Osteochondroma Of First Metacarpal, At Unusual Location- A Rare Case Report

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Abstract: Osteochondroma is more frequent in long bones than in smaller bones. The metaphysis of the proximal tibia, distal femur, distal fibula, proximal femur, & proximal humerus are all common positions. The metacarpals are seldom impacted. This case report is about a 33-year-old female patient who developed sudden, sharp shooting pain in 1st Metacarpal since 22 days. The pathology report suggested Osteochondroma of bone. The patient underwent surgery with open reduction & internal fixation with plate osteosynthesis for 1sy metacarpal fracture in the left side. Patient was discharged after been given the antibiotics & implant fixation.

Keywords: Osteochondroma, First Metacarpal, osteosynthesis, Metaphysis, proximal bones

Introduction

Osteochondroma constitutes one of the most frequent benign bone tumours.[1] Hand osteochondroma is rare, accounting for just 4% of all single occurrences. It generally appears around the second or third decades of life. It typically develops away from the developing end of the bone unless the patient reaches bone maturity. several hereditary exostoses are those that appear at several places. Osteochondromas can appear as a single tumour (osteocartilaginous exostosis) or as many tumours (multiple osteochondromatoses).[2] A single osteochondroma can form if bone develops beyond the growth plate rather than in line with it. The majority of bony exostoses are asymptomatic till they expand & squeeze neurovascular bundles or surrounding critical organs. Osteochondromas primarily affect the skeleton of the appendages (upper & lower limbs). In most cases, removal of the osteochondroma is curative. Recurrence has been observed in situations of incomplete removal, which refers to the cartilaginous cap not being removed completely. These bony outgrowths can aggressively develop into cancerous tumours.[3]

Case presentation

A 33-year-old female patient reported to the Department of Orthopaedics, Datta Meghe Institute of Higher Research & Education on 11/07/2024. The patient had a chief complaint of pain & swelling over the 1st metacarpal left side since 22 days (mode of injury-non traumatic). The patient was apparently alright before the symptoms developed. The sudden pain & deformity was seen over 1st metacarpal bone on the trivial pressure while sitting comfortably. The pain was acute on onset, sharp & shooting in type, non-progressive, associated with history of weight loss since 1 month. The patient went to local private practitioner where she was treated conservatively. No associated illness like TB, HTN, Asthma & DM were noted, with no significant past & family history. The patient was conscious & oriented, during the abdominal examination, the findings were soft & non-tender.

During the local examination of the left hand, it was seen that there was swelling present over 1st metacarpal region, with no scar, sinus & no dilated vein.

The provisional diagnosis was given as: swelling under evaluation over 1st metacarpal bone left side. The specimen (bone tissue) was sent to for the Histopathology in a single contained labelled as bone tissue dated 20/07/2024. The laboratory received multiple, irregular, whitish tissue bits aggregating 2x1.5x0.5cm. Section from given tissue piece showed /histopathological features suggestive of Osteochondroma of bone, & no evidence of osteomyelitis of tuberculosis was noticed in the given specimen.

