Physical Signs Unusual causes of calf swelling – 3

Popliteal vein obstruction by an osteochondroma of the proximal tibia

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Summary: Vascular complications of osteochondroma are uncommon. We report a case of popliteal vein obstruction by an osteochondroma, arising from the proximal tibia, in which the diagnosis was initially missed. The pathogenesis and management of these complications are discussed.

Introduction

Osteochondroma is the most common tumour arising from bone, yet the majority of osteochondromas remain asymptomatic or present as a slowly enlarging lump.^{1,2,3} Occasionally they become symptomatic due to skeletal deformity, fracture of the stalk of a pedunculated osteochondroma, development of a reactive bursa in relation to the cartilage cap, limitation of joint movement, malignant degeneration, or by causing vascular or nerve compression.^{1–4} Vascular complications of osteochondromas are rare. We report what we believe is the first recorded case of popliteal vein obstruction by an osteochondroma arising from the proximal tibia.

Case report

The patient was a 21 year old man from India. Eighteen months previously, a twisting injury of his right knee had been followed by transient calf swelling lasting two days. He remained asymptomatic until three months before admission when he noticed that walking caused undue fatigue of his calf muscles. Two months later he developed painless swelling of the ankle and calf. He was admitted to hospital with a clinical diagnosis of deep vein thrombosis. Anticoagulation was begun with heparin and a venogram was arranged. Thrombus was not present, but it showed an extrinsic mass which obstructed the popliteal vein. Proximal veins filled via collaterals (Figure 1). A plain radiograph confirmed that the mass was an osteochondroma arising from the proximal tibia (Figure 2).

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The patient was then referred to the orthopaedic department. The calf was swollen, the circumference being increased by 5 cm. There was no erythema or tenderness of the calf. The tumour was palpable as a hard mass in the popliteal fossa, with no swelling of the surrounding soft tissues. The dorsal pedal and posterior tibial arterial pulses were normal.

The tumour was approached through the popliteal fossa and the mass was excised flush with the tibia, leaving the vessels free. Histology confirmed that the mass was an osteochondroma.

One week later the calf was still slightly swollen. A repeat venogram showed that the popliteal vein was still occluded and the proximal vessels were filled through a stenosed but patent collateral vein (Figure 3). Heparin therapy was discontinued. Six months following surgery the patient was asymptomatic and the calf swelling had resolved.

Discussion

There are some 35 recorded cases of popliteal artery aneurysms or pseudoaneurysms related to osteochondromas.^{2,5} The great majority were in males, with an average age of 19 years, and are caused by abrasion of the artery by sharp bony spikes left on the surface of the osteochondroma as the cartilage cap involutes at skeletal maturity.⁴ The osteochondromas responsible for these lesions typically arose from the distal femur, and only three were attached to the proximal tibia.^{5,6} Venous complications are much less frequent. It is thought that the posterior position of the popliteal vein protects it from damage.² It is also more mobile than the popliteal artery which is fixed proximally in the adductor canal and distally by its branches, the

Figure 1 Venogram: extrinsic mass causing proximal veins to fill via collaterals.

Figure 2 Radiograph: typical osteochondroma, expanding into the popliteal fossa, from its attachment to the proximal tibia.

anterior and posterior tibial arteries.^{4,6} We have found only two cases of popliteal vein compression associated with an osteochondroma, both of which arose from the distal femur.^{2,7}

The patients with arterial injuries often gave a history of minor trauma, with subsequent pain and rapid swelling in the popliteal fossa, leading to an early presentation to hospital. Distal arterial pulses were frequently absent.⁸ The patients with popliteal vein compression gave a longer history of painless swelling of the calf developing over several weeks, and their distal pulses were preserved.

In the diagnosis of pain and swelling in the popliteal fossa one should be aware of the various vascular complications of osteochondromas. Where indicated, arteriography, venography, and vascular surgical advice should be obtained before surgery. The potential vascular complications of osteochondromas in the popliteal fossa are serious and several authors have recommended their prophylactic excision.^{6,9}

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Figure 3 Postoperative venogram showing the base of the pedicle (◆) and the patent but stenosed collateral vein (→).

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