

Case Report

Posterior Tibial Artery Aneurysm Caused by Trauma: A Case Report

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In this study, we present a case of 59-year-old man with a posterior tibial artery (PTA) aneurysm. Mostly, PTA aneurysm is caused by trauma, infection, and iatrogenic injury. The patient had a history of ankle trauma that occurred 2 years ago. Computed tomography and ultrasonography showed a 7×14 mm PTA aneurysm. The aneurysm was resected and primary end-to-end anastomosis was performed. So far, there are only few reported cases of PTA aneurysm. Herein, we describe the surgical strategy and provide detailed intraoperative images.

Keywords: posterior tibial artery aneurysm, surgery, trauma

Introduction


Posterior tibial artery (PTA) aneurysm is a very rare occurrence. PTA aneurysm is induced by atherosclerosis, trauma, connective tissue disorder, vasculitis, and infection.¹ A true aneurysm is less common than a pseudoaneurysm,¹ and most PTA aneurysms occur secondary to trauma, infection, or iatrogenic injury.² There are only a few reports of PTA aneurysms, especially reports detailing the surgical strategies with intraoperative photographs. Herein, we describe a case of PTA aneurysm probably caused by trauma that was successfully treated with surgical procedure, accompanied by detailed intraoperative photographs.

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Case Report

A 59-year-old male patient with no major medical history presented with a palpable lump in his right ankle to our hospital. He noticed the lump 3 days prior and there was no pain or redness. Physical examination revealed a 7×14 mm pulsatile mass behind the right medial malleolus. He had a history of trauma to his right ankle about 2 years ago. He hit his right ankle on a rock in a garden when he was running. Physical examination revealed no other abnormal findings, such as fever, rash, purpura, arthritis, and findings suggestive of connective tissue disorder. Ultrasonography revealed a PTA aneurysm with an intramural thrombus (Fig. 1A). Contrast-enhanced computed tomography (CT) showed a PTA aneurysm and no other abnormal findings throughout his whole body (Fig. 1B). Echocardiography showed no evidence of infectious endocarditis. Also, laboratory investigations including erythrocyte sedimentation rate and specific antibodies were within normal ranges.

He underwent elective surgery under local anesthesia (Supplemental video). We marked the locations of the aneurysm and the greater saphenous vein of the right ankle with a black marker (Fig. 2A). A 10 cm incision was created behind the medial malleolus, and the proximal and distal portions of the aneurysm were secured with vessel tape

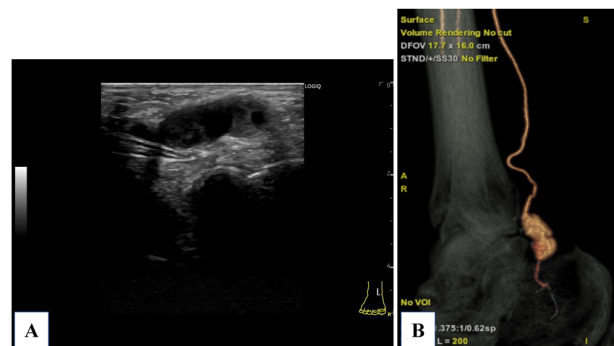


Fig. 1 (A) Ultrasonography shows a PTA aneurysm with an intramural thrombus. (B) Preoperative contrast-enhanced computed tomography shows a PTA aneurysm and a tortuous proximal PTA.
PTA: posterior tibial artery

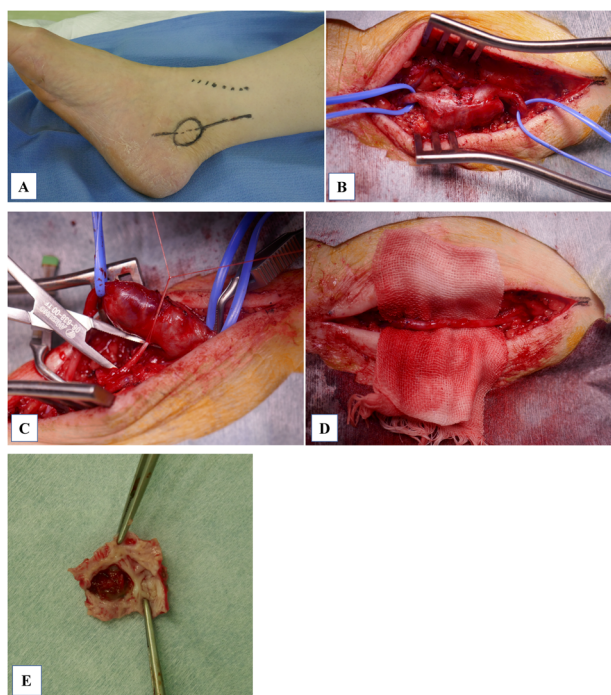


Fig. 2 (A) The saphenous vein is marked with a dotted line. The aneurysm and PTA are marked with a solid line. (B) The PTA proximal and distal to the PTA aneurysm are exposed with vessel tape. (C) Some aneurysm branches are ligated. (D) The aneurysm is resected and primary end-to-end anastomosis is performed with 7-0 polypropylene suture material. (E) The resected aneurysm shows a partially damaged intima, indicating pseudoaneurysm. PTA: posterior tibial artery