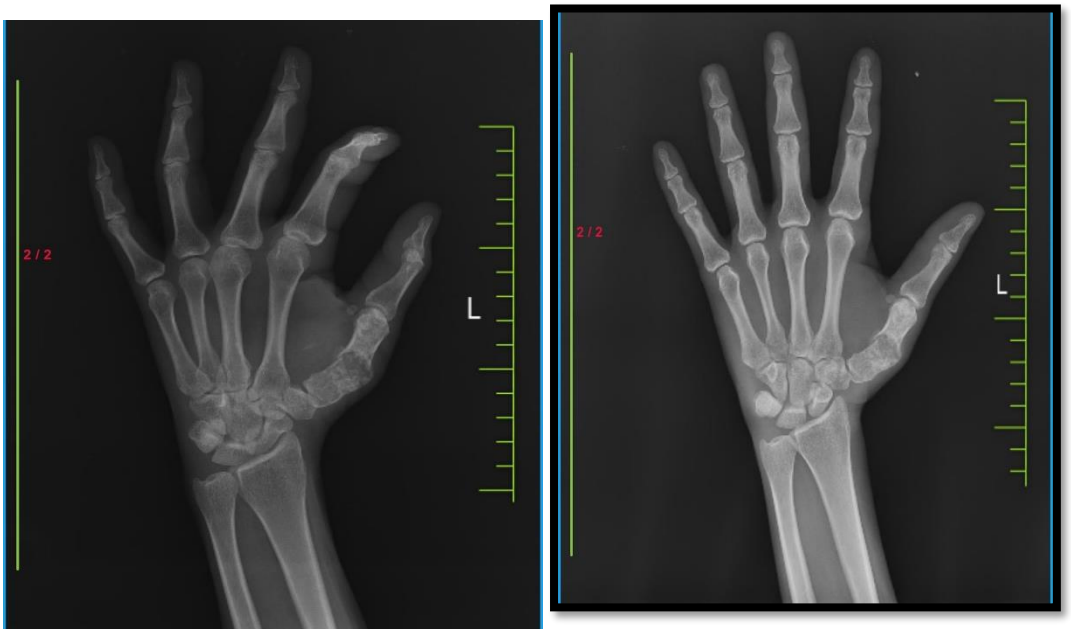

Figure 1 a & b: Pre-operative radiographs (AP & Lateral)

Surgical procedure:

The time duration of the surgery was 2 hours & 25 minutes, with cleaning done with Betascrub+Savlon+Sterilium. Draping was standard 3 layered, approach was Dorso-Lateral.

Patient was taken supine on OT table under axillary & supraclavicular block was given. Under all the septic precautions- cleaning, painting & draping of the left upper limb was done. Approximately 6-7 cm straight longitudinal skin incision was taken over the dorso-lateral aspect of the thumb just lateral to extensor tendons of the thumb was done (not directly over the extensor tendons). Soft tissue dissection was undertaken & Extensor pollisis longus, Extensor pollisis brevis tendon & surrounding loose connective tissue were retracted. Inter-tendinous connections was incised for full exposure of the distal diaphysis & metaphysis was done. Later Dorsal Interosseous muscles were retracted. Osteolytic bone defect was visualized & confirmed under C-arm guidance. Caseous material was seen, extensive curettage was done & sent for histopathology, culture & Z-N staining. Approximately 4 cm incision was taken over highest point of the left iliac crest. Chip of bone graft (cortico-cancellous) was taken from the same. Osteolytic defect was filled with bone graft, G bone & streptomycin powder. The fracture site was reduced & fixed with 8-hole recon (metacarpal) plate with 3 Phillips screws proximal & 3 Phillips screws distal to the fracture site.

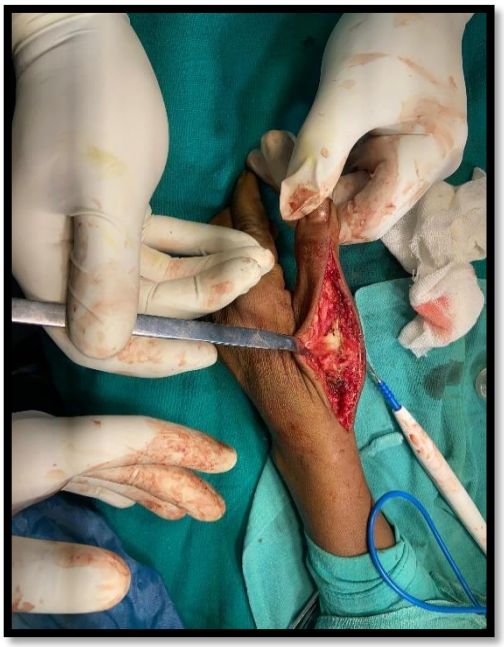

Figure 2: Incision cut given

The reduction was confirmed under C-arm & was found to be satisfactory. Inter-tendinous connections were repaired. The closure were done in layers (Subcuticular) using Ethilon 3-0 sutures, followed by Sterile dressing, radial pulse was palpable. SPO_2 in all the fingers-97.99% was observed. Later Radial gutter slab was given. The patient was shifted to Orthopaedic recovery for observation. No complications were reported, & the procedure was uneventful.

