

Tibioperoneal true aneurysm: case report and literature review

F. FACCENNA, A. ALUNNO, M.M.G. FELLI, A. CASTIGLIONE, P. IZZO, B. GOSSETTI,
F. STAGNITTI, A. LAURITO, L. IZZO, R. GATTUSO

SUMMARY: Tibioperoneal true aneurysm: case report and literature review.

F. FACCENNA, A. ALUNNO, M.M.G. FELLI, A. CASTIGLIONE, P. IZZO, B. GOSSETTI, F. STAGNITTI, A. LAURITO, L. IZZO, R. GATTUSO

Background. *The true aneurysms of the infrapopliteal arteries are an unusual pathology with low incidence in the general population. They appear in the literature only as isolated case reports. True aneurysms of the infrapopliteal arteries represent a surgical problem, especially when a bifurcation is involved and when the distal vessels are affected by occlusive disease.*

Case report. *A 67 year old man with an aneurysm which involved the tibioperoneal trunk and the origin of peroneal and posterior tibial arteries was surgically treated. At three months follow up, a duplex ultrasonography (DUS) control showed the bypass patency and the total exclusion of the aneurysmal sac.*

Discussion. *Although the aneurysms of the infrapopliteal arteries are very uncommon and often asymptomatic, their associated vascular lesions and/or ischemic complications can lead to high risk of limb loss. When the aneurysm is large and/or symptomatic, the surgical treatment becomes mandatory. A conservative treatment and DUS follow up could be reserved to elderly patients and when the aneurysm is small and asymptomatic.*

RIASSUNTO: Aneurisma vero dell'arteria tibio-peroniera: caso clinico e revisione della letteratura.

F. FACCENNA, A. ALUNNO, M.M.G. FELLI, A. CASTIGLIONE, P. IZZO, B. GOSSETTI, F. STAGNITTI, A. LAURITO, L. IZZO, R. GATTUSO

L'arteria tibiale è raramente colpita da aneurisma vero; la maggior parte dei casi riportati in letteratura sono aneurismi falsi, dal momento che un evento traumatico si trova spesso nell'anamnesi del paziente. L'aneurisma vero infra-popliteo rappresenta un problema chirurgico soprattutto quando è coinvolta la biforcazione e quando i vasi distali sono affetti da malattia occlusiva periferica. Più frequentemente la causa è una degenerazione aterosclerotica della parete arteriosa, ma a volte l'eziologia è micotica.

Gli Autori riportano un caso di aneurisma tibio-popliteo vero, in una donna di 67 anni, trattato chirurgicamente. Il follow-up a 3 mesi ha dimostrato la validità dell'intervento chirurgico.

KEY WORDS: Aneurysm - Tibial artery - Surgery.
Aneurisma - Arteria tibiale - Chirurgia.

Introduction

Tibial arteries are rarely involved by true aneurysms; most of cases reported in the literature are false aneurysms, since a traumatic event is often found in the patient's history. The true infrapopliteal aneurysms represent a surgical problem, especially when a bifurcation is involved

and when the distal vessels are affected by occlusive disease. More frequently the cause is an atherosclerotic degeneration of arterial wall, but sometimes mycotic etiology is reported in literature (1-3).

In our case, a true aneurysm involving the origin of the posterior tibial and peroneal arteries was found and a surgical repair was carried out successfully.

Case report

A 67 year old man was admitted to our Department for a pulsatile painful mass in the antero-lateral compartment of the right leg and for an omolateral blue toe syndrome. The onset of symptoms was

only few days before admission, during his working activity. There was no history of trauma, claudication and/or foot ischemia. No risk factors for atherosclerotic disease were detected: he had never been a smoker and his serum cholesterol level and blood pressure values were in normal range. His past medical history was also not contributory.

On physical examination, a painful pulsatile mass was found on the antero-lateral compartment of the leg just below the knee. All peripheral pulses were present at the ankle. After a duplex ultrasonography (DUS) of the popliteal and tibial vessels, an angiography was carried out and a 5 cm diameter saccular aneurysm was confirmed. It involved the tibioperoneal trunk and the origin of peroneal and posterior tibial arteries (Fig.1).

