necessitate ligation of involved arteries and extra-anatomic bypasses with an attendant risk of limb loss. Although the common femoral artery is conventionally contraindicated for endograft deployment because of the perceived high risk of stent fracture in a highly mobile zone, an endobypass can avoid the potential complications of open revision groin surgery in an unfit, high-risk patient.

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INTRODUCTION

Post-operative femoral artery pseudoaneurysm following anastomotic dehiscence has traditionally been treated by open surgical means. Re-re-do open vascular surgery in the scarred groin of an unfit patient has an attendant high local complication risk, sometimes necessitating ligation of the artery with extra-anatomical bypass, which carries a finite risk of limb loss, notwithstanding the potential for anaesthetic complications. This study presents the case of a 75-year-old patient with a femoral pseudoaneurysm 6 years following aorto-bifemoral bypass, treated successfully with endovascular stent-grafting, avoiding the need for open redo groin surgery and minimising the complications thereof.

CASE REPORT

A 75-year-old male initially presented in 2009 with short distance lower limb intermittent claudication (IC), initially treated by a femoral endarterectomy with patch reconstruction and appropriate medical therapy including

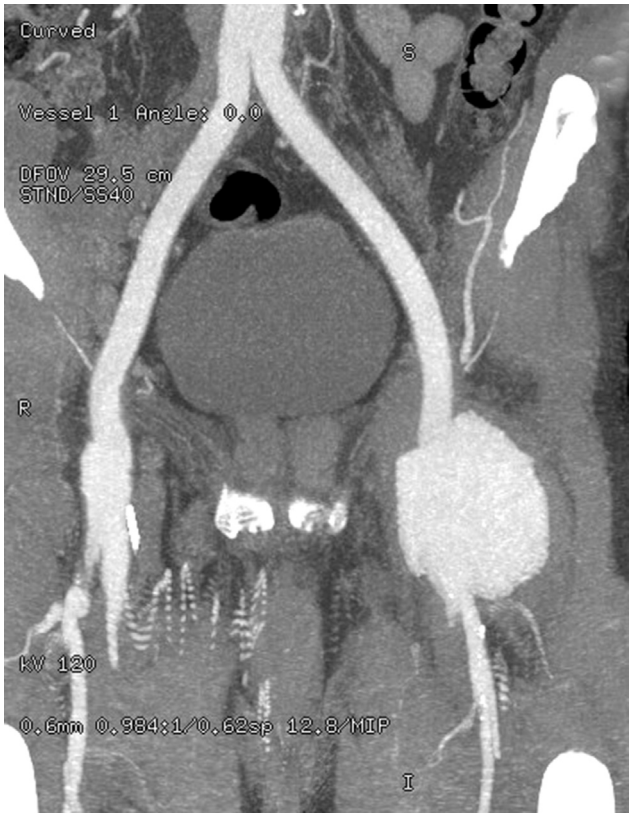

Figure 1. CTA indicating the 70 mm left femoral pseudoaneurysm.

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antiplatelet and lipid-lowering medication. He continued to smoke and re-presented with IC. Repeat imaging showed an ipsilateral iliac stenosis which was successfully stented. However, the patient continued to smoke and he presented again in 2010 with critical left lower limb ischaemia (rest pain), on this occasion because of occlusion of the ipsilateral common (CIA) and external iliac (EIA) arteries along with a contralateral CIA stenosis. He therefore underwent aorto-bifemoral bypass grafting. Post-operative recovery was complicated by compartment syndrome requiring fasciotomy, sepsis, and cardiac complications. The patient was successfully discharged after a prolonged hospital stay.

His most recent presentation in 2016 was with sudden-onset left groin pain with a pulsatile mass therein. Computed tomography angiography (CTA) showed a large (70 mm) pseudoaneurysm (psA) arising from the left groin anastomosis (Fig. 1). The patient had continued to smoke and was now extremely high risk with significant cardiorespiratory comorbidities. The superficial femoral artery (SFA) was chronically occluded and therefore, in the absence of any overt groin infection, it was felt that an endovascular approach to achieve psA exclusion and maintain lower limb perfusion via the deep femoral artery (DFA), which was patent, would be both prudent and appropriate.

