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Enchondroma of Proximal Phalanx of the foot – A Case report

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Abstract

Enchondromas are benign latent cartilaginous tumours composed of hyaline cartilage that typically occurs in medullary cavity of short bones. They usually present within the age group of 20-50 years with male to female ratio of 1:1. Herewith we report a unique case of 30 years old gentleman who presented with the complaints of pain and swelling over the left foot 3rd toe for the past 3 weeks. He was evaluated with plain radiograph of the foot, which showed osteolytic lesion over the 3rd proximal phalanx and thinning of cortex. Subsequently he was managed surgically with curettage and grafting using hydroxyapatite granules and stabilised with K wire. Intra operatively, whitish jelly-like substance was noted which was curetted and sent for histopathological examination(HPE). HPE report showed features suggestive of enchondroma. At 8 weeks follow up, K wire was removed and started on full weight bearing walking. At the end of 3rd month follow up patient was free of symptoms and radiologically there was a complete incorporation of synthetic bone graft and no sign of recurrence.

Conclusion: Symptomatic Enchondroma should be considered for surgical management. In this case report the unusual occurrence of enchondroma of foot in proximal phalanx and its clinical and radiological outcome after surgical intervention were discussed.

Keywords: Osteolytic lesion, Benign tumours, K wire, Hydroxyapatite granules, Enchondroma

Introduction

Enchondromas are second most common benign cartilaginous tumours composed of hyaline cartilage. They are most frequently found in the metaphyseal area, most likely because of their growth plate origin. They may also arise from diaphysis. They are infrequently observed in the epiphysis, and chondroblastoma is more likely than enchondroma to be present in the epiphysis as a cartilaginous lesion(1). Patients typically present between 20-50 years of age with an asymptomatic lesion, discovered incidentally on radiographs. Diagnosis is made radiologically with the presence of a well-defined, lucent, central medullary lesion that is around 1-10 cms. Pathophysiology is that enchondromas represent incomplete endochondral ossification in which chondroblasts and fragments of epiphyseal cartilage escape from the physis, displace into the metaphysis and proliferate there. The cortical bone around them thins as they grow, which puts stress on the bones and increases the risk of fracture. There are five different forms of enchondromas, each with a different frequency which are central (58%), eccentric (19%), mixed (21%), polycentric (11%), and giant(3%)(2).It is more common in hand than foot. Even though only around 6% of all enchondromas found in the foot, when they do, they are most commonly located in the foot's phalanges and metatarsals. Here we report a case of enchondroma of the foot and its management.

Case report:

A 30 years old gentleman presented with complaints of pain and swelling over the left foot 3rd toe for a duration of 3 weeks. Over the time, pain worsened leading to restricted range of movements.

On clinical examination of the left foot 3rd toe, swelling of size 3x2 cms was present over the proximal phalanx with no scars or sinus and visible pulsations. On palpation the swelling had no warmth, smooth surface with irregular border and was not fixed to the skin. Tenderness was elicited. Plantar flexion of 3rd toe was terminally painful.

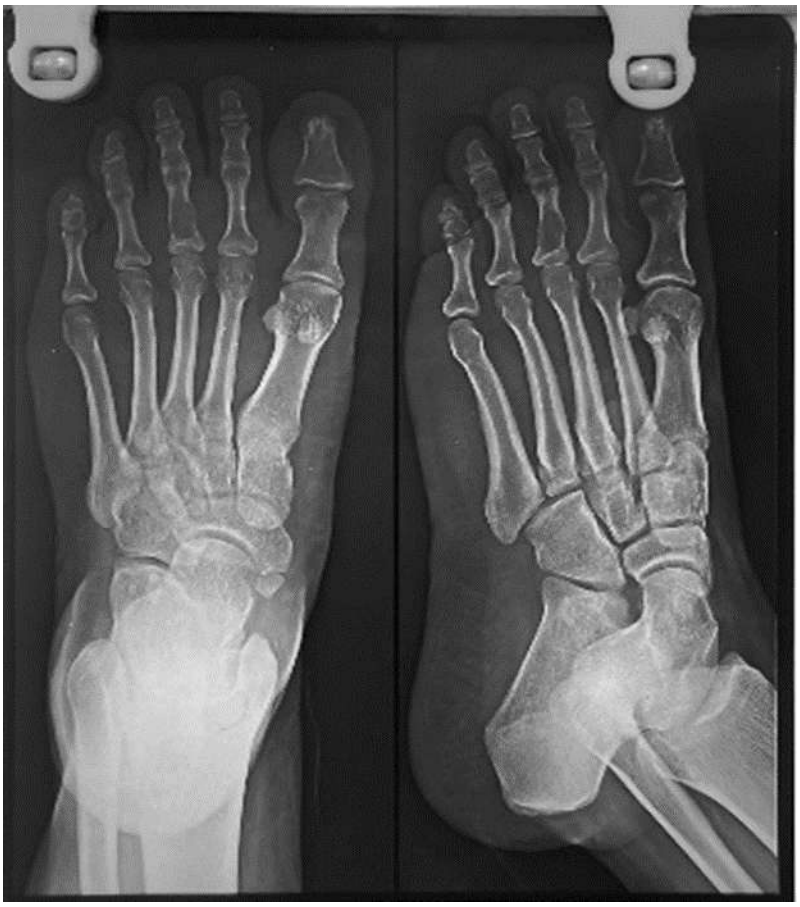
Plain radiograph of the left foot anteroposterior and oblique view was taken which showed osteolytic lesion of the 3rd proximal phalanx with possible differentials such as :