The patient was operated upon through a medial approach: the popliteal artery, the anterior tibial artery and the tibio-peroneal trunk were exposed to allow a good control of vessels inflow. A very careful dissection was carried out beyond the aneurysm to expose the outflow vessels. A short segment of autologous saphenous vein graft was used. The aneurysm was not removed but sewn with polypropylene 5/0 thread. The venous graft was connected above to the tibioperoneal trunk by an end-to-end anastomosis, and below to the posterior tibial artery by an end-to-side anastomosis; 6/0 and 7/0 polypropylene sutures were used, respectively (Fig.2). Peroneal artery was ligated at the origin. At the end of procedure the posterior tibial artery showed a good pulsatility and an intraoperative angiography showed the patency of the graft (Fig.3).

The patient was discharged after 8 days with relief of symptoms and posterior tibial pulse presence. Three months postoperatively, a DUS control showed the bypass patency and the total exclusion of the aneurysmal sac.

Discussion

The true aneurysms of the infrapopliteal arteries are an unusual pathology with low incidence in general population. They appear in the literature as isolated case reports (Tab.1). When those aneurysms become symptomatic, the patients can be observed on emergency for acute or critical leg or foot ischemia due to distal embolization or thrombosis of the aneurysm itself (4,5). In 2 cases microembolization with subsequent blue toe syndrome was reported (6,7). Sometimes the patients complain for chronic symptoms like claudication, rest pain or painful pulsatile mass. In only one case compression of the peroneal nerve was reported (8). Two patients had the rupture of tibial aneurysm: one of them complained for an acute painful calf swelling (9) and the other one had an acute compartment syndrome of both lower legs due to ruptured mycotic aneurysms of tibial arteries (10). Furthermore, it must be emphasized that those aneurysms may be identified accidentally by angiography or computed tomography (CT) scan carried out for occlusive disease (11,12). The diagnosis is not easy since digital or leg ischemia, claudication and pain are not typical or suggestive. Only the finding of a pulsatile mass can lead to suspect an aneurysm (13-15). Nevertheless, the diagnosis can be reached by means of ultrasound, CT scan, magnetic resonance imaging (MRI) or digital subtraction angiography (DSA).

The treatment depends on the clinical presentation.



Fig. 1 - Angiography. Aneurysm involves the tibioperoneal trunk and the origin of peroneal and posterior tibial arteries.

When the aneurysms are small and asymptomatic, they can be followed for a long period by DUS, since the incidence of complications and the progression in size seems to be low. However, complications can occur indeed. When large and/or symptomatic aneurysm is found, the choice treatment is surgery.

There is no evidence in literature about endovascular exclusion by covered stent of infrapopliteal true aneurysms, probably due to the small vessels diameter, although a case of coil embolization is described (16). The procedure should be planned on the basis of angiographic findings (DSA, CT scan or MRI) and, if possible, the tibial arteries should be repaired to allow a better perfusion of the leg, especially when other vessels are occluded



Fig. 2 - Surgical treatment.



Fig. 3 - The intraoperative angiography showing the patency of the graft.

by microembolization or atherosclerotic lesions. In such conditions, the use of autogenous saphenous vein graft as a bypass (2,6,13,17-20) or as a patch (7,21) is the first choice, since it allows the best long-term patency rate. When the autologous vein is not available, a thin wall polytetrafluoroethylene (PTFE) graft could be used, but its employment is described principally in popliteal aneurysm repair; in three cases a PTFE popliteal-tibial artery bypass was carried out (22,23) In one patient an end-to-end anastomosis was performed after aneurysm excision (24). If the tibial arteries are in good conditions, the simple ligation of the aneurysm can be sufficient and safe and it can be left in place (8,10,14) or resected (4,15,25-30).

Conclusion

Although the aneurysms of the infrapopliteal arteries are very uncommon and often asymptomatic, their associated vascular lesions and/or ischemic complications can lead to high risk of limb loss; therefore we believe that, when the aneurysm is large and/or symptomatic, the surgical treatment becomes mandatory.

The reconstruction of the arteries should be preferred especially when those ones are involved by occlusive disease.