(Fig. 2B). A few branches were ligated before the resection of the aneurysm (Fig. 2C). Primary end-to-end anastomosis with 7-0 polypropylene suture material was completed by peeling off connective tissue around the proximal PTA of the aneurysm and by extending the tortuous PTA (Fig. 2D). The resected aneurysm had a partially defected intima, indicating pseudoaneurysm (Fig. 2E). Histology confirmed the presence of degenerated tunica media corresponding to trauma. The bacteriological examination was negative. He did not have any complications and was discharged on postoperative day 2. Follow-up color doppler ultrasonography and contrast-enhanced CT revealed that the PTA was patent at 6 months postoperatively (Fig. 3).

Discussion

PTA aneurysm is very rare. Although there have been a few case reports of PTA aneurysm, the operative details and clear intraoperative photography are rarely published. Pseudoaneurysms occur more often than true aneurysms.¹⁾ PTA aneurysm rupture is extremely rare.³⁾ Furthermore, to the best of our knowledge, PTA aneurysm rupture caused by atherosclerosis and trauma has not been reported ear-



Fig. 3 Follow-up contrast-enhanced computed tomography reveals a patent and straight posterior tibial artery at 6 months postoperatively.

lier. The rupture of a true 60 mm diameter PTA aneurysm after infectious endocarditis has been reported in the past study.³⁾ In this previous case, the etiology was considered to be infective, despite the histological examination not showing any bacteria.³⁾ A few cases of ruptured tibial artery have been reported in patients with connective tissue disorders and vasculitis.^{4,5)} There is no guideline for the treatment of PTA aneurysm. However, the typical indications for invasive treatment are a symptomatic aneurysm, an asymptomatic large aneurysm, and an aneurysm with a laminated thrombus.²⁾ For asymptomatic small aneurysms, a conservative approach may be acceptable. A review of the literature revealed a case in which an asymptomatic aneurysm showed no enlargement or development of symptoms for 7 years.⁶⁾

There are various treatment options for PTA aneurysm. The surgical approaches are excision of the aneurysm with interposition by a saphenous vein graft or end-to-end anastomosis, ligation, and endovascular therapy.¹⁾ Surgical or endovascular therapy should be selected depending on the location, shape, and size of the aneurysm, as well as the patient's general condition.¹⁾ Ligation may be required, especially in an emergency setting, but surgical excision with PTA reconstruction either by end-to-end anastomosis or by interposition with a vein graft is the preferred treatment in non-emergency cases.⁶⁾ Interposition of a vein graft is common, whereas end-to-end anastomosis is thought to be suitable for local lesions.^{2,6)}

In our case, the patient wanted surgery to avoid the future risk of embolization, thrombosis, and rupture leading to ischemia and amputation. We decided to conduct surgery, even though his aneurysm was asymptomatic.

The proximal portion of the PTA aneurysm was meandering; therefore, we performed end-to-end anastomosis by straightening the tortuous proximal PTA (**Supplemental video**). To reduce the surgical stress and the possibility of infection, end-to-end anastomosis should be the first choice, especially in asymptomatic cases. It is important to spare the tibial nerve accompanying the PTA; however, there are no other important anatomical structures and the resection of the PTA posterior to the medial malleolus is not complicated. The etiology of the PTA aneurysm in our patient was probably trauma, given his history of trauma 2 years ago, operative findings, and histological findings.

Conclusion

We successfully treated a PTA aneurysm surgically and provided more detailed intraoperative images than previous case reports. The indication for invasive treatment and surgical approach should be carefully decided based on the location, shape, symptom, and size of the aneurysm, as well as the patient's overall condition and will.

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Disclosure Statement

All authors have no conflict of interest.

Statement of Patient Consent

Obtained.

Author Contributions

Study conception: YM, FM

Data collection: YM

Writing: YM

Surgery: FM

Critical review and revision: all authors

Final approval of the article: all authors

Accountability for all aspects of the work: all authors

Supplementary Information

Supplementary movie is available at the online article sites on J-STAGE and PMC.

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