

## CASE REPORT

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# True aneurysm of medial plantar artery: case report

## *Aneurisma verdadeiro de artéria plantar medial: relato de caso*

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### Abstract

Peripheral aneurysms deserve attention because of their low frequency and potential association with other aneurysms, especially of the abdominal aorta. The true aneurysm of the plantar artery is even less frequent. The literature available is scarce and focuses on cases of post-traumatic arterial pseudoaneurysms. In this paper, we report the case of an 85-year-old female patient with a one-year history of pain on the right foot when walking associated with a pulsatile tumor in the plantar region at the base of the big toe. The patient had no history of trauma or foot surgery. Vascular ultrasonography and MR angiography showed a plantar artery aneurysm. Aneurysmectomy with ligation of the medial plantar artery was performed. The patient had a good postoperative course.

**Keywords:** peripheral arterial aneurysm; true arterial aneurysm of lower limbs; aneurysm of the plantar medial artery.

### Resumo

Os aneurismas periféricos merecem atenção pela sua baixa frequência e associação com outros aneurismas arteriais, principalmente o de aorta abdominal. O aneurisma de artéria plantar verdadeiro é ainda mais raro. A escassa literatura disponível concentra-se nos casos de pseudoaneurisma pós-traumático dessa artéria. Relata-se o caso de uma paciente do sexo feminino, 85 anos, com queixa de dor no pé direito ao deambular durante um ano, acompanhada de nódulo pulsátil em região plantar, próximo da base do primeiro pododáctilo. Não havia história prévia de trauma ou cirurgia na região plantar acometida. Realizou-se ecografia vascular e angiorressonância, que diagnosticaram aneurisma de artéria plantar. A paciente foi então submetida à aneurismectomia com ligadura das artérias nutricionais, apresentando boa evolução pós-operatória.

**Palavras-chave:** aneurisma arterial periférico; aneurisma arterial verdadeiro dos membros inferiores; aneurisma da artéria plantar medial.

### Introduction

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True aneurysms of peripheral arteries should be given attention in view of their low frequency and association with other aneurysms, especially of the abdominal aorta<sup>1</sup>. They are more commonly located in the lower extremities and extracranial carotid arteries<sup>1</sup>.

Although lower limb aneurysms are less common than those of the abdominal aorta, reports on their diagnosis and treatment are found earlier and in larger

number in the literature compared to reports on abdominal aortic aneurysms (AAA)<sup>1-3</sup>. This is most likely explained by the fact that, at the time of those reports, peripheral aneurysms were more easily diagnosed and surgically approached than AAA<sup>1-3</sup>.

When it comes to the lower limbs, the popliteal artery is the most common site for aneurysms. Popliteal aneurysms, especially bilateral ones, are frequently associated with AAA. The femoral artery is the second most common site for true peripheral artery aneurysms, while

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the distal (infra-popliteal) arteries are rarely affected<sup>4-12</sup>. True aneurysm of the plantar artery is very rare. The few cases reported seem to be related to local trauma — iatrogenic or not — and are actually reports of post-traumatic plantar artery pseudoaneurysms<sup>13</sup>. On the other hand, a true peripheral artery aneurysm is usually degenerative and related to atherosclerosis. Its diagnosis is made by clinical examination, when a pulsatile tumor is detected along the path of an artery<sup>1,2,12,13</sup>. The diagnosis is usually confirmed by imaging methods such as Doppler vascular echography, CT and MR angiography and arteriography<sup>12</sup>. Thrombosis and embolism are the most common complications of peripheral aneurysms, unlike abdominal aortic aneurysms, whose leading complication is rupture<sup>1,2,7-9,12,14</sup>.

### Case report

We report the case of an 85-year-old female retired teacher, born and resident in Campo Grande (MS). She consulted at the Outpatient Clinic of the Vascular Surgery Service of the *Hospital Santa Casa de Campo Grande* in March 2008 with a one-year history of pain on the right foot at walking that was relieved with rest. A 2-cm pulsatile tumor was observed on the right plantar region, at the base of the big toe. The patient had sought orthopedic assistance previously, and the hypotheses of plantar arthropathy, plantar fasciitis or soft tissue tumor were considered. Ultrasonography had shown an aneurysm, so the patient was referred to the Vascular Surgery Service. She denied previous trauma, puncture or surgery on the plantar region. Her past medical history was significant for arterial hypertension and dyslipidemia,

and she reported being a former smoker. Nephrologic assessment showed a 40% reduction in renal function. At physical examination, she also had normal and symmetric posterior tibial and dorsalis pedis pulses. There were no signs of microembolization, such as cyanosis and gangrene. Temperature of the affected foot was normal and there were no local inflammatory signs. Clinical examination and vascular ultrasonography did not show aneurysms in other arterial segments. Markers for inflammatory processes such as sedimentation rate and C-reactive protein were normal.

