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Tumours arising in the sole of the foot: Pitfalls in diagnosis

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Summary

Tumours arising from the plantar aspect of the foot are rare, have a delayed presentation and are frequently misdiagnosed. The authors report a series of five cases where in, the cases presented late and were being treated as ulcers or insignificant swellings. This article highlights the need for high degree of suspicion, appropriate investigations and excisional biopsy of all lesions arising in the sole of the foot.

Keywords: Sole tumours; delayed diagnosis; excisional biopsy

1. Introduction

Tumours of the foot are rare with an approximate incidence of 4% [1]. Soft tissue tumours are approximately twice as common as bone tumours in the foot [2]. Based on published studies, any given soft tissue tumour in the foot has about a 1 in 4 chance of being malignant [3,4]. The foot is relatively deficient in somatic soft tissue elements and rich in tendons, fasciae, retinaculae and synovium. Corresponding with this distribution, the common soft tissue neoplasms in the foot include ganglions, fibromatosis and tendon sheath tumours [5].

Tumours arising in the sole of the foot are commoner than in the dorsum. According to Ozdemir et al tumours arising in the phalanges are twice as common than those from the plantar aspect or the heel [1]. The histotype of lesions in the plantar area or in the phalanges tends to be benign, while those in the heel of the foot are generally malignant [6].

History and clinical examination give no specific clues of tumour lesions in the foot. Also, patients do not routinely examine their soles, especially if there are no symptoms. Most physicians do not place tumours as a priority diagnosis when dealing with lesions in the sole that are difficult to palpate due to the thick plantar skin. They are usually mistaken for diabetic ulcers, callosities, fibromatosis and other benign lesions such as ganglions and treated by podiatrists. All these factors lead to a delay in presentation and can affect outcome.

We report five cases of soft tissue tumours arising in the sole of the foot. They were being treated as non-tumourous conditions or swellings of minimal significance. Delay in presentation and diagnosis was the most striking and worrying feature.

2. Cases

Case 1. A 49-year-old type II diabetic, presented with a 30-month history of a slowly growing non-healing ulcer on his left sole being treated by the diabetic team as a chronic diabetic ulcer. He also had a large mass in his right groin, which was steadily growing. On clinical examination, there was a fungating, granulomatous lesion on the sole of the foot underneath the big toe, 3×2 cm in size. MRI Scan was performed and excision biopsy revealed a firm, nodular fibrous tissue mass measuring $6 \times 6 \times 1$ cm. Histopathology confirmed a malignant melanoma. CT scan of the chest revealed secondaries and the patient was treated with chemotherapy. The patient died from metastases one year later.

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Case 2. A 78-year-old Asian female who is an insulin dependent diabetic presented to the Orthopaedic clinic with a 2-year history of an ulcerative lesion on the sole of her left foot. This was being treated in a diabetic clinic as a chronic diabetic ulcer. Physical examination showed a 3×4 cm fungating, dry and brown lesion between the first and second toes. Owing to the chronicity, non-healing nature and an indurated base of the ulcer, an MRI Scan was performed. A soft tissue mass was identified on the scan but its nature was unclear (Fig. 1). An excision biopsy showed a firm fibrous tissue mass measuring 7×5×3 cm. Histopathology revealed a malignant melanoma and excision was complete. Further investigations to exclude distal metastasis were negative. The excision site needed regular dressings for a long period of time and skin grafting was necessary to obtain cover. One and half years after excision, the patient is asymptomatic with relatively normal gait with no evidence of recurrence or metastases.

Case 3. A 70-year-old previously healthy man presented with a fleshy lump on the sole of his right foot of 18 months duration, which was noticed by his wife while massaging his foot. He also had a small nodule in the left palm. There was no history of pain or any discomfort. Physical examination of the foot revealed a 1×2 cm lump on the outer border of the foot. The lesion on his sole was provisionally diagnosed as a Dupuytrens nodule or a callosity. An MRI scan was performed (Fig. 2) followed by an excision biopsy. The mass was made of fibro-fatty connective tissue,measuring 4×3×1.5 cm and histology confirmed a fibroma of the tendon sheath. At one year the patient was mobilising well but had a mild limp due to scar tenderness.