Figure 3: Sample of the specimen collected

The implant used were:- a) mini plate 8-hole (Metacarpal)-1, b) Screw mini (Phillips)- 2.5x12 (3) , 2.5x 14 (3) & G bone granules.

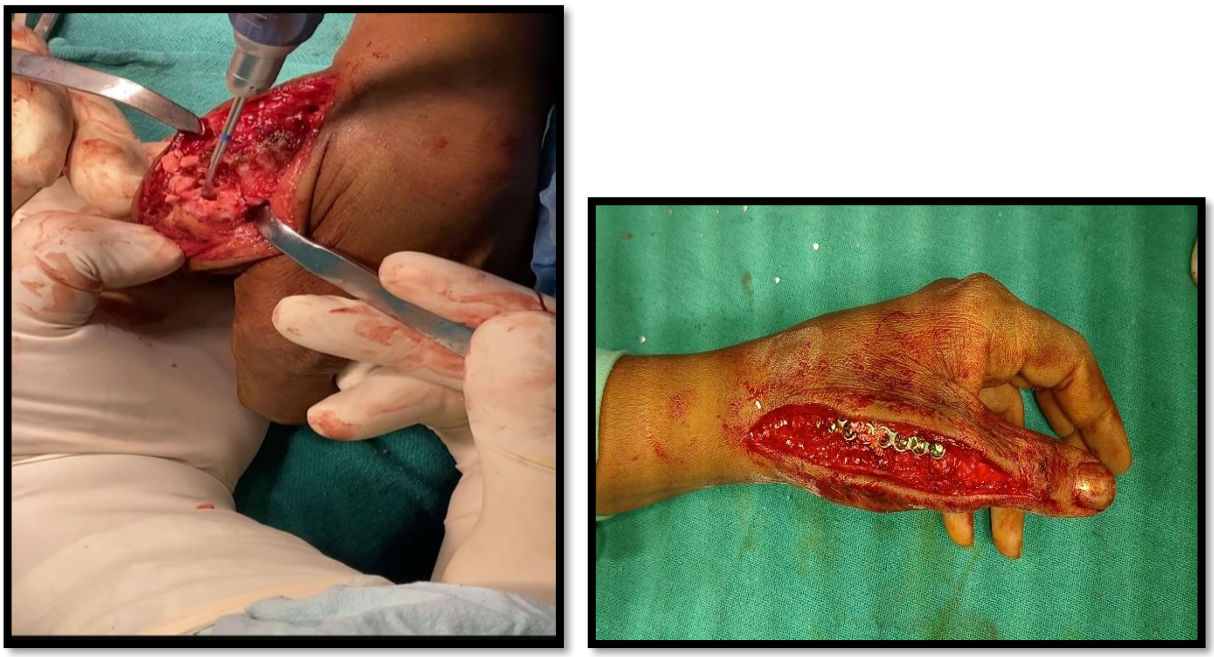

Figure 4-a: Drilling procedure, b- Mini plates & screw placement

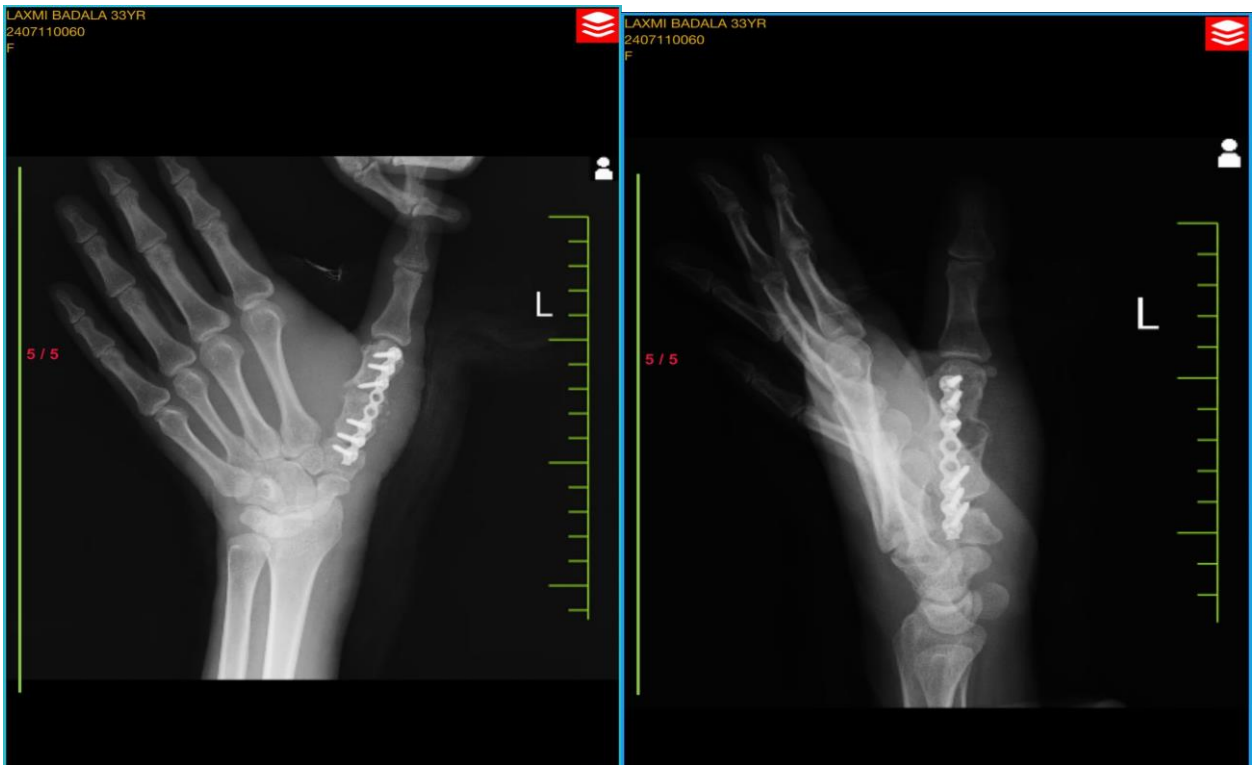

Figure 5 a and b: Post- operative Radiographic check taken after day 1.

Post operative instructions

- For 6 hours or till further orders for nothing by mouth.
- I/V fluids: 2 units normal saline at 100 ML/Hr, 2 units ringer lactate at 100 ML/Hr.
- Drugs: Inj. Pantoprazole 40 mg IV 24 hourly, Tab. Pantoprazole 40 mg oral 24 hourly, Inj. Lomoh 60 IU Iv 24 hourly at 10 PMx3 days, Inj. Emeset 4 mg IV SOS.
- Antibiotic: Inj. Ceftriaxone & Sulbactam 1.5 gm IV twice daily, Inj. Clindamycin 600 mg IV BD, Inj. Streptomycin 1000 mg OD IM.
- Analgesic: Inj. Paracetamol 2 ML in 100 ML NS twice daily.
- Other medications: After NBM release Tab Chymoral Forte 1 Tab Thrice daily, Tab Limcee 500 MG thrice daily.
- Limb position: Elevated
- Bed position: Supine

Temperature, Pulse, Respiratory rate & I.O Charting was noted at every 4 hours.

Follow up

Sterile dressing was done post operative 1st & 2nd day. Below elbow slab radial gutter slab was given for 8 days of post op & sterile dressing was done again on post op day 7 (a week later) with T Bact (Mupirocin) ointment. On post op day 12seen,ures were healthy & no wound gaping was seen & suture removal was done. Thumb spica was given for 4 weeks following the suture removal.