1.? Enchondroma/ 2. ? Browns tumour/ 3. ? sub acute osteomyeleitis / 4. ? Tendon sheath GCT/

5.? GCT Variants

As it seemed to be a benign lesion, we planned to perform curettage.

Figure 1: Preoperative x ray showing osteolytic lesion



Management:

Blood investigations were done and showed normal parametres. We proceeded with Curettage + synthetic bone grafting (hydroxyapatite granules) + k wire fixation. Intra operatively whitish jelly like substance was found in 3rd proximal phalanx which was curetted and sent for histopathological examination.

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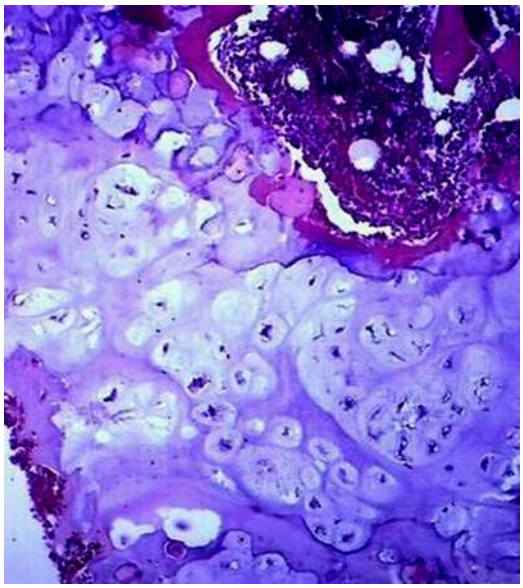
Figure 2: Intraoperative image after curettage and synthetic bone grafting

Histopathological findings:

The histopathological examination showed fragments of tumour composed of lobules of benign hyaline cartilage which are partly encased by the trabecular bone with features suggestive of enchondroma confirming the clinical diagnosis. Image shows lobules of cartilage encased by trabecular bone.

Figure 3: Histopathology showing lobules of hyaline cartilage encased by trabecular bone



Follow up:

Post operative period was uneventful. Pain reduced significantly post operatively. Regular dressing was done. Wound healed without any signs of infection. He was encouraged on non-weight bearing mobilisation for 2 months and then he was started on full weight bearing. Post operative follow up at three months duration showed good graft integration uptake with no recurrence.

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Figure 4: Clinical image showing complete wound healing

