



## Osteochondroma at an Unusual Site - A Case Report

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### Abstract

**Introduction:** Osteochondromas are the most common type of benign bone tumours, which usually present as a solitary nonhereditary lesion along the shaft of long bones. Osteochondromas are generally asymptomatic and at most times, the only significant complain is of a painless slow-growing mass over the involved bone. The scalloping effect and increased localised pressure due to the tumour are hypothesised to be the main aetiology of the pain. These tumours should be evaluated to rule out any malignant changes prior to surgical management. Complete surgical excision is the treatment of choice, so as to relieve pain caused by expanding nature of the tumour and prevent a pathological fracture through affected region.

**Case Report:** We present a case of an Osteochondroma of the 4<sup>th</sup> metatarsal in a 16-year-old male, presenting with pain and swelling over the affected foot as the chief complaint. On physical examination, a solitary bony hard swelling was palpated in 4<sup>th</sup> web space of the foot MRI was done to rule out any malignant changes prior to surgical excision of the tumour. scan of the foot showed a cartilage capped bony outgrowth, arising from the distal 4<sup>th</sup> metatarsal along plantar as well as dorsal aspect and extending into the 4<sup>th</sup> web-space. The mass was excised en bloc.

**Conclusion:** The osteochondroma in the metatarsal is rare but should be kept in mind as an unusual aetiology of a painful foot even at the young age group.

**Keywords:** Osteochondroma; Exophytic Mass; Benign Tumour; Surgical Excision

### Introduction

Osteochondroma is the most common type of benign bone tumour, comprising 30 % of all benign bone tumours and 10-15% of all bone tumours [1,26]. WHO defines it as a cartilage-capped bony mass, protruding through the external surface of a bone, containing a marrow cavity. It lies in continuity with the underlying bone [3,4]. Most of these usually present as a solitary, non-hereditary lesion. Approximately 15% of osteochondromas occur in milieu of Hereditary multiple osteochondromas (HMOs), having an autosomal dominant inheritance.

Most common site over which solitary osteochondromas appear are the metaphysis of long bones, especially the femur, tibia and humerus. It's granted that any part of the skeleton can be involved [1-5]. Osteochondromas are generally asymptomatic and at most times, the only significant complain is of a painless slow-growing mass over the involved bone [16]. Patient usually approaches Healthcare with secondary complications of the tumour such as a pathological fracture, bony deformity or mechanical obstruction to range of motion at the involved joint. An osteochondroma can arise near a nerve or blood vessel, the commonest being the Popliteal nerve and artery. The affected limb may show evidence of numbness, weakness, loss of pulse or changes in colour [17].

Complications like vascular compression, arterial and/or venous thrombosis, aneurysm or pseudoaneurysm formation may lead to claudication, swelling and acute ischemic changes of the involved limb. Nerve compression occurs in about 20% of patients and may present with loss of/ altered sensations over the extremity [18,19]. A true osteochondroma is infrequent in the foot and ankle<sup>2</sup>. They show a gradual increment in its size until the patient attains skeletal maturity. Characteristically, the osteochondroma is neglected for a long period of time until it starts to impair daily activities due to pain, restricted joint movement and paraesthesia due to secondary complications like a pathological fracture, bursitis, neurovascular compromise or rarely a malignant transformation [27]. Rate of malignant transformation associated with this benign tumour is about 1-2% and that with an HMO associated Osteochondroma it is about 1-25% [5-7].

In this report, we describe a rare site of osteochondroma i.e., the fourth metatarsal in a 16-year-old male.