A conservative treatment and a follow up by of DUS could be reserved to elderly patients and when the aneurysm is small and asymptomatic.

TABELLA 1 - THE TRUE ANEURYSMS APPEAR IN THE LITERATURE AS ISOLATED CASE REPORTS.

Author, year	Age	Localization	Cases, n	Bilateral	Etiology	Symptoms	Treatment	Follow-up
Pappas, 1964	Unknown	PTA	1	No	Unknown	None	Unknown	Unknown
Carey, 1967	70	ATA	1	No	Unknown	Acute ischemia foot	Ligation	Transmetatarsal amputation
Jenyo, 1987	60	PTA	1	No	Unknown	Painless swelling	Ligation + excision	Good at discharge
Yao, 1987	46	PTA	1	No	Unknown	Claudication	None	Good at discharge
Payne-James, 1988	32	ATA	1	No	Mycotic	Painful swelling	Ligation	2 months good results
Borozan, 1989	61	ATA	1	No	Atherosclerotic	Painful swelling	Ligation	Good at discharge
Salcuni, 1991	54	ATA	1	No	Atherosclerotic	Painless swelling	Resection + venous bypass	Good at discharge
Wu, 1991	52	DPA	1	No	Unknown	Painless swelling	Ligation + excision	Unknown
Mayall, 1991	45	ATA	1	No	Mycotic	Painless swelling	Ligation + excision	14 years patency
Kars, 1992	60	ATA	1	No	Unknown	Foot drop and hyperesthesia for peroneal nerve compression	Ligation	6 months later symptoms regression
Katz, 1992	37	PTA bilateral	5	Yes	Nonspecific arteritis	Painful swelling	Resection + venous bypass	Unknown
Akers, 1992	49	ATA						
Hasaniya, 1993	32	TPT bilateral	1	No	Mycotic	Painless swelling	Resection + venous bypass	9 months patency
Iwamoto, 1994	37	TPT	2	Yes	Polyarteritis nodosa	Acute compartment syndrome both lower limbs	Ligation	Death 19 th post-operative day
Nahrsredt, 1995	63	PTA + ATA	1	No	Unknown	Acute painful swelling (ruptured aneurysm)	Resection + venous bypass	Good at discharge
Mormoreale, 1995	65	TPT	1	No	Atherosclerotic	Peripherec microembolism	Venous bypass	Unknown
Menanteau, 1995	78	TPT + ATA	2	No	Atherosclerotic	Painless swelling + claudication	Resection + PTFE bypass	64 months patency
Monig, 1996	39	TPT	1	No	Mycotic (post <i>Streptococcus bovis</i> endocarditis)	Painful swelling	Ligation + excision	3 months good results
McKee, 1999	15	TPT	3	Yes	Atherosclerotic mycotic (post <i>Brucella canis</i> endocarditis)	Painless swelling	Resection + venous patch	32 months patency
Cappendijk, 1999	60	TPT	1	No	Unknown	Painful swelling	1 Venous bypass (2 of 3 were thrombosed)	15 months patency
McKee, 2000	71	DPA	1	No	Associated with epithelioid hemangioma	Painless swelling	Resection + venous bypass	15 months patency
Manouguian, 2000	64	TPT	1	No	Atherosclerotic	Critical ischemia right foot	Ligation + excision	Unknown
Young, 2001	33	ATA	1	No	Associated with neurofibromatosis	Painful swelling	Ligation + excision	Thigh amputation
Sakai, 2002	54	PTA	1	No	Atherosclerotic	Painful swelling	Ligation + excision	1 year palpable pulses
Spronk, 2003	52	TPT	1	No	Atherosclerotic	Painless swelling	Resection + venous patch	4 months good results
Kato, 2004	61	DPA	1	No	Atherosclerotic	Painful swelling	Ligation + excision	12 months patency
Kanaoka, 2004	69	PTA	1	No	Atherosclerotic	Painful swelling	Venous bypass	5 months good results
Larena-Avellaneda, 2004	53	TPT (associated to contralateral popliteal aneurysm)	1	No	Mycotic (<i>Candida albicans</i>)	Painless swelling	Embolization with coils	Good at discharge
Kalko, 2005	Uk	ATA	2	No	Associated with Behçet disease	Unknown	PTFE bypass	3 years good results
Dantes, 2006	60	PTA	1	No	Mycotic (<i>S. pallidum</i>)	Painless swelling	Venous bypass	Good at discharge
Tshomba, 2006	54	PTA	1	No	Atherosclerotic	Painless swelling	Resection + end-to-end anastomosis	18 months patency
Kreidy, 2006	66	TPT	1	No	Mycotic (<i>Enterococcus faecalis</i>)	Unknown	Ligation + excision	38 months patency
Leon, 2007	59	ATA	1	No	Mycotic (<i>Staphylococcus</i>)	Painless swelling	Venous bypass	Good at discharge

