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Intraosseous lipoma of the calcaneus: The non-stereotypic lesion of the bone

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ABSTRACT

Background: Intraosseous lipoma is one of the rarest benign bone tumour. They have been identified in the tibia, fibula, metatarsals, and calcaneal. They are easily misdiagnosed as the clinical presentation is nonspecific and can mimic other ligamentous or soft tissue injury.
Case presentation: We described a 40-year-old patient with a chronic dull pain at sole of foot without significant physical findings apart from minimal swelling over the lateral ankle and local tenderness over the anterior talofibular ligament, lateral talocalcaneal joint and minimal pain at the base of left heel. MRI revealed features of suggestive of anterior talofibular ligament (ATFL) and calcaneofibular ligament (CFL) sprain with incidental finding of calcaneal intraosseous lipoma. Intraosseous calcaneal lipoma was treated with surgical curettage and bone graft due to the non-resolving nature of the pain despite conservative effort. Patient was symptom free and bony consolidation was visible in radiographs. No evidence of local recurrence seen and patient able to return to normal daily activities without any restrictions. Intraosseous lipoma of the calcaneus is an even rarer subset of osteolipoma and is often identified incidentally during radiologic examination, having no specific symptoms besides heel pain at the worst. Diagnosis is usually made accidentally on radiographs images. CT or MRI scans are used to confirm the fatty nature of the lipoma.
Conclusions: Intraosseous lipoma of the calcaneal is very infrequent benign tumour-like lesion that can appear with pain but can also be asymptomatic and discovered incidentally by imaging investigation. To reach the diagnosis it is usually enough to have simple x-ray and CT or MRI. It has good prognosis, usually it improves with rest and analgesia. On occasions, excision and curettage of tumour and bone grafting, or cementation can be necessary as treatment modalities in cases that failed conservative management.

1. Introduction

Lipomas are common benign soft tissue neoplasm composed of mature adipose tissue with no evidence of cellular atypia. Benign lipomas can affect bone, joint and the tendon sheath, and other soft tissues. Intraosseous lipoma is the rarest bone tumour[1]. Despite the large amount of bone marrow in the human skeleton, intraosseous lipoma (IOL) considered infrequent, accounting less than 0.1% of all primary tumours of the bone[4]. In this study, we present one calcaneal IOL patient treated with curettage and synthetic bone grafting. The purpose of this article is to increase awareness among orthopaedic surgeons of the existence of this lesion and the benefits of surgical excision and curettage with bone graft for patient with symptomatic IOL.

2. Case report

A 40-year old man sprained his left ankle during a sport activity and consulted a physician and was treated conservatively for 2 weeks because the initial radiographic examination showed no evidence of bone abnormalities or fracture and unfortunately, the x-ray was not available to us as patient had initially seek treatment at a general practitioner and did not have a copy of the x-ray. The pain persisted for three months and he complained of insidious progressive difficulty in ambulating, associated with heel pain that limits his daily activities. The pain was dull aching in nature, increasing intensity and was aggravated by walking on uneven surface. He presented to our department for further assessment. Upon physical examination, there were minimal swelling over the lateral ankle and local tenderness over the anterior talofibular ligament, lateral talocalcaneal joint and minimal pain at the base of left heel. Otherwise there were no evidence of

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Fig. 1. A lateral radiograph of left ankle shows a small cystic lesion in the neck of the calcaneus.

ankle instability and medial ankle joint pain. Ankle range of motion was full without any restrictions. In the radiologic study, we found a well-defined cystic lesion in the calcaneus (Fig. 1).

A magnetic resonance imaging (MRI) revealed features suggestive of anterior talofibular ligament (ATFL) and calcaneofibular ligament (CFL) sprain with incidental finding of calcaneal intraosseous lipoma. (Figs. 2a & b).

The haematological laboratory data and biochemical study showed no significant abnormalities. Based on the clinical and radiology findings, a diagnosis of ATFL and CFL sprain was made and a symptomatic intraosseous calcaneal lipoma was suspected.

It was at this point that the surgical option was given and patient underwent excision and curettage of intraosseous lipoma with synthetic bone graft (integra osteosparx demineralised bone matrix).

A lateral approach to the calcaneal was performed, with the calcaneal cyst identified using image intensifier. Bone window was created over the lateral calcaneal wall and cyst content were curetted. Bone defect was filled with Demineralized Bone Matrix synthetic bone putty. Grossly, the excised tissues were soft cystic with yellowish fatty material. The subcutaneous tissue was opposed with vicryl 2/0 and skin closed with dafilon 4/0 sutures. A boot cast was applied, with initial non weight bearing regiment for two weeks for soft tissue healing. Subsequently, partial weight bearing for four weeks and then full-weight bearing was allowed as tolerated.

Histopathologic specimens of left calcaneal tissue showed fragment lipomatous lesion composed of mature univacuolated adipocytes separated by fibrovascular septa (Figs. 3a & b).

At postoperative 5 months, patient was symptom free and bony consolidation was seen with radiographs. No evidence of local recurrence seen and patient able to return to normal daily activities without any restrictions.