### Case Presentation

A 16-year-old male patient, presented with complains of swelling over his right foot since 2 years and pain over the same since past 4 months. The swelling was present over the dorsum of the 4th metatarsal of right foot. It had progressively increased in size over the past 2 years up to its current dimensions. (Figure 1) Patient complained of a vague dull aching pain on weight bearing and an impairment in his activities of daily living since last 4 months. On physical examination, a solitary bony hard swelling was palpated in 4th web space of the foot. The swelling appeared to be in continuity with the dorsal surface of the 4th metatarsal. Having dimensions of approximately 4\*3\*2 cm, it was a non-tender hard swelling with well-defined margins. The surrounding skin appeared to be normal and non-erythematous, with no evidence of previous scarring and/ or discharging sinuses. (Figure 1) No localised rise of temperature was appreciated.

There was no evidence of a similar swelling to be present elsewhere in the body. The movements of the foot were painful on examination.

Plain radiographs of the affected foot in antero-posterior and oblique views showed evidence of a large exophytic mass arising from neck and shaft of the 4th metatarsal (Figure 2).

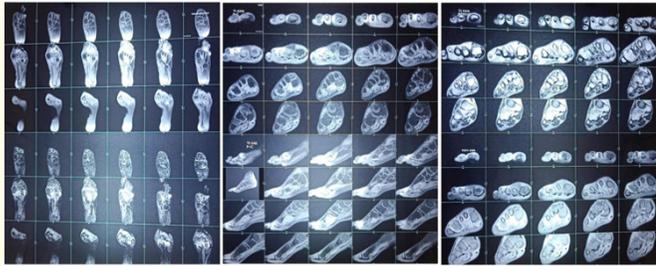


**Figure 1:** Clinical image of the swelling over dorsum of right foot.



**Figure 2:** Radiograph of right foot in AP and oblique views showing a large exophytic mass arising from the neck and shaft of the 4th metatarsal.

MRI scan of the foot showed a cartilage capped bony outgrowth, arising from the distal 4<sup>th</sup> metatarsal along plantar as well as dorsal aspect and extending into the 4<sup>th</sup> web-space. The cortical continuity of the growth appeared to be intact, with an overlying cartilage thickness of 2 mm. There was no evidence of significant adjacent/overlying collection or any malignant changes. MRI features were suggestive of an Osteochondroma.

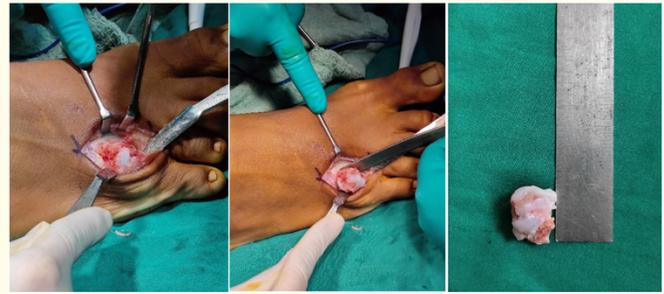


**Figure 3:** MRI Right foot with evidence of a hypo-intense lesion measuring 4\*3\*2 cm over the 4th metatarsal; extending along the plantar and dorsal aspect with a 2 mm of cartilaginous cap showing no malignant transformation. MRI Features were suggestive of an Osteochondroma.

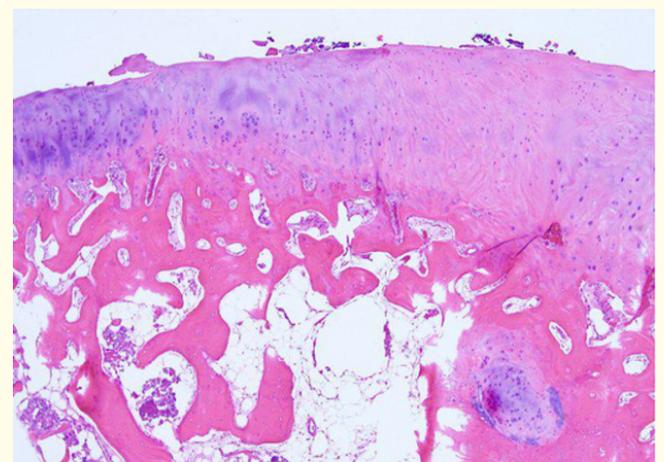
Patient was admitted and underwent pre-anaesthetic evaluation. He was posted for en bloc surgical excision under Spinal Anaesthesia.