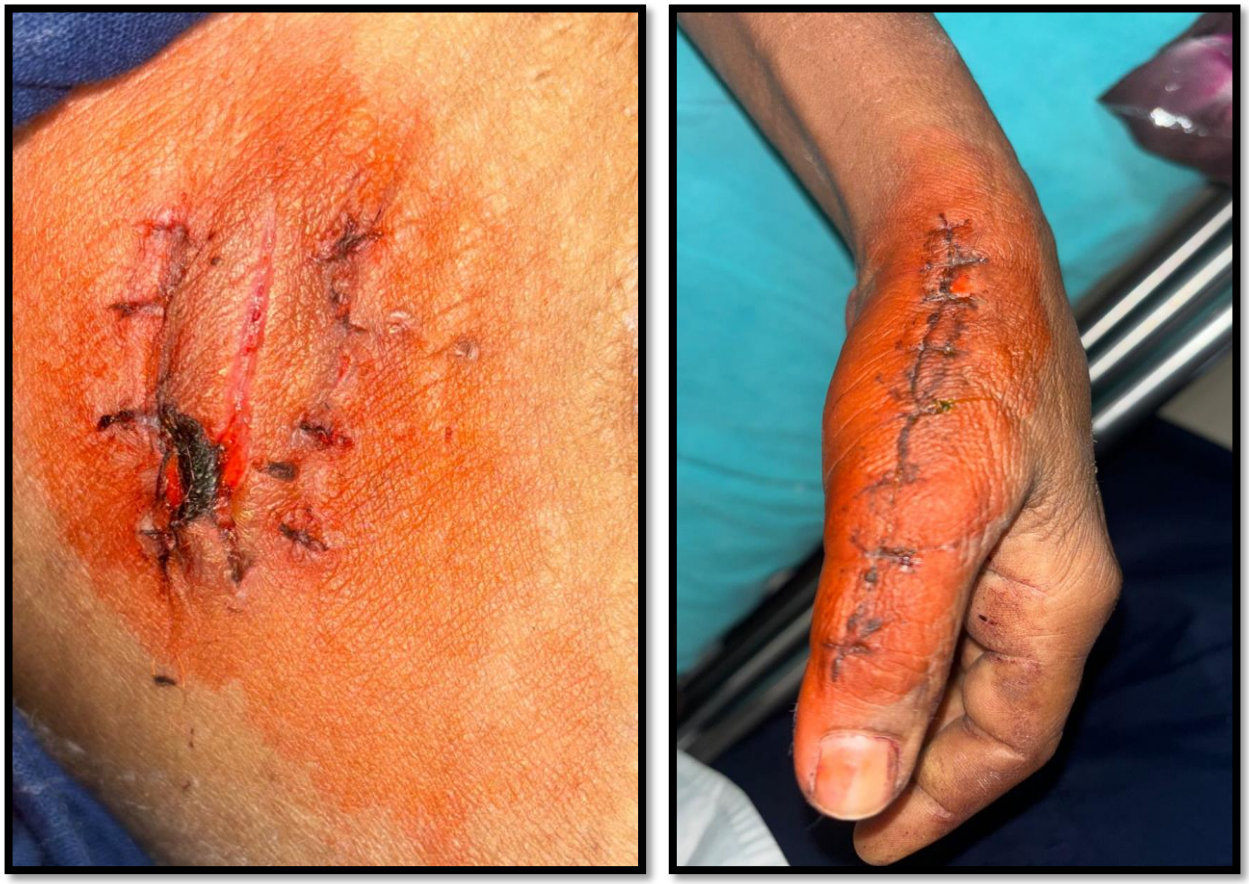

Figure 6 a- Post operative day 12, b- Graft site post operative day 12

Figure 7: Post operative 10th day, given thumb brace

DISCUSSION

Osteochondroma are frequently asymptomatic & discovered by chance. The clinical picture shows a painless, non-tender lump/mass. Osteochondroma affects the epiphysis of a long bone in individuals with

open physeal cartilage.[4] They are considered developmental malformations rather than real neoplasms & are assumed to have started in the periosteum.[5] It can alternatively be characterised as an osseous tumour with a cartilage cap that protrudes from the diseased bone's surface. Exostosis is caused by the gradual endochondral ossification of the hyaline cartilaginous cap, that primarily serves as a growth plate. Osteochondroma is most usually seen at the metaphysis of the proximal tibia, distal femur, distal fibula, proximal femur, & proximal humerus. [6]

According to one investigation, only four of 1024 single osteochondromas were found in the metacarpal region.[7] A single osteochondroma of the metacarpal neck, resulting in flexion deformity of the metacarpophalangeal joint, was treated by excision.[8] Kishore et al. described an unusual incidence of osteochondroma in the craniofacial region, namely the left parasymphyseal portion of the jaw in a 9-year-old female kid.[9]

Bhatnagar et al. described a rare clinical & radiologic discovery of a patellar osteochondroma in a 50-year-old female, which was surgically removed & followed up for two years, confirming no complaints & no signs of recurrence.[10]

