

CASE REPORT

A case of popliteal artery stenosis: masquerading as an infective foot ulcer in a young male traveller

D. Dawson*, G. McLean, and A. Wilson

Trauma and Orthopaedics, Royal Victoria Hospital, Belfast, UK

*Correspondence address. Trauma and Orthopaedics, Royal Victoria Hospital, Belfast BT12 6BA, UK. Tel: +44-7590540770; E-mail: dandawson@doctors.org.uk

Abstract

Here, we present a case report of a young male who had been travelling in Thailand. The patient sustained a relatively minor trauma to the soft tissue under his left third metatarsal head on a piece of coral reef. He subsequently developed an infected ulcer, which did not heal despite appropriate antibiotic therapy and surgical debridement. Unfortunately, the patient required amputation of the left third toe and metatarsal head due to osteomyelitic destruction. It later transpired that the ulcer was initially ischaemic in nature due to previously undiagnosed and asymptomatic popliteal artery stenosis.

INTRODUCTION

Popliteal artery stenosis or occlusive disease is a common occurrence in elderly patients, diabetics, smokers and those with cardiovascular disease. It leads to significant morbidity and mortality by reducing or completely blocking blood supply through the popliteal artery and into the lower leg. This can result in tissue ischaemia and limb loss.

We describe an unusual presentation of a 24-year-old male with a popliteal artery stenosis masquerading as an infective foot ulcer. We believe this case illustrates the importance of a meticulous history and physical examination when assessing foot ulcers.

CASE REPORT

A 24-year-old male attended the department with a painful ulcer under the third metatarsal head of his left foot. The foot was erythematous, swollen and hot to touch. This ulcer had been present for 2 months prior to presentation following a skin laceration sustained while travelling in Thailand. The patient had received antibiotic therapy and surgical debridement on two occasions while abroad; however, the ulcer had failed to heal. On closer questioning the patient reported that he

sustained the injury while walking close to coral reef in the sea in Thailand. There had been no history of freshwater exposure, drug misuse or of any risk-taking behaviour. He had no past medical history.

Initially, the patient was treated with empirical antibiotics on instruction from our microbiology department. Wound swabs grew *Proteus* sp., *Provalencia* sp. and *Mirabilis*. Antibiotic therapy was altered according to these sensitivities, and the erythema and swelling began to settle over the coming weeks. Unfortunately, the ulcer continued to enlarge and a MRI scan of the left foot revealed increased uptake in the third toe and metatarsal head indicating underlying osteomyelitis.

The ulcer was formally explored and debrided in theatre. During surgery, it proved necessary to amputate the third toe and metatarsal head as they could not be salvaged due to infective destruction. On conclusion of the procedure, the tourniquet which had been applied to the lower limb was deflated and it was noted that the left foot was slow to reperfuse. A vascular opinion was sought.

Vascular studies were requested. Ankle brachial pressure index (ABPI) in the left leg was 0.46 when compared with 0.82 in the right leg, indicating a significant decrease in arterial blood flow to the left foot. A CT femoral angiogram demonstrated

Received: December 11, 2014. Accepted: January 15, 2015

Published by Oxford University Press and JSCR Publishing Ltd. All rights reserved. © The Author 2015.

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited. For commercial re-use, please contact journals.permissions@oup.com

a left popliteal short segment occlusion with reforming of the tibio-peroneal trunk with small vessels. On detailed probing, a history of intermittent claudication was revealed with a claudication distance of ~100 m.

Subsequently, a left superficial femoral artery to popliteal artery bypass was performed by the vascular team using a reverse vein graft. Within 6 weeks, all antibiotic therapy had been stopped and the wound from amputation on the left foot had completely healed.

DISCUSSION

Stenosis of the popliteal artery is a common condition, most often seen in the context of peripheral vascular disease where an atherosclerotic pathogenesis is accountable. However, in a cohort of younger patients, there is a much broader range of pathogenesis accounting for such stenosis. Conditions such as popliteal artery entrapment syndromes (PAES) [1], popliteal artery aneurysm [2], cystic adventitial disease, multiple hereditary exostosis [3], some arteritis disorders (e.g. Takayasu's) and some rare congenital syndromes (e.g. Cutis marmorata telangiectatica congenital [4]) must be considered. In each of these conditions, there is an underlying disease process that culminates in a reduction in the cross-sectional area in the popliteal artery and consequently, flow through the vessel is decreased in accordance with Laplace's Law. The timescale of onset and progression of symptoms varies greatly. In congenital stenosis, there is an insidious process that can be unmasked by an acute insult (e.g. trauma and embolism).

The presentation of congenital popliteal artery stenosis is very similar to that in peripheral vascular disease, with intermittent claudication, slow healing wounds and transitory change in skin colour and temperature [5]. A persistent wound or ulcer in a young and otherwise fit individual with no obvious predisposing factors is a red flag and should prompt further investigation. A thorough history with targeted questioning of the above presenting symptoms is important, followed by rigorous physical examination.

Initial bedside assessment of vascular status should be performed with ABPIs and Doppler flow studies [6]. Blood flow may be posturally dependent in approximately a third of PAES cases [6]; however, this is unlikely to be the case with a fixed stenosis of the popliteal artery. Arteriography should be considered if there is sufficient clinical suspicion of vascular compromise. CT is a useful adjunct if external compression of the artery is a

possibility [7]; furthermore, MRI is useful in adventitial cystic disease [6].

Management of vascular insufficiency in young patients depends on the underlying pathogenesis. In adventitial cystic disease, symptoms may resolve spontaneously if cysts rupture; however, recurrence is common [6]. In congenital popliteal artery stenosis, vascular bypass is often required as with the 24-year-old gentleman under consideration here.

In conclusion, this case emphasizes the importance of maintaining a broad differential diagnosis in young individuals presenting with persistent foot ulcers. In a young person with a persistent non healing ulcer, with unusual bacteriology and normal pulses, always consider a proximal vascular lesion. A prompt diagnosis of an unusual congenital vascular insufficiency can prevent complications and long-term morbidity for the patient.

CONFLICT OF INTEREST STATEMENT

None declared.

REFERENCES

1. Metz R, de Borst GJ, Verhagen HJ, Moll FL. Popliteal artery entrapment syndrome: suggestions for diagnostic and therapeutic clues. *Ned Tijdschr Geneesk* 2011;**155**:2580.
2. Gao X, Qi L, Chen B, Yu H, Li J, Zhang J. A rare case of giant popliteal artery aneurysm in a young adult. *Vascular* 2011;**19**:342–5.
3. Zonnenberg CB, van Noort A, Nio D. Occlusion of the popliteal artery caused by bony exostoses. *Ned Tijdschr Geneesk* 2011;**155**:2527.
4. Vogel AM, Paltiel HJ, Kozakewich HP, Burrows PE, Mulliken JB, Fishman SJ. Iliac artery stenosis in a child with cutis marmorata telangiectatica congenital. *J Pediatr Surg* 2005;**40**:9–12.
5. Stephens E. Peripheral vascular disease. <http://emedicine.medscape.com/article/761556-overview> (10 October 2014, date last accessed).
6. Elias D, White L, Rubenstein JD, Christakis M, Merchant N. Clinical evaluation and MR imaging; features of popliteal artery entrapment syndrome and cystic adventitial disease. *AJR Am J Roentgenol* 2003;**180**:627–32.
7. Papiioannou S, Tsitouridis K, Giataganas G, Rodokalakis G, Kyriakou V, Papastergiou C, et al. Evaluation of popliteal arteries with CT angiography in popliteal artery entrapment syndrome. *Hippokratia* 2009;**13**:32–7.