An approximately 6-8 cm skin incision was taken over the dorsum of the foot, extending longitudinally between the 4<sup>th</sup> and 5<sup>th</sup> metatarsals. The neurovascular structures and tendons were identified and retracted, thereby exposing the tumour. The tumour was present in continuity with the shaft of the 4<sup>th</sup> metatarsal protruding into the 4<sup>th</sup> web-space (Figure 4). The mass was excised en bloc.

On histopathological examination the cartilaginous cap was found to be comprising of hyaline cartilage, with well-differentiated cells, parted by a profuse cartilaginous matrix. The features were characteristic of an osteochondroma (Figure 5).



**Figure 4:** Intraoperative images showing the bony mass, which was present in continuity with the shaft of the 4th metatarsal protruding in the 4th web-space. It was excised en bloc.



**Figure 5:** Microscopic picture with 10X resolution showed characteristic features of an osteochondroma.

### Discussion

Osteochondroma is hypothesised to be a benign chondrogenic lesion originating from anomalous cartilage [28]. The anomalous cartilage continues to grow till the age of skeletal maturity; following which growth of the osteochondroma stops. Osteochondromas of the foot are usually inoffensive but present early due to minimal subcutaneous tissue and soft tissue cover in the foot [4]. Osteochondromas appearing on the dorsum of the foot seldom cause any symptoms and are only of cosmetic concern to the patient or an hinderance while wearing footwear [29]. However, osteochon-

dromas on the plantar aspect of the foot usually present with pain on weight bearing and difficulty in walking [30]. Owing to the early presentation of osteochondroma in the foot, they are likely to be treated early, leaving negligible opportunity for malignant transformation. The diagnostic workup of an osteochondroma comprise of radiographs, CT scan to delineate bony extent, MRI scan to elucidate the nature of swelling and surrounding soft tissue changes. A radionuclide scan maybe rarely needed to exclude sarcomatous changes [31].

In this patient bony mass was big enough to cause a scalloping effect due to increased local mechanical pressure over the 4th metatarsal. MRI scan helped to delineate the cartilaginous cap of the tumour. We got an MRI done to rule out any sarcomatous changes. Only after confirming the benign nature of the tumour, en bloc excision of the osteochondroma was performed.

In the current reporting case of osteochondroma of the 4th metatarsal in a 16-year-old male patient, the primary complains presented were that of a painful swelling, insidiously increasing in size. We hypothesize that the origin of the pain could be due to the local scalloping effect of the osteochondroma over the adjacent tissue and bone. Due to the pressure and mechanical effect of the osteochondroma on the surrounding tissue, the soft tissue and ligaments in the 4<sup>th</sup> web-space were stretched causing painful supination and pronation of the foot. This case represents the occurrence of osteochondroma in the foot as an unusual aetiology of painful bony swelling in young age. Biopsy should be done in suspicious cases, though it was not done in this case as the MRI did not show any findings indicative of any malignant transformation. Overall, complications associated with surgical excision of osteochondroma are low, and lead to substantial long-term comfort after careful en bloc excision. Excision of osteochondroma is usually curative [3]. However, recurrence may be seen when the removal is incomplete. Multiple recurrences or recurrences in a well excised lesion should raise the suspicion of malignancy.

## Conclusion

Even though osteochondromas are generally managed conservatively due to their inoffensive nature, an en bloc surgical excision is the treatment of choice for those arising in the foot, to provide symptomatic relief. The osteochondroma in the metatarsal is rare, but should be kept in mind as an unusual aetiology of a painful foot

even in the young age group. The scalloping and pressure effect on the adjacent soft tissues and bone can cause pain due to the underlying osteochondroma which are completely relieved once the tumour is excised.

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