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Open repair with resection and reimplantation for popliteal artery aneurysm

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ABSTRACT

Popliteal artery aneurysms are the most frequent type of peripheral arterial aneurysm and can be repaired by either open or endovascular techniques. An 81-year-old man presented with leg swelling and during duplex ultrasound examination was diagnosed a popliteal aneurysm. The transverse diameter was 3.6 × 4.5cm, length 2.8cm, one run-off vessel patent. The popliteal aneurysm was asymptomatic for clinical signs of limb ischaemia. We opted for an open surgical repair through a posterior approach. During dissection of the popliteal artery above and below the aneurysm, the two non-diseased popliteal extremities appeared to be very close, leading to the decision to perform an end-to-end anastomosis between the two arterial extremities. The patient was discharged after three days with no adverse events. Follow-up consisted of duplex ultrasound examination at one, three and six months, and then annually. At the six-month follow-up there was no restenosis at the anastomosis.

KEYWORDS

Popliteal aneurysm – Posterior approach

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Background

Popliteal artery aneurysms are uncommon, but if they are symptomatic they represent a high risk of limb loss.[1] Popliteal artery aneurysms can be repaired by either open or endovascular techniques.[2] Open repair consists of a femoropopliteal bypass or replacement of the aneurysmal artery with a graft. Open reconstruction is done through a medial or a posterior approach.

We present a case of open reconstruction by posterior access without the need for a graft. Written informed consent was obtained from the patient for publication of this report and accompanying images.

Case history

An 81-year-old man presented with leg swelling. Duplex ultrasound and computed tomography were used to investigate suspected deep vein thrombosis and a popliteal aneurysm was found. The transverse diameter was 3.6 × 4.5cm, length 2.8cm, with one run-off vessel patent (Fig 1). The popliteal aneurysm was asymptomatic for clinical signs of limb ischaemia. Comorbidities consisted of atrial fibrillation, hypertension and a previous history of smoking.

We opted for an open surgical treatment using a posterior approach with the patient in the prone position under spinal anaesthesia. During dissection of the popliteal artery above and below the aneurysm the two non-diseased popliteal extremities appeared to be very close (Fig 2). We decided t remove the aneurysm sac and to perform an end-to-end anastomosis between the two arterial extremities.

There were no intraoperative or postoperative complications. Length of hospital stay was three days. Follow-up consisted of duplex ultrasound examination and was scheduled at one, three and six months, and then annually. At the six-month follow-up, there was no restenosis at the anastomosis.

Discussion

The incidence of popliteal artery aneurysm is 0.1–1%, and the condition accounts for over 70% of peripheral artery aneurysms.[1] Almost 50% of patients present with symptoms of a thrombosed aneurysm. Distal embolisation carries a high risk of limb loss.[1] Rupture is a rare event.

Popliteal artery aneurysms have traditionally been treated using an open approach; more recently endovascular repair has become popular.[2,3] Poor runoff is considered the main predictor of graft thrombosis as reported in the literature and in our experience.[4,5] In this case, we excluded the endovascular approach because of the poor runoff, which consisted only of the peroneal artery, and the short extension of the aneurysm (less than 3cm) requiring a short covert stent to be deployed across the knee joint.[6]

In the open procedure, the aneurysm is repaired using a medial or posterior approach.[7] Considering the short extension of the aneurysm we decided on a posterior approach. However, this approach requires interposition of a short graft, which might be a vein or a prosthetic graft. We noted during the dissection of the proximal and distal popliteal artery that sufficient mobilisation was possible to allow the fashioning of an end-to-end anastomosis between the two non-diseased popliteal extremities. Mobilisation of the two popliteal extremities is essential, and it can also be used in specific cases such as in the case of a short popliteal artery aneurysm. The advantage of this approach is the avoidance of the use of a prosthetic graft, sparing of the great saphenous vein, with one anastomosis and a shorter operation time.

Figure 1 Popliteal aneurysm was found with transverse diameter was 3.6 × 4.5cm, length 2.8cm, and one run-off vessel patent.

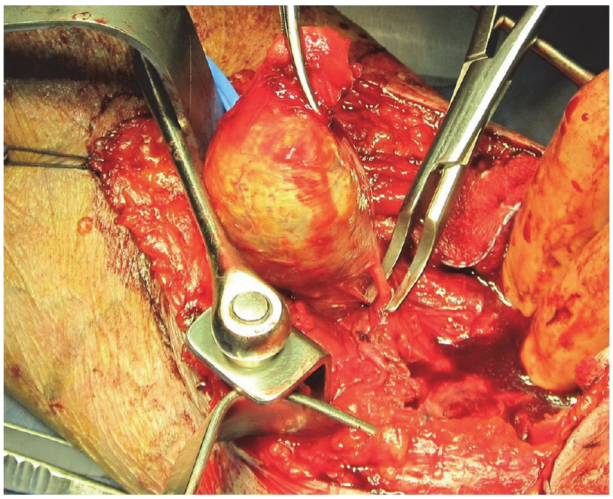

Figure 2 Dissection of the popliteal artery above and below the aneurysm showing the closeness of the two non-diseased popliteal extremities.

During follow-up, we did not see any myointimal hyperplasia, but longer follow-up is needed to confirm the durability of this reconstruction for the popliteal artery.

Popliteal resection and subsequent reimplantation of popliteal extremities could be an alternative for short popliteal artery aneurysms. Longer follow-up is needed to confirm the durability of this technique.

References

1. Mahmood A, Salaman R, Sintler M *et al*. Surgery of popliteal artery aneurysms: a 12-year experience. *J Vasc Surg* 2003; **37**: 586–593.
2. Björck M, Beiles B, Menyhei G *et al*. Contemporary treatment of popliteal artery aneurysm in eight countries: a report from the vascunet collaboration of registries, *Eur J Vasc Endovasc Surg* 2014; **47**: 164–171.
3. Pulli R, Dorigo W, Troisi N *et al*. Surgical management of popliteal artery aneurysms: which factors affect outcomes? *J Vasc Surg* 2006; **43**: 481–487.
4. Garg K, Rockman CB, Kim BJ *et al*. Outcome of endovascular repair of popliteal artery aneurysm using the Viabahn endoprosthesis. *J Vasc Surg* 2012; **55**: 1647–1653.
5. Zenunaj G, Traina L, Acciarri P, Mascoli F. Endovascular versus open repair for popliteal artery aneurysm: a single center experience. *Ital J Vasc Endovasc Surg* 2016; **23**: 10–16.
6. Tielliu IF, Zeebregts CJ, Vourliotakis G *et al*. Stent fractures in the Hemobahn/Viabahn stent graft after endovascular popliteal aneurysm repair. *J Vasc Surg* 2010; **51**: 1413–1418.
7. Shahin Y, Barakat H, Shrivastava V. Endovascular versus open repair of asymptomatic popliteal artery aneurysms: a systematic review and meta-analysis. *J Vasc Interv Radiol* 2016; **27**: 715–722.