

Open surgical ligation of a symptomatic mycotic aneurysm of the peroneal artery

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ABSTRACT

A mycotic peroneal artery aneurysm (MPAA) is a rare diagnosis. We describe a case of a patient with active fungal endocarditis who developed right lower extremity pain. Imaging demonstrated that this patient had an MPAA. This was treated with open ligation of the peroneal artery, and decompression of the aneurysm sac was performed for symptom relief. Although a rare diagnosis, MPAA should be considered in patients with a history of endocarditis who present with leg pain. (J Vasc Surg Cases and Innovative Techniques 2019;5:68-70.)

Keywords: Infected aneurysm; Pseudoaneurysm; Infrainguinal; Endocarditis

Infective endocarditis is caused by a bacterial or fungal infection that damages the endocardium and heart valves. The origin of this infection has many sources, but it is a known complication of intravenous (IV) drug abuse. An accumulation of bacteria and cells, or vegetations, can occur on the valves or the damaged endocardium. These vegetations put the patient at risk for embolic episodes such as strokes. Other complications of infective endocarditis include heart failure, periannular abscess, splenic abscess, pulmonary emboli, and mycotic aneurysms.¹

Mycotic aneurysms are a known complication of infective endocarditis and occur in roughly 1% to 5% of cases.² These aneurysms occur owing to embolization of the vasa vasorum secondary to bacterial or fungal elements and this results in an infection of the arterial wall and ultimately arterial wall dilation.³ Mycotic aneurysms can be found in any artery of the body, but are most commonly found in the aorta and carotid arteries.⁴ Mycotic peroneal artery aneurysms (MPAAs) are rare and are limited to case reports.³⁻⁷ We present a case of symptomatic MPAA in a patient with fungal endocarditis. The patient provided consent for publication of the images and clinical details in this report.

CASE REPORT

A 32-year-old man with a history of IV drug abuse, hepatitis C, and endocarditis underwent mechanical mitral valve replacement (37-mm mechanical St. Jude; Abbott, St Paul, Minn) and



Fig 1. Computed tomography scan of the right peroneal artery aneurysm.

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tricuspid valve annuloplasty (36-mm Edwards MC3; Edwards Life Sciences, Irvine, Calif) 3 years before this evaluation. After this surgery the patient was maintained on coumadin and he discontinued his IV drug use. The patient was not enrolled in any drug

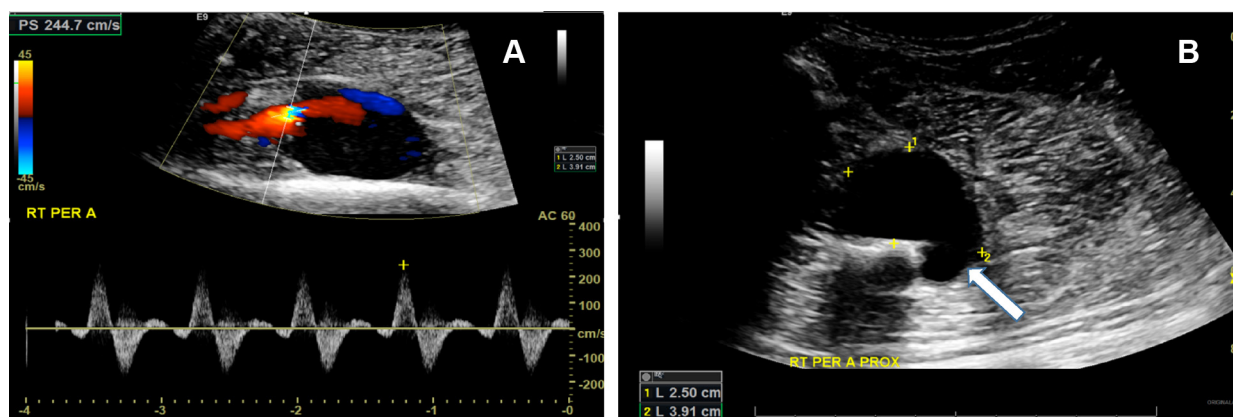


Fig 2. A, Longitudinal view demonstrates flow into aneurysm. B, Transverse view demonstrates aneurysm size (2.5 × 3.91 cm). The arrow demonstrates the peroneal artery.

counselling program and he had a relapse of his IV drug use after 1 year of abstinence. During a workup for fevers and night sweats, he was diagnosed with fungal endocarditis and blood cultures positive for *Candida parapsilosis*. A transesophageal echocardiogram demonstrated a 1.2- × 0.6-cm vegetation on the mechanical mitral valve. The patient was prescribed IV caspofungin and a redo mechanical mitral valve replacement was planned. During a preoperative evaluation, the patient complained of a 2-month history of persistent right calf pain. A computed tomography scan with contrast of the right lower extremity demonstrated a 2.7- × 3.2- × 3.2-cm saccular aneurysm of his right peroneal artery just distal to the tibioperoneal trunk (Fig 1). For this reason, the patient was referred to the vascular surgery clinic.

Upon evaluation, the patient denied symptoms of classic claudication but stated that it hurt when walking and had caused him to limp. The patient's right calf was slightly larger than the left; however, it was tender to palpation. He had a palpable right posterior tibial and dorsalis pedis pulse. A right lower extremity arterial duplex confirmed the MPAA (Fig 2) and that there was inline blood flow to the foot through the other tibial arteries. In the setting of the patient's fungal endocarditis, a diagnosis of a mycotic aneurysm was made. Owing to the compressive symptoms that the patient was experiencing, he was consented for open ligation of the peroneal artery with decompression of the aneurysm sac. Exposure was obtained through a medial approach and a tourniquet was used for proximal control. The peroneal artery was ligated proximally and distally to the aneurysm. The aneurysm was then decompressed. Cultures of the evacuated hematoma and of the aneurysm wall were negative. A completion angiogram confirmed continued perfusion to the foot through the anterior and posterior tibial arteries (Fig 3). The remainder of his postoperative course was uneventful, and he was discharged home on postoperative day 3.