References

1. Mayall JC, Mayall RC, Mayall ACDG, Mayall LCDG. Peripheal aneurysm. *Int Ang* 1991;10(3):141-5.
2. Danes SG, Drezner D, Tamminp. *Vasc Endovasc Surg* 2006; 40:328-30.
3. McKee MA, Ballard JL. Mycotic aneurysms of the tibio-peroneal arteries. *Ann Vasc Surg* 1999; 13: 188-190.
4. Carey LC, Stremple JF. An aneurysm of the anterior tibial artery. *Angiology* 1967; 18: 117-21.
5. Manouguian S, Mlynec-Kersjes ML. Spontaneous complete rupture of a thrombotic aneurysm of the tibiofibular trunk. *Pathologie* 2000; 21: 303-7.
6. Nahrstedt U, Ruckert K. Isolated, true aneurysm of the tibiofibular trunk – a rarity among peripheral aneurysms. *Vasa* 1995;24(4): 373-6.
7. Spronk S, den Hoed PT, Veen HF. Case report: blue toe syndrome caused by a true crural aneurysm. *J Vasc Nurs* 2003;21:70-1.
8. Kars HZ, Topaktas S, Dogan K. Aneurysmal peroneal nerve compression. *Neurosurgery* 1992;30:930-1.
9. Iwamoto K, Igawa S, Maekawa Y and Kinoshita H. Case of possible true aneurysm of the posterior tibial artery. *Osaka City Med J* 1994; 40: 31-5.
10. Hasaniya N, Katzen JT. Acute compartment syndrome of both lower legs caused by ruptured tibial artery aneurysm in a patient with polyarteritis nodosa: a case report and review of literature. *J Vasc Surg* 1993;18(2):295-8.
11. Pappas G, Janes JM, Bernatz PE, Schirger A. Femoral aneurysms. *JAMA* 1964; 190: 489-93.
12. Yao JST, McCarthy WJ. Multiple arterial aneurysms: a seven years follow-up. *Contemp Surg* 1987; 31: 73-8.
13. Salcuni P, Azzarone M, Ugolotti U, Mandrioli R and Tecchio T. An unusual case of a double location of atherosclerotic aneurysms of the ulnar artery and anterior tibial artery. *Angiologia* 1991;43(1):1-6.
14. Borozan GP, Walker HSJ, Peterson GJ. True tibial artery aneurysm: case report and literature review. *J Vasc Surg* 1989; 10: 457-9.
15. Jenyo MS. Silent posterior tibial artery aneurysm. *J Cardiovasc Surg* 1987; 28: 456-9.
16. Larena-Avellaneda A, Debus ES, Daum H, Kindel M, Gross-Fengels W, Imig H. Mycotic aneurysms affecting both lower legs of a patient with Candida endocarditis-endovascular therapy and open vascular surgery. *Ann Vasc Surg* 2004; 18: 130-33.
17. Akers DL Jr, Fowl RJ, Kempczazinski RF. Mycotic aneurysm of the tibioperoneal trunk: case report and review of literature. *J Vasc Surg* 1992;16: 71-4.
18. Cappendijk VC, Mouthaan PJ. A true aneurysm of the tibio-peroneal trunk. Case report and literature review. *Eur J Vasc Endovasc Surg* 1999; 18: 536-7.
19. Kanaoka T, Matsuura H. A true aneurysm of the posterior tibial artery: a case report. *Ann Thorac Cardiovasc Surg* 2004; 10(5): 317-8.
20. Leon LR Jr, Psalms SB, Stevenson S, Mills JL Sr. Non traumatic aneurysms affecting crural arteries: case report and review of the literature. *Vascular* 2007; 15: 102-8.
21. Monig SP, Walter M, Sorgatz S and Erasm H. True infrapopliteal artery aneurysms: report of two cases and literature review. *J Vasc Surg* 1996; 24: 276-8.
22. Marmorale A, Sapienza P, Gallo P, Bernucci P, Cavallaro A. Aneurysms of the infrapopliteal arteries. *J R Coll Surg Edinb* 1995; 40: 324-9.
23. Kalko Y, Basaran M, Aydin U, Kafa U, Basaranoglu G, Yasar T. The surgical treatment of arterial aneurysms in Behcet disease: a report of 16 patients. *J Vasc Surg* 2005; 42: 673-7.
24. Tshomba Y, Papa M, Marone EM, Kahlberg A, Rizzo N, Chiesa R. A true posterior tibial artery aneurysm. A case report. *Vasc Endovasc Surg* 2006; 40: 243-9.
25. Wu KK. True aneurysm of the dorsalis pedis artery mimicking a soft tissue tumor. *J Foot Surg* 1991; 30: 304-7.
26. Young LP, Stanley A, Menzoian JO. An anterior tibial artery aneurysm in a patient with neurofibromatosis. *J Vasc Surg* 2001; 33: 1114-7.
27. Sakai H, Miki T, Tamai K, Yamato M, Saotome K. Nontraumatic aneurysm of a branch of the posterior tibial artery mimicking a schwannoma. *Mag Res med Sci* 2002; 1: 233-6.
28. McKee TI, Fisher JB. Dorsalis pedis artery aneurysm: case report and literature review. *J Vasc Surg* 2000; 31: 589-91.
29. Kato T, Takagi H, Sekino S, Manabi H, Matsuno Y, Furuhashi K, et al. Dorsalis pedis artery true aneurysm due to atherosclerosis: case report and literature review. *J Vasc Surg* 2004; 40: 1044-8.
30. Izquierdo GF, Vogel SG. Limb aneurysms. *J Cardiovasc Surg* 1973: 278-84.

