CASE REPORT

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# Capitate Osteochondroma: A Case Report

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## Abstract

We report a case of Osteochondroma of the Capitate. A 58-year-old man had a one-year history of pain and swelling over the dorsum of Left wrist. At surgery we found a marble white, lobulated structure overlying