Under combined spinal-epidural anaesthesia, a left iliac fossa extraperitoneal approach was used to expose the distal aspect of the left limb of the aortobifemoral graft. A long 12F sheath (Dry-Seal, WL Gore & Associates Inc., Medical Products Division, Flagstaff, AZ, USA) was employed to maintain intravascular access via the graft limb. Subsequently, four heparin-bonded endoprostheses (Viabahn, WL Gore & Associates Inc.; 9 × 50 mm, $n = 1$, 10 × 50 mm, $n = 1$, 11 × 50 mm, $n = 1$, 13 × 50 mm, $n = 1$) were deployed building from distal to proximal, commencing in the proximal DFA, bridging across the common femoral artery (CFA) to seal proximally within the graft limb (Fig. 2A and B). A 2 cm distal landing zone was achieved without sacrificing significant DFA branches, and all overlaps were kept at a minimum of 2 cm, with successful exclusion of the psA (Fig. 2C). The patient was discharged home the following day on lifelong dual antiplatelet therapy and post-procedure CTA has shown that the false aneurysm remains excluded (Fig. 3). The patient remains well at 6 months under a graft surveillance programme with no reported complications.

DISCUSSION

False aneurysm formation after aortobifemoral reconstructions is a recognised problem in the long term,[1] with a possible relation to ongoing smoking.[2] Traditionally, psA occurrence following open surgery has been managed by open surgical techniques.[3] In the patient described, open

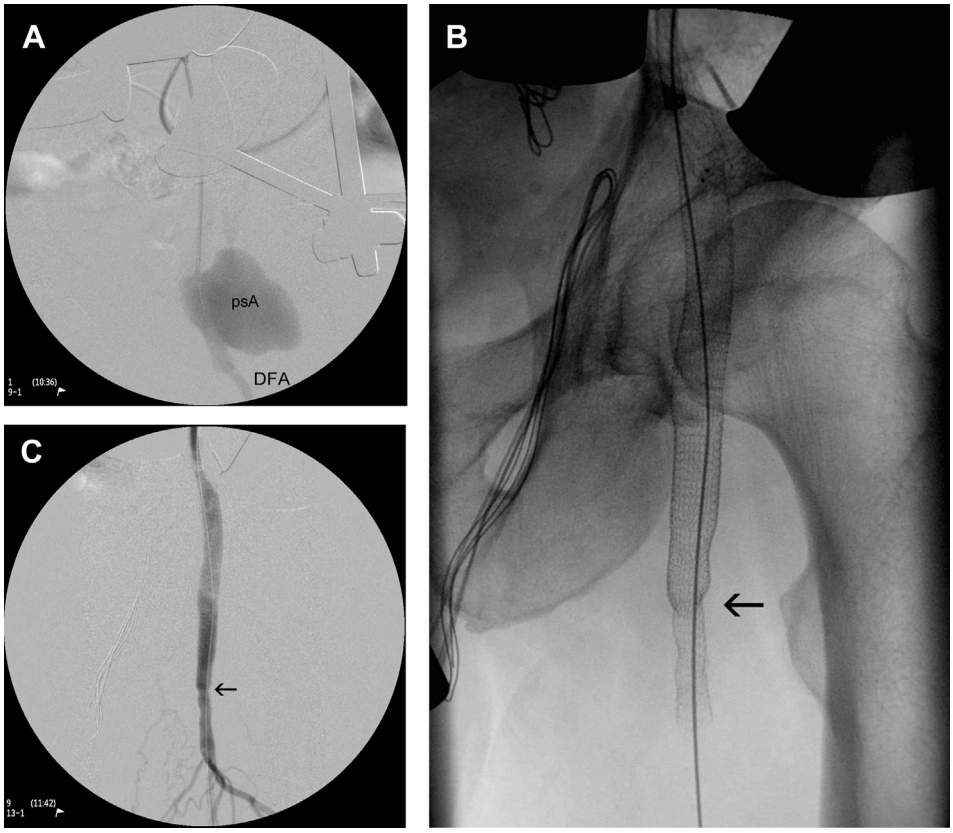

Figure 2. (A) Angiogram indicating the pseudoaneurysm and the outflow via the DFA. (B) Screenshot of the four endoprostheses after deployment. (C) Completion angiogram indicates successful pseudoaneurysm exclusion and PFA outflow with proximal branch preservation (arrow = transition zone from CFA to DFA).

