International Journal of Surgery Case Reports 4 (2013) 243–245

International Journal of Surgery Case Reports

journal homepage: www.elsevier.com/locate/ijscr

Anterior tibial artery aneurysm: Case report and literature review

Tim A. Sigterman*, Dennis E.J.G.J. Dolmans, Rob J.Th.J. Welten, Attila Krasznai, Lee H. Bouwman

Surgery Department, Atrium Medical Centre, Henri Dunantstraat 5, 6419 PC Heerlen, Netherlands

ARTICLE INFO

Article history:
Received 17 September 2012
Received in revised form
27 September 2012
Accepted 28 September 2012
Available online 23 November 2012

Keywords:
Arteria tibialis anterior
True aneurysm
Aneurysm

ABSTRACT

INTRODUCTION: We present a patient with a true anterior tibial artery aneurysm without any causative history.
PRESENTATION OF CASE: A 59 year old male was referred with a swelling on his left lateral ankle which he noticed 2 months ago, with symptoms of soaring pain. Additional radiological research showed a true arterial tibialis anterior aneurysm. True anterior tibial artery aneurysm is a rare condition. The aneurysm was repaired by resection and interposition of a venous bypass.
DISCUSSION: Patients may complain about symptoms like calf pain, distal ischemia, paresthesias due to nerve compression and the presence of a pulsating or increasing mass. Symptomatic aneurysms require surgical intervention, where bypass with a venous saphenous graft have shown good patency and endovascular treatment have shown good short term results. Asymptomatic and small aneurysm can be followed for several years with DUS.
CONCLUSION: Clinical features, radiographic findings, surgical management, and a review of the literature on true anterior tibial aneurysms are discussed.

1. Introduction

True infrapopliteal aneurysms are extremely rare, while false aneurysms are seen more and usually secondary to trauma. True aneurysms are mostly associated with an infectious or inflammatory process. We will describe a true anterior tibial anterior aneurysm.

2. Case report

A 59-year-old male presented with a swelling on his left lateral ankle which he noticed 2 months previously. It did not seem progressive. The swelling was painful but otherwise asymptomatic. There was no prior history of trauma. He had no signs of systemic vasculitis or any other connective tissue disease. He had a history of hypertension. On examination, he had a pulsatile mass of approximately 4 cm × 5.5 cm on the left lateral ankle (Fig. 1), blood pressure 200/100, normal and symmetric dorsalis pedis (DP) and posterior tibial pulses. Ultrasound showed a ventrolateral anterior tibial artery (ATA) aneurysm with a thrombus mass in the wall. Additional CT-angiography demonstrated no abnormalities in the arterial tree apart from a small (1.4 cm) popliteal artery aneurysm.

Treatment of the aneurysm was performed by excision. An axial incision over the aneurysm was made and nerves (medial-lateral deep fibular peroneal nerve) were identified (Fig. 2). We dissected and slung the ATA (supplying artery) and the DP (draining artery) (Fig. 3). After this the aneurysm was dissected. Reconstruction was performed with autologous saphenous vein. There were good pulses distal to the anastomosis and also good Doppler signals. Thrombus material was cultured but no growth was found. The patient was anticoagulated, starting with daily heparin 12,500 IU while warfarin levels rose to an INR >2.5, while we used a venous bypass. Eight month follow-up was uneventful.

3. Discussion

A literature review for true anterior tibial artery aneurysms was performed, searching the database of pubmed, medline and cochrane. The articles found with true arteria tibialis anterior aneurysm are shown in Table 1. True infrapopliteal aneurysms are extremely rare, only a handful of case-reports have been described. Aetiological factors are trauma,[1–3] collagen vascular pathology, fibromuscular disease, infection,[5] neurofibromatosis[10] and Behcet's syndrome.[11] False peripheral artery aneurysms have an incidence of less than 1%, most are located in the poplitea artery.[12] These aneurysms are caused by trauma or iatrogenic injury after surgical procedures, either orthopaedic or vascular leading to formation of a pseudo aneurysm.[12]

Mycotic aneurysms incidence (1–3.7%) has dropped since the widespread use of antibiotics and treatment of infected heart valves.[13] Before this, mycotic aneurysms were a common complication of endocarditis, first described by Osler in 1885.[13,14] Nowadays trauma is the most frequent aetiology of mycotic aneurysms.[17] These aneurysms are found mostly in the aorta,

* Corresponding author. Tel.: +31 45 5766450; fax: +31 45 5767255.
E-mail addresses: timsigterman@gmail.com (T.A. Sigterman), dejgjdolmans@hotmail.com (D.E.J.G.J. Dolmans), r.welten@atriummc.nl (R.J.Th.J. Welten), a.krasznai@atriummc.nl (A. Krasznai), leebouwman@hotmail.com (L.H. Bouwman).

2210-2612
http://dx.doi.org/10.1016/j.ijscr.2012.09.015

Table 1
True anterior tibial artery aneurysm.