3. Discussion

Intraoseous lipoma has an unknown aetiology. Three theories have been considered: a traumatic origin and later fat degeneration, infections, or osseous fat infarction with metaplasia and third, at present moment most studies think that intraosseous lipoma is a primary tumour of marrow fat. It represents 0.1% of primary bone tumours[2]. The most frequent symptom is the affection of the calcaneus and is related to standing or exercise[3]. Intraosseous lipoma has no gender predilection and can occur at any age, often occurring in the fourth decade[4]. Intraosseous lipoma of the calcaneus is an even rarer subset of osteolipoma and is often identified incidentally during radiologic examination, having no specific symptoms besides heel pain at the worst[5]. Even though patient had a sprained before the lipoma was detected, treating the sprained aggressively would not have prevent its occurrence. The authors postulated that the lipoma had induced inflammatory process and microfracture. We, however, could not prove this opinion as the MRI was done three months post trauma which by that time the microfracture would have healed. Diagnosis is usually made accidentally on radiographs images. CT or MRI scans are used to confirm the fatty nature of the lipoma. In MRI, the images harnessed in T1(high intensity), T2 (shortening of signal), and STIR(complete fat suppression) image help to confirm the diagnosis of normal fat existence. Non-surgical option such as nonsteroidal anti-inflammatory drugs, cold compression, use of non-weight bearing devices such as walking frame and silicone cast are commonly used modalities for this condition. Long standing cases may complicate into pathological fractures and become symptomatic. These cases require surgical intervention at the earliest. Surgery is indicated in the presence of pain resistant to conservative management.

The case presented in this article was diagnosed with the help of magnetic resonance imaging (MRI) and histopathologic analysis, after which the patient was treated by means of curettage and packing a bone graft substitute (DBX). The treatment most frequently consists of debridement of the injury through an ample bone window, with later filling of the defect with autologous, allograft, bone hydroxyapatite or polymethylmethacrylate (PMMA) cement. In practice, curettage with bone grafting is the treatment of choice when surgical intervention is needed[5]. The study of lesions with CT or MRI due to its capacity to identify the component in the lesion, has been proposed to avoid a biopsy of the lesion in order to confirm the diagnosis. Malignant transformation is rare. In spite of it, there a few cases of malignant transformation of pre-existing bone lipoma in femur and tibia, but never in calcaneus[6].

In summary, the intraosseous lipoma of the calcaneal is very

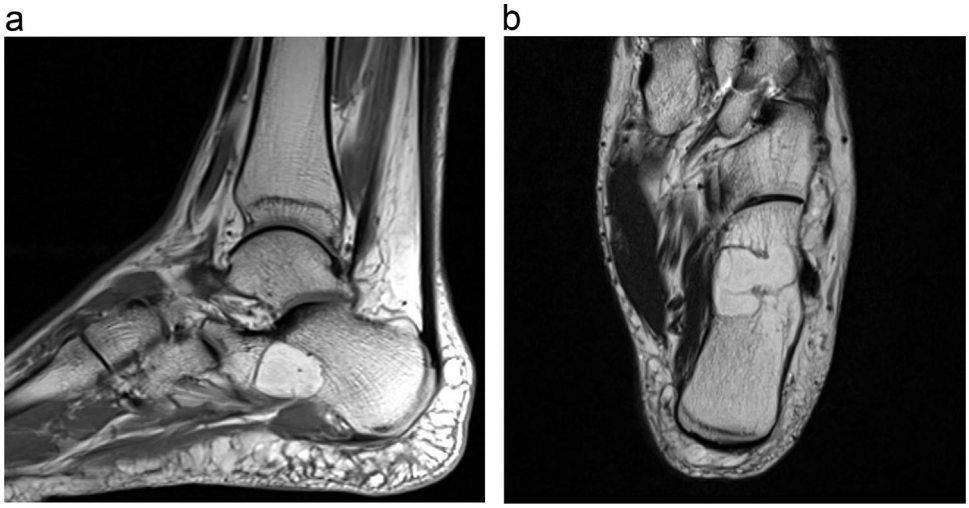

Fig. 2. a & 2b A MRI scan shows a well defined ovoid lesion with uniform high signal intensity on T1-weighted image, in the neck of calcaneum.

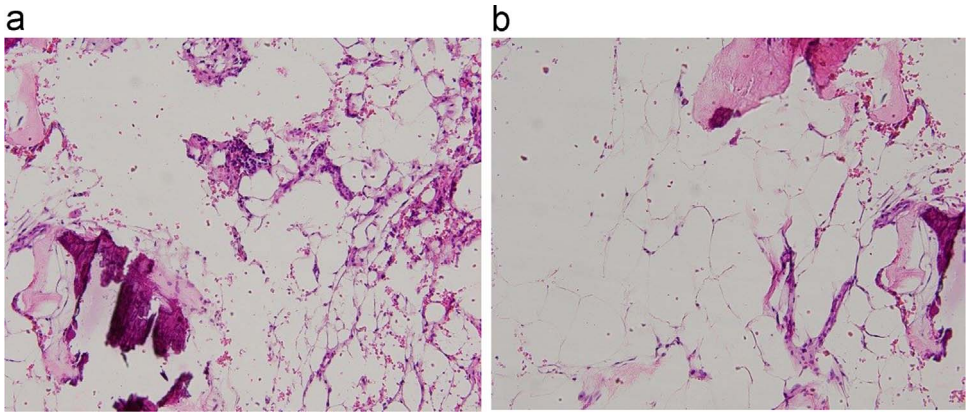

Fig. 3. a & 3b Specimens labeled as intracalcaneal tissue consist of areas with thin woven bone and haemorrhage is noted in between lipomatous lesion. No lipoblast seen.

infrequent benign tumour-like lesion that can appear with pain, of one ankle, but can be asymptomatic and be discovered radiographically with x-rays. To reach the diagnosis it is usually enough to have simple x-ray and CT or MRI. It does not require a biopsy. It has good prognosis, usually it improves with rest and analgesia. On occasions, excision and curettage of tumour and bone grafting, or cementation can be necessary as treatment modalities in cases that failed conservative management.

4. Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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Conflict of interest

None to disclose.

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