Other unusual places where osteochondroma has been observed recorded include the patella, mandible, & scapula. [3] A case report by Rajappa et al. indicates recurrence of osteochondroma of the metacarpals following resection.[11] Mnif H et al described an uncommon example of metacarpal osteochondroma with a lack of extension. The diagnosis was determined utilising imaging methods & confirmed with a histology investigation. The therapy is surgical, namely total excision.[12] In a report Herget GW et al, suggested that the probability of malignant transformation of a single osteochondroma is normally modest. Axial lesions, recurring osteochondromas, & numerous osteochondromas appear to have a higher chance of malignant development. The follow-up, which necessitates adequate primary diagnoses, involves frequent self-control & can typically be clinically performed in more peripherally placed lesions, but in certain cases, supplemental X-ray imaging is required. In circumstances when anatomical areas are impossible to access manually, MRI is the preferred form of follow-up assessment. Long-term follow-up appears to be particularly beneficial for MO patients: when the tumour is situated in the trunk & (proximal) long bones, MRI or whole-body MRI, respectively, must be conducted once a year after skeletal maturity due to the increased risk of malignant transformation in these patients.[13]

Altay M et al concluded that Cartilage-forming benign bone tumours are more likely to become malignant. Although the malignant development of a benign bone tumour is uncommon, orthopaedic surgeons should be cautious when managing patients with a benign bone neoplasm. Early detection & adequate surgical therapy are necessary to get positive results. The local recurrence rate in secondary chondrosarcomas is determined not only by appropriate surgical therapy, but also by localisation & histological grade.[14] It was highlighted by Woertler K et al, that malignant transformation is the most concerning consequence, occurring in around 1% of solitary as well as 5-25% of numerous osteochondromas. Magnetic resonance imaging is the most reliable approach for determining cartilage cap thickness, which is an essential criteria for distinguishing between osteochondromas & exostotic (low-grade) chondrosarcoma. Cartilage cap thickness greater than 2 cm in adults & 3 cm in youngsters should arouse the suspicion of malignant transformation. Finally, MR imaging can identify postoperative recurrence by depicting a recurring mass with the morphological characteristics of a cartilage-forming lesion.[15] Florez B et al, highlighted that relapse of exostosis is uncommon, occurring in just around 2% of resections. The development of an osteochondroma and/or the presence of discomfort in elderly persons indicate the possibility of cancer.[16]

Zheng L et al in their cases saw that the tumours were clearly lobulated, & they invaded the soft tissue. The sarcomatoid component was a peripheral, well-differentiated chondrosarcoma. The p53 mutation may explain some of the molecular mechanisms involved in malignant transformation.[17] A study done by Tong K et al, the results showed that the males were younger than females when they were first diagnosed with OC, as were MO patients compared to SO patients. Furthermore, MO had a greater rate of local recurrence. The intervals between first surgery & local recurrence or malignant change were greater in MO patients than in SO individuals.[18] In a different study, it was seen that a radiological examination revealed a calcified tumour on the second row of carpal bones, which was spherical in form & coated with cartilage. He underwent surgery to remove a cartilaginous tumour originating from the capitate. Pathology indicated the presence of an osteochondroma.[19,20]

Our case reported the occurrence of Osteochondroma on the 1st metacarpal dorso-lateral side. The lesion was extra-articular & could be entirely removed, therefore, lowering the likelihood of recurrence.

CONCLUSION

Although uncommon, osteochondromas can develop in the h& & should be investigated with clinical & radiological concern. Osteochondromas can occasionally form in odd locations, such as tiny bones in the h& & foot. As a result, osteochondroma must be regarded a differential diagnosis with other frequent h& & foot tumours, such as enchondroma (Olliers disease).When a patient has pressure-related signs & symptoms, excision is needed conducted. Histopathological confirmation is required following full excision. The patient should be counselled about the tumour’s recurrence.

DECLARATION OF THE COMPETING INTEREST

The authors report no declarations of interest.

FUNDING

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ETHICAL APPROVAL

Ethics approval has been obtained to proceed with the current study. Consent to participate not applicable.

CONSENT

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

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