Writer	No.	Age	M/F	Operation	Aetiology
Fallon[1]	1	?	M	Ligation	Traumatic after mortar-fire
Ceconomos [2]	1	56	F	Ligation	Secondary to ostheosynthesis material after #
Crelling and Tsapogas[3]	1	71	F	Ligation	Traumatic injury of ATA after Cruris fracture
Carey and Stremple[4]	1	79	M	Ligation	
Payne-James[5]	1	32	F	Ligation	Infection associated with endocarditis
Borozan et al.[6]	1	60	M	Ligation	
Kars et al.[7]	1	60	M	Ligation	Peroneal nerve compression
Salcuni et al.[8]	1	?	?	Resection	
Rooney and Rooney Jr.[9]	1	45	F	Resection	Ankle inversion injury
Young et al.[10]	1	33	F	Ligation/resection	Neurofibromatosis
Kalko et al.[11]	2	?	?	Primary repair	Behçet disease
Total	12				

Fig. 1. CT-scan showing anterior tibial artery aneurysm.

superior mesenteric, intracranial and femoral arteries, while only six case reports have been published of those affecting the infrapopliteal arteries.[14] Next to this the bacteriology has changed since 1965, when *Salmonella* was most frequent, now *Staphylococcus aereus* incidence has risen affecting one-third.[15]

Symptoms that have been described in true infrapopliteal aneurysms are distal ischaemia,[4,6] calf pain,[5] paresthesias due to nerve compression[7] and the presence of a pulsating or increasing mass.[2,4,6] It is also good possible that it will be an unexpected finding on arteriography, especially when a patient does not experience any symptoms.[4]

Diagnostic tools for confirming the diagnosis are ultrasound, duplex ultrasonography (DUS), CT-scan, magnetic resonance imaging. Our patient was first diagnosed with an ultrasound, followed by duplex arteriography and CT-angiography.

The decision whether treatment is necessary depends on size and possible symptoms of the aneurysm. Small and asymptomatic aneurysms can be managed with follow-up with DUS.[5] Large and symptomatic aneurysm of the anterior tibial artery surgical treatment is essential. Jogler et al.[16] describes four case reports of anterior tibial artery pseudoaneurysms and the first posterior tibial artery aneurysm treated endovascular. Although no stents are designed for infrapopliteal localization, they used stents approved for coronary intervention. Follow-up differs from six weeks,[17] eight months[16] until one year,[18] all with good patency. Other treatment options described are external ultrasound-guided compression, ultrasound guided thrombin injection and angiographic emboliztion.[16] In preparation for the surgery additional research (DUS, MRI, CT) must have been undertaken to plan the procedure, whereby collateral flow through the A. tibialis posterior and A. dorsalis pedis needs to be sufficient.[19] Ligation and resection are types of surgery performed in ATA aneurysms,[1–10] but other possibilities like a venous saphenous graft are performed in tibialis posterior aneurysms with good results.[19] Venous grafting is

Fig. 2. Clinical presentation.

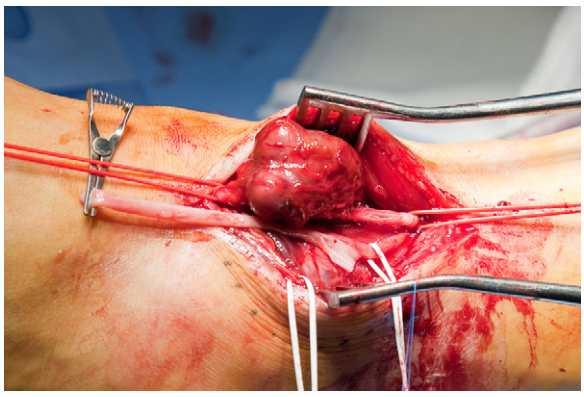

Fig. 3. Preoperative, showing anterior tibial artery aneurysm.

essential when other vessels are occluded and perfusion of the foot depends greatly upon the ATA. According to Faccenna et al.[18] using a autologous conduit is the first choice treatment, as it gives the best long-term patency rate. Keeping mind that recent case reports have shown good one-year patency in endovascular treatment in pseudoaneurysms of the tibialis artery.[16,18] Differential diagnoses for swellings on the lateral ankle include cyst, neuroma, soft tissue tumour, Schwannoma or sarcoma.[6] Complications described are distal ischaemia, midfoot amputation, aneurysm thrombosis, distal embolism, compartment syndrome, nerve compression and rarely rupture causing fatal haemorrhage.[3,5,7,14]

There is no evidence which states in which period these scan should be performed, we performed follow-up the first year at six months with DUS. Follow up can be done with DUS, CT or MRA, our advice should be that at least annual DUS should be performed to determine if the aneurysm is developing symptoms, growing or the bypass is occluded. In a case of a posterior tibial artery aneurysm, no change has been observed in repeated arteriography in a 7-year follow-up.[20]

4. Conclusion

True anterior tibial artery aneurysms are rare. Symptomatic aneurysms require surgical intervention, where bypass with a venous saphenous graft have shown good patency and endovascular treatment have shown good short-term results. Asymptomatic and small aneurysm can be followed for several years with DUS.

Conflict of interest statement

None.

Funding

None.

Consent

Obtained.

Author contributions

T.A. Sigterman and D.E.J.G.J. Dolmans contributed to writing and data collection, R.J.Th.J. Welten, A. Krasznai, L.H. Bouwman contributed to writing and critical revision.

Acknowledgement

We like to thank the patient described above to give his permission to publish this article.

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