Magnetic resonance (MR) angiography (Figures 1 and 2) and Doppler ultrasonography of the right foot were performed to confirm the hypothesis of aneurysm shown by the previous ultrasonography. A true aneurysm of the plantar artery was then diagnosed. Arteriography was not performed because of the potential risks to renal function, which was already compromised. After confirmation of the diagnosis, surgical repair was proposed and performed on June 2008.

Under spinal anesthesia, the patient was placed in a supine position. A distal longitudinal incision was made on the medial plantar region, at the base of the big toe. The aneurysm was dissected and the proximal and distal necks were isolated. The medial plantar artery proximal and distal to the aneurysm, as well as four small branches that came out of it, were ligated. The aneurysm sac was opened, and some mural thrombi were found inside it. The aneurysm was then completely resected and sent for anatomopathological examination. The result confirmed the presence of a true aneurysm in the plantar medial artery.

At the end of the operation and throughout the postoperative period, no changes in perfusion of the fore-foot and toes were observed. The patient was discharged on the second postoperative day, and had a good and

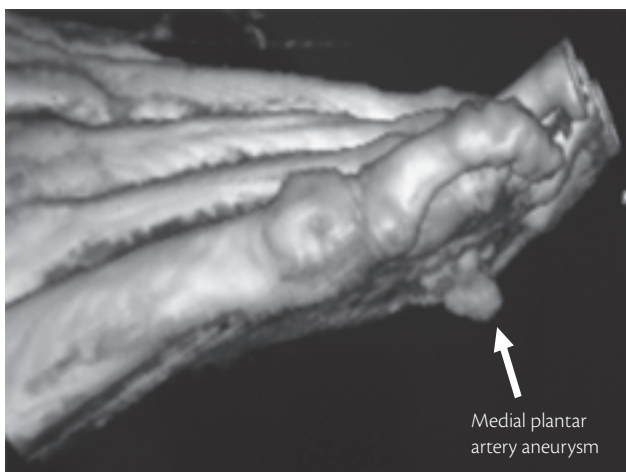


Figure 1. Lateral view of right foot angioresonance.

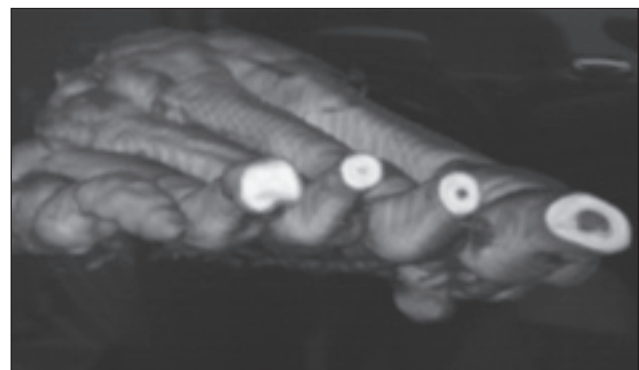


Figure 2. Frontal view of right foot angioresonance.

uneventful recovery, without complaint of pain at outpatient follow-up. She was examined at 30 days, 6 and 12 months after the operation, and the imaging methods did not show aneurysm formation in other sites.

## Discussion

This case report is relevant because it addresses a rare entity. Aneurysms of the lower limbs — especially those of the tibial arteries, dorsal artery of the foot, medial and lateral plantar arteries — are very rare and there are few papers published on the subject.

We have been unable to find, after a search on reference databases, any case reports of medial plantar artery aneurysms. We have found one case report of a lateral plantar artery aneurysm, possibly because it is a superficial artery, which makes the diagnosis easier<sup>13</sup>.

Most papers on aneurysms and pseudoaneurysms of the plantar arteries reported have traumatic etiology, as in cases of osteotomy and other orthopedic procedures on the plantar region, penetrating and contusion trauma, including repeated trauma<sup>13,15</sup>. Some cases may be related to atherosclerotic disease, although this is more common in aneurysms of the dorsalis pedis arteries<sup>13</sup>. The patient had no past history of trauma or infection to justify the aneurysmal formation. She did not have abnormal inflammatory markers either, which decreased the possibility of an inflammatory arteriopathy to be the cause of the aneurysm<sup>1,2,12</sup>.

Histopathologic study confirmed the diagnosis of a true medial plantar artery aneurysm. The scant literature on this subject describes pseudoneurysms as the most common presentation in this site<sup>15-18</sup>. Differential diagnosis includes bone and soft tissue tumors of the plantar region, as well as inflammatory and post-traumatic arthropathies<sup>15</sup>.

Diagnosis by physical examination alone may be difficult, so imaging methods such as soft tissue ultrasonography, computed tomography scan and magnetic resonance imaging are also required<sup>13</sup>. When the hypothesis of plantar artery aneurysm is raised, definitive diagnosis may be obtained with Doppler ultrasonography, MR angiography or arteriography. The diagnosis in this case was confirmed by both Doppler ultrasonography and MR angiography of the foot.