Figure 3. Post-procedure CTA (right anterior oblique perspective) indicating good position of the endoprostheses with no endoleaks noted.

repair of the false aneurysm in the femoral anastomosis would likely be a very difficult operation given the scarred nature of the groin (two previous operations) with significant risk of complications typified by lymphatic,[4] infective[5] problems, recurrent psA formation,[2,6] and indeed mortality.[2] Similarly, given the size of the psA and the likely cause being suture dehiscence, interventional approaches such as thrombin injection would not be a viable option.

Groin exploration necessitates either a local or extra-anatomic reconstruction, as ligation of the left limb of the aorto-bifemoral bypass alone - as the only option at open surgery - to effectively control the false aneurysm would carry a high risk of limb loss. Endovascular exclusion of the false aneurysm using covered stents was successfully completed with minimal dissection and low morbidity preserving the limb, and will hopefully prevent recurrence as no surgical repair has been undertaken therefore there is no suture line to dehisce. However, the risk of stent fracture remains a consideration in this area, and necessitates surveillance. Such interventions are now being described even for infected groin psAs.[7] These papers indicate that it is likely that more stent-grafting will be undertaken in the CFA and an idea of the long-term complications thus will be gleaned from a collective analysis of such experience. This case also highlights an alternative access option via the left groin extraperitoneal approach, thus precluding upper limb approaches (including when upper limb access is not available or feasible) which have been previously described,[6] with the added advantage of providing inflow for an extra-anatomic bypass if the endobypass could not be successfully undertaken.

A significant planning issue was the size discrepancy between the graft limb and the DFA. Therefore a tube had to be constructed factoring in a taper from the 12 mm (inner diameter) iliac limb to the DFA, which measured just in excess of 7 mm. The Instructions for Use for the Viabahn endoprosthesis only permit a 1 mm discrepancy between successive endografts (to avoid material rucking), the exception being putting a 13 mm device into an 11 mm device as there is no 12 mm Viabahn. Therefore, a gradually tapering tube was effectively constructed using a four-endoprosthesis approach.

The scope of using combined open and endovascular means to tailor management strategies for the individual patient in this scenario has the advantage of a successful outcome with minimal morbidity and possibly preserving the patient's quality of life, although the theoretical risk of late prosthetic infection remains; thus, within the current timeframe this represents a safe bridging intervention for the short-to-intermediate term (also a reason for keeping such patients on surveillance). In this particular case, SFA occlusion simplified the treatment stratagem, but treatment options would have been complicated if SFA outflow maintenance was required, and certainly the use of parallel endoprostheses would have been a consideration, although this has not really been explored in this area. It is recommended that such a hybrid approach is considered for (particularly unfit) patients requiring urgent vascular attention for large symptomatic femoral pseudoaneurysms.

CONFLICT OF INTEREST

AC is a consultant for Gore.

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REFERENCES

1 van den Akker PJ, Brand R, van Schilfgaarde R, van Bockel JH, Terpstra JL. False aneurysms after prosthetic reconstructions for aortoiliac obstructive disease. *Ann Surg* 1989;**210**(5):658—66.

2 Demarche M, Waltregny D, van Damme H, Limet R. Femoral anastomotic aneurysms: pathogenic factors, clinical presentations and treatment. A study of 142 cases. *Cardiovasc Surg* 1999;**7**(3):315—22.

3 Sharma NK, Chin KF, Modgill VK. Pseudoaneurysms of the femoral artery: recommendation for a method of repair. *J R Coll Surg Ed* 2001;**46**(4):195—7.

4 Tyndall SH, Shepard AD, Wilczewski JM, Reddy DJ, Elliott Jr JP, Ernst CB. Groin lymphatic complications after arterial reconstruction. *J Vasc Surg* 1994;**19**(5):858—64.

5 Piffaretti G, Mariscalco G, Tozzi M, Rivolta N, Castelli P, Sala A. Predictive factors of complications after surgical repair of iatrogenic femoral pseudoaneurysms. *World J Surg* 2011;**35**(4):911—6.
6 Orimoto Y, van Keulen JW, Waasdorp EJ, Moll FL, van Herwaarden JA. Treatment of a recurrent false aneurysm of the femoral artery by stent-graft placement from the brachial artery. *Ann Vasc Surg* 2011;**25**(6):841.e1—4.
7 Fu Q, Meng X, Li F, Wang X, Cheng J, Huang W, et al. Stent-graft placement with early debridement and antibiotic treatment for femoral pseudoaneurysms in intravenous drug addicts. *Cardiovasc Intervent Radiol* 2015;**38**:565.