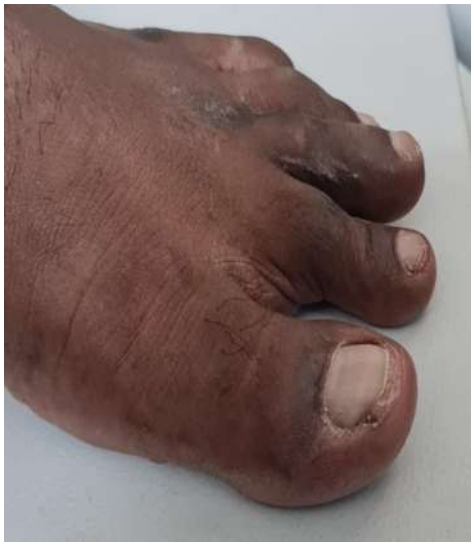
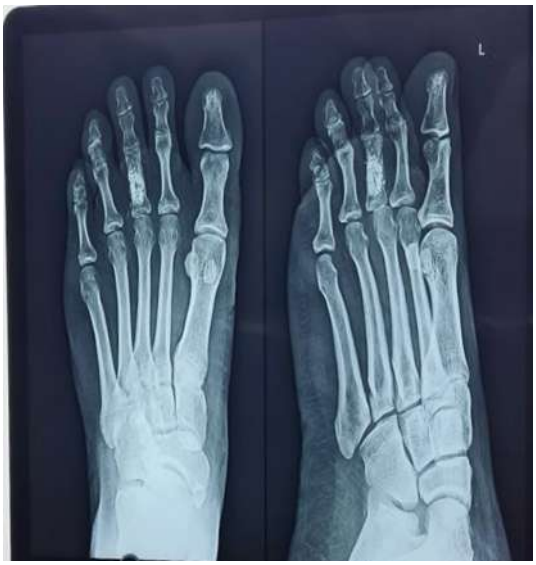


Figure 5: Post operative x ray with complete integration of synthetic bone graft



Discussion:

Enchondromas are benign, intramedullary neoplasms of the hyaline cartilage and are relatively common lesions, accounting for about 10% of benign osseous tumors. Approximately one half of these cases will be found in the small bones of the hands or feet. Although only about 6% of all enchondromas develop in the foot, when present, they will most frequently be found in the phalanges and metatarsals of the foot[3].

Gajewsk et al [4] reported that 47% of enchondromas in the foot were located in the proximal phalanx. Enchondromas can present as a solitary lesion or multiple lesions, such as those that occur in multiple enchondromatosis (Ollier's disease). Maffucci syndrome is another disease associated with multiple enchondromatosis and is often accompanied by soft tissue hemangioma. They also described enchondromas had distinct borders as contrary to the hazy boundary of the malignant lesions, and they lacked the cortical thickening, bone growth, and soft-tissue mass that were typical of chondrosarcomas.

When enchondromas become symptomatic, the most common chief complaint will be pain owing to the increased pressure secondary to an expansion of the lesion with thinning of the bony cortex. Some patients

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can also present with a history of gradual enlargement of the digit. Other causes of pain include pathological or stress fracture of the lesion, with or without a history of trauma or due to strenuous physical activity, and malignant conversion of the tumor[5].

Bicket et al in his study gave the idea of using cemented intramedullary hardware after the removal and curettage of lesion. 13 patients were included in the study, all of them showed good mechanical stability and functional outcome by this technique. Though 7 patients showed limited flexion at metacarpophalangeal joint and interphalangeal joint later date[6] .

Histologically, enchondromas were defined as lesions with cellularity greater than resting articular cartilage, tiny nuclei, homogeneous nucleoli, and an abundance of cytoplasm. Although there may have been a few binucleate lacunae, mitotic activity was either negligible or rarely seen. Histologically, chondrosarcoma was classified into three classes. The infiltration and entrapment of normal trabecular bone was probably the most significant difference between chondrosarcoma and enchondroma[7].

After pathologic fracture, Sassoon et al [8] reported no differences in the outcomes when the enchondromas were treated primarily or after fracture healing, Because the changes in bone quality caused by untreated lesions tends to continuous pain or pathologic fractures, it has been recommended that symptomatic enchondromas should be removed.

The type of grafting material selected has no impact on the length of immobilization, the rate of post surgical complications, the time to full recovery, or post surgical functional results in cases with enchondroma. Surgery takes less time when hydroxyapatite bone replacements are used in granules rather than autogenous bone grafting. The use of autogenous bone transplantation could make tumour recurrence more likely[9].

Conclusion:

Symptomatic enchondroma in any region with pain and affecting patients daily chores should be considered for surgical intervention. Enchondromas are generally asymptomatic incidental radiographic findings, yet can be symptomatic when there is stress fracture of the surrounding cortical bone. Resection of the enchondroma along with augmentation of bone graft or bone substitute can provide excellent and reliable long-term outcomes. This case is reported for its presentation in rare site, usage of bone substitute and its functional outcome.

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