DISCUSSION

An MPAA is a rare diagnosis. To our knowledge, there have only been five prior reports of this diagnosis. Four of these patients presented in a similar manner as our

patient, with calf pain.³⁻⁷ Previous reports of this type of aneurysm have been associated with bacterial endocarditis, specifically *Staphylococcus aureus*, *Streptococcus mitis* groups, and *Acinetobacter*.³⁻⁷ This patient had culture proven *C parapsilosis* endocarditis and was receiving IV antifungals at the time of aneurysm diagnosis. The intraoperative cultures of the hematoma and of the aneurysm wall were negative; however, up to 25% of mycotic aneurysms can be culture negative.⁸ Even though the patient had a previous episode of endocarditis, he did not develop symptoms until after his most recent episode was diagnosed. For this reason, we believe that this patient's MPAA was a result of his most recent episode of infectious endocarditis rather than a consequence of a previous episode.

In this case, the MPAA was diagnosed using both computed tomography and arterial duplex ultrasound scanning. He did not undergo screening for concomitant fungal mycotic aneurysms because the incidence of concomitant fungal mycotic aneurysms is not known and the number of mycotic aneurysms secondary to fungal endocarditis is small.⁹ Mycotic aneurysms secondary to bacterial endocarditis have been studied more extensively secondary to its higher prevalence. Multiple mycotic aneurysms were found in 23% of patients with bacterial endocarditis; however, this report was before the use of antibiotics and valve replacement surgery.¹⁰ Antibiotic therapy has dramatically decreased the incidence of mycotic aneurysms.¹¹ At this time, there are no recommendations on surveillance imaging of other arterial trees in patients with a single mycotic aneurysm. Surveillance imaging would be difficult because mycotic aneurysms can occur in any vascular bed and the imaging would have to be extensive.⁹

The experience with treatment of aneurysms in this location has been limited; however, multiple different techniques have proven to be successful. Open surgical procedures such as arterial ligation, primary repair of



Fig 3. Angiogram of the lower extremity after ligation of the peroneal artery demonstrates patent posterior tibial and anterior tibial arteries.

the artery, and vein bypass have been performed.^{3,5,6} These aneurysms have also been treated by endovascular methods. Both thrombin injection through a balloon catheter and coil embolization in combination with a covered stent has been used.^{4,7} We opted to perform an open repair secondary to the compressive symptoms that the patient was experiencing. Open exploration allows for decompression of compartment syndrome and allows for debridement of any devitalized muscle. The use of the tourniquet at the level of the thigh also

allowed for arterial control. This method could potentially decrease the chance of blood loss from dissection proximal and distal to the aneurysm. Ligation of the peroneal artery was selected because the patient was known to have a patent ipsilateral anterior and posterior tibial artery from preoperative imaging. The approach that we described also does not require prosthetic material to remain in situ, which could be a source of future infection.

CONCLUSIONS

An MPAA is a rare diagnosis. Open ligation and aneurysm sac decompression in patients with adequate collateral circulation is an ideal treatment for those with compressive symptoms from a mycotic peroneal artery aneurysm.

REFERENCES

1. Mocchegiani R. Complications of infective endocarditis. *Cardiovasc Hematol Disord Drug Targets* 2009;9:240-8.
2. Baddour LM, Wilson WR, Bayer AS, Fowler VG, Tleyeh IM, Rybak MJ, et al. Infective endocarditis in adults: diagnosis, antimicrobial therapy, and management of complications: a scientific statement for healthcare professionals from the American Heart Association. *Circulation* 2015;132:1435-86.
3. Albayrak R, Saglam H, Emmiler M, Degirmenci B, Sahin O. Large mycotic aneurysm of the peroneal artery. *J Clin Ultrasound* 2007;35:344-6.
4. Elford J, Ashley S, Wells I, Roobottom C. Mycotic pseudoaneurysm of the common peroneal artery treated with direct human thrombin injection. *Clin Radiol Extra* 2002;57:34-6.
5. McKee MA, Ballard JL. Mycotic aneurysms of the tibioperoneal arteries. *Ann Vasc Surg* 1999;13:188-90.
6. Gandhi V, Shyam V, Unnikrishnan G, Balakrishnan D, Sudhindran S. Ruptured mycotic aneurysm of the peroneal artery. *EJVES Extra* 2005;10:21-3.
7. Ferrero E, Ferri M, Carbonatto P, Viazzo A, Robaldo A, Calvo A, et al. Endovascular treatment of a symptomatic mycotic aneurysm of the peroneal artery. *Ann Vasc Surg* 2011;25:982.e11-4.
8. Brown SL, Busuttil RW, Baker JD, Machleder HI, Moore WS, Barker WF. Bacteriological and surgical determinants of survival in patients with mycotic aneurysms. *J Vasc Surg* 1984;1:541-7.
9. Wilson SE, Van Wagenen P, Passaro E Jr. Arterial infection. *Curr Probl Surg* 1975;115:5.
10. Stengel A, Wolferth CC. Mycotic (bacterial) aneurysms of intravascular origin. *Arch Intern Med* 1923;31:527.
11. Ledochowski S, Jacob X, Friggeri A. A rare case of *Streptococcus agalactiae* mycotic aneurysm and review of the literature. *Infection* 2014;42:569-73.

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