SHORT REPORT

Bilateral True Aneurysms of Popliteal and Posterior Tibial Arteries

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Introduction

Although rare, aneurysms of the infrapopliteal arteries are commonly associated with trauma. However, the combination of bilateral popliteal aneurysm with true bilateral aneurysms of the posterior tibial arteries has not been previously described. Here, as well as reviewing the relevant literature, we report the clinical and radiological aspects, and the surgical management of a 60-year-old man with both bilateral popliteal aneurysm and true bilateral aneurysms of the posterior tibial arteries.

Case Report

A 60-year-old man sought medical attention for an 8-month history of a pulsating mass in the left ankle, gradually increasing in size. The mass was asymptomatic. The patient had mild hypertension, and denied any history of trauma. Physical examination revealed a pulsatile mass over the posterior tibial artery (PT) in both ankles, and an enlarged popliteal pulse on the right. No pedal pulses were observed and standard laboratory blood tests were normal. He underwent a duplex scan that demonstrated the presence of a small abdominal aortic aneurysm (42 mm) and a bilateral popliteal aneurysm combined with a bilateral posterior tibial artery aneurysm. These findings were confirmed by arteriography (Figs 1 and 2) while the rest of the arteries in the legs appeared to be normal. Both dorsalis pedis arteries were absent.

On the right side, the popliteal aneurysm was excluded and a reconstruction performed using a venous bypass graft sutured side-to-end to the popliteal above the knee and end-to-side below the knee. The PT aneurysm was resected and a venous graft interposed in an end-to-end position.

There were no complications and 10 days later the popliteal aneurysm was resected using a posterior approach with interposition of an ipsilateral saphenous vein graft. The left PT aneurysm was also resected and the reconstruction performed with an end-to-end vein graft. There were no postoperative complications; at follow-up 2 years later the grafts were patent and the patient remained symptom-free.

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swelling of the leg as the result of venous stasis.\textsuperscript{2–4} Our patient was asymptomatic and he sought medical attention for a pulsating mass in the left ankle.

Duplex scanning is the method of choice in the diagnosis of both popliteal and infrapopliteal aneurysms. However, arteriography gives important information about proximal and distal vessels and we think that this information is essential for reconstruction, especially in aneurysms of distal vessels in which ligation or venous graft interposition must be considered.

It is widely agreed that surgical repair should be employed in all patients with popliteal artery aneurysms – symptomatic and asymptomatic – because of the high risk of peripheral embolisation or thrombosis that may become limb-threatening, and the very good results achieved with surgery. The best graft material for reconstruction is autologous saphenous vein.\textsuperscript{5} However, due to the rarity of infrapopliteal artery aneurysms the standard treatment of these lesions remains controversial.

Although asymptomatic and large lesion aneurysms should be repaired,\textsuperscript{6,7} the best way to manage asymptomatic lesions remains unclear. Some authors postulate that asymptomatic infrapopliteal aneurysms are best observed closely\textsuperscript{8,9} but complications such as embolisation or thrombotic arterial occlusion are likely to occur.\textsuperscript{10} Mönig et al.\textsuperscript{11} recommend surgical resection. We also think that asymptomatic infrapopliteal aneurysms should be considered for surgical reconstruction with autologous veins wherever possible.

The surgical management of aneurysms of the popliteal artery is well established but the best way to manage infrapopliteal lesions is still poorly defined. Ligation with or without excision is the most commonly performed operation. The arteriographic findings in our patient were crucial to the success of the surgical approach. The arteriogram demonstrated the

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\begin{tabular}{|c|c|c|c|c|}
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Author & \(n\) & Age & Male/female & Localisation & Operation	tabular {\hline
Pappas\textsuperscript{12} & 1 & – & – & Posterior tibial artery & –
Carey\textsuperscript{1} & 1 & 79 & M & Anterior tibial artery & Ligation
Izquierdo\textsuperscript{17} & 4 & – & – & – & Ligation/venous bypass interposition
Jenyo\textsuperscript{3} & 1 & 60 & F & Posterior tibial artery & Ligation
Yao\textsuperscript{1} & 1 & 46 & M & Posterior tibial artery & –
Rowe\textsuperscript{4} & 1 & 67 & M & Posterior tibial artery & Excision
Borozan\textsuperscript{6} & 1 & 61 & F & Anterior tibial artery & Ligation
Katz\textsuperscript{7} & 1 & 37 & M & Posterior tibial artery & Venous bypass
Kars\textsuperscript{14} & 1 & 60 & M & Anterior tibial artery & Ligation
Hasaniya\textsuperscript{10} & 1 & 32 & F & Posterior tibial artery & Ligation
Mönig\textsuperscript{11} & 2 & 69/39 & M & Tibioperoneal trunk & PTFE-bypass/venous patch
Cappendijk\textsuperscript{2} & 1 & 69 & M & Tibioperoneal trunk & Venous bypass
McKee\textsuperscript{9} & 1 & 71 & M & Dorsalis pedis artery & Ligation/excision
Current study & 2 & 60 & M & Posterior tibial artery & Excision/venous graft interposition

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Fig. 2. Angiography of the right leg, demonstrating aneurysms of the popliteal and posterior tibial arteries. Note the absence of pedal artery.

\textbf{Discussion}

Infrapopliteal aneurysms are rarely reported, although their true incidence is probably higher than the literature suggests. There are only 17 published cases of non-traumatic infrapopliteal aneurysms up to March 2001 (Table 1). Moreover, as far as we know, the combination of a true bilateral aneurysm of the popliteal and the posterior tibial arteries is unique in the English literature.

Whilst the hydrodynamic force exerted on the vessel wall is probably the most important factor in the production of an aneurysm,\textsuperscript{1} the gradual change from a pulsatile flow to continuous flow in the periphery could be responsible for the rarity of non-traumatic aneurysms of small vessels.\textsuperscript{2}

Of the cases reported, most were detected by chance during the diagnosis of peripheral obstructive vascular disease, whilst three cases were detected due to a

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absence of both pedal arteries despite an adequate posterior tibial artery supply to his feet. This persuaded us to interpose a saphenous vein graft after resection of the posterior tibial artery aneurysms in order to maintain the blood supply to the foot.

References