→ ACCESSO

Utente

Password



- Profilo utente
- Registrazione

→ RIVISTA

- Presentazione
- Media Planner
- Ultimo numero
- Archivio numeri precedenti
- Ricerca
- Abbonamento
- Forthcoming Events



Gentile Lettore,

Il Giornale di Chirurgia - Journal of Surgery

è consultabile anche on-line

Al sito si accede direttamente all'indirizzo

www.giornalechirurgia.it

oppure attraverso il sito della nostra casa editrice

www.gruppocic.it

nella sezione "Giornali, Riviste, Newsletter"

La ricerca bibliografica si effettua tramite:

titolo, autore, anno di pubblicazione, abstract e tipologia di articolo (case report, clinical case, ecc.).

Ci teniamo inoltre a sottolineare di aver raggiunto un importante ed ambizioso traguardo. Infatti, il full text di ogni abstract pubblicato da Medline è direttamente evidenziato e disponibile sulla stessa pagina attraverso una apposita icona.

Può apparire un successo di poca rilevanza se non fosse che tale iniziativa si è resa possibile grazie alla nostra partecipazione al programma LinkOut, le cui caratteristiche sono evidenziate nella home page di Medline.

In breve, il contenuto di ogni numero de Il Giornale di Chirurgia - Journal of Surgery non viene più inviato in forma cartacea ma tramite Internet attraverso l'attivazione di un canale diretto di comunicazione con Medline (utilizzando un indirizzo FTP).

Ciò consente - tra i vari vantaggi - la pubblicazione degli abstract su Medline contestualmente alla uscita del prodotto cartaceo.

Come prima e per ora unica casa editrice scientifica italiana, siamo molto orgogliosi di quanto sopra e dei benefici che tutti gli Autori ed i lettori potranno trarne.

L'Editore