Aneurysmectomy is the gold standard treatment in these cases, in which ligation of the feeding arteries are performed<sup>1,13,15-18</sup>. When severe ischemia is associated due to rupture or microembolization, partial foot

amputation may be indicated, as reported in literature<sup>13</sup>. It is worth emphasizing that aneurysms may form in other arteries, and that such cases should be followed up in the outpatient clinics with physical examination and vascular ultrasonography of the main arteries<sup>1,2,19,20</sup>.

## References

1. Brito CJ, Schulze GC, Loureiro E. Aneurismas dos membros inferiores. In: Brito CJ editor. Cirurgia vascular, cirurgia endovascular e angiologia. 2ª ed. Rio de Janeiro: Revinter; 2008. p. 609-27.
2. Brito CJ. Aneurismas arteriais periféricos. In: Maffei FH. Doenças vasculares periféricas. 3ª ed. Rio de Janeiro: Medsi; 2002. p. 1149-67.
3. Darwin E. Aorta e artérias ilíacas. In: Darwin E. Doenças vasculares: abordagens multidisciplinares ao diagnóstico e tratamento. Rio de Janeiro: Dilivros; 1999. p. 207-487.
4. Graham LM. Femoral and poplitea aneurysms. In: Haimovici H, editor. Vascular surgery. Philadelphia: WB Saunders Co; 2000. p. 1345-56.
5. Vieira GN, Luz NW. Aneurismas das artérias dos membros inferiores. In: Bonamigo TP, Burihan E, Cinelli Jr M, von Ristow A. Doenças da aorta e seus ramos: diagnóstico e tratamento. São Paulo: BYK; 1991. p. 59-72.
6. Miranda F. Aneurisma da artéria poplítea. In: Bonamigo TP, von Ristow A. Aneurismas. Rio de Janeiro: Dilivros; 2000. p. 252-8.
7. Galindo CC, Lima CA, Cardoso JE, Galindo Filho G, Costa VS, Penha FM. Aneurisma aterosclerótico isolado da artéria femoral superficial - relato de caso. J Vasc Br. 2003;2:145-7.
8. Oliveira RS, Ferreira DA, Terra Júnior JA, Lenza RM, Assis Filho AC, Nunes W. Ruptura de aneurisma da artéria poplítea: relato de caso e revisão da literatura dos últimos 50 anos. J Vasc Br. 2005;4:105-10.
9. Kanaoka T, Matsuura H. A true aneurysm of the posterior tibial artery: a case report. Ann Thorac Cardiovasc Surg. 2004;10:317-8.
10. Monig SP, Walter M, Sorgatz S, Erasmi H. True infrapopliteal artery aneurysms: report of two cases. J Vasc Surg. 1996;24:276-8.
11. Lima IA, Lima MF, Bernardes MV. Aneurisma isolado de artéria femoral profunda: relato de caso e revisão da literatura. J Vasc Br. 2003;2:333-8.
12. Marques SRB, Guedes RAA, Lins EM, Lucena BM, Maranhão CAA, Tenório E. Aneurisma verdadeiro bilateral de artéria tibial posterior. J Vasc Bras 2006;5:63-6.
13. Agarwal M, Harkless L, Hagino RT, Toursarkissian B. Lateral plantar artery aneurysm: a case report. J Am Podiatr Med Assoc. 2007;97:480-2.
14. Huber TS, Back MR, Ballinger RJ, et al. Utility of magnetic resonance arteriography for distal lower extremity revascularization. J Vasc Surg. 1997;26:415-23.
15. Praszek AJ, Aminian A, Schneider JR, Milos S. Lateral plantar artery pseudoaneurysm after calcaneal osteotomy: a case report. Foot Ankle Int. 2006;27:vi.

16. Morini F. Pseudoaneurysm of the lateral plantar artery after foot laceration. *J Vasc Surg.* 2003;37:672-5.
17. Gentile AT, Zizzo CJ, Dahukey A, Berman SS. Traumatic pseudoaneurysm of the lateral plantar artery after endoscopic plantar fasciotomy. *Foot Ankle Int.* 1997;18:821-2.
18. Economou P, Paton R, Galasko CS. Traumatic pseudoaneurysm of the lateral plantar artery in a child. *J Pediatr Surg.* 1993;28:626.
19. Diwan A, Sarkar R, Stanley JC, Zelenock GB, Wakefield TW. Incidence of femoral and popliteal artery aneurysms in patients with abdominal aortic aneurysms. *J Vasc Surg.* 2000;31:863-9.
20. Stone PA, Armstrong PA, Bandyk DF, et al. The value of duplex surveillance after open and endovascular popliteal aneurysm repair. *J Vasc Surg.* 2005;41:936-41.

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Final approval of the article\*: FRAS, MLC, MRC, MBJ, FAMA, GRPSR, GMF  
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