Case 4. A 57-year-old healthy man presented to our clinic with a 2-year history of an asymptomatic lump in his right sole. On clinical examination there was a tender lump between the first and the second toes measuring 3×2 cm. MR scan of the foot showed a 4 cm soft tissue mass which was arising from the sole of the forefoot, beneath the second toe closely abutting the undersurface of the flexor tendon. There was central necrosis, strongly suggestive of synovial sarcoma. An excision biopsy was carried out and the lesion was 5×3×2 cm containing fibrous tissue and fat attached to the skin with marked calcification. Histopathology confirmed an extraskeletal or soft tissue chondroma with heavy calcium pyrophosphate deposition. Two years after excision, patient was mobilising well with no limp.

Case 5. A 35-year-old female noticed a small swelling on the sole of her left foot for 15 months and had not seen a physician previously, as the lesion was asymptomatic. Examination of the sole of her foot revealed a 4×1.5 cm

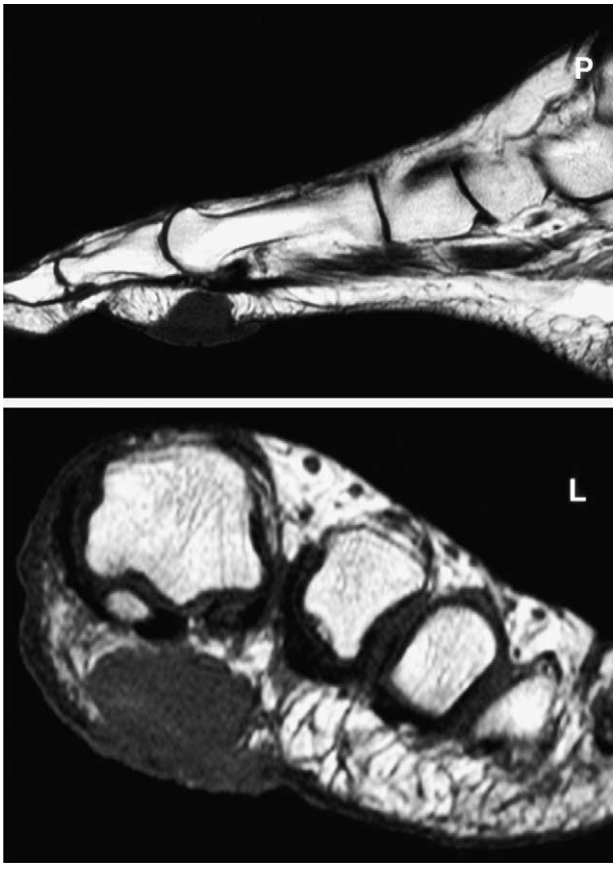

Fig. 1. Sagittal and axial MR Scan images (Case 2—malignant melanoma) showing a soft tissue mass beneath the big toe.

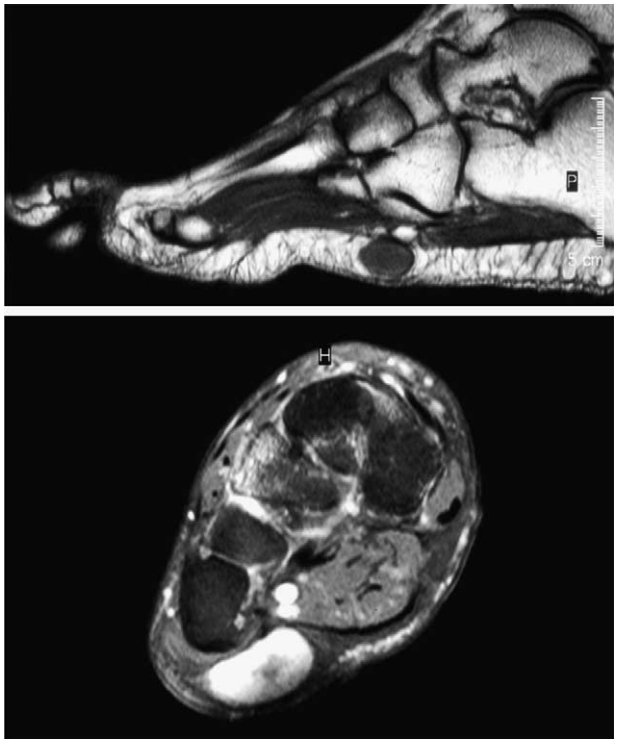

Fig. 2. Sagittal and axial MR Scan images (Case 3—fibroma of tendon sheath) showing the lesion arising from the sole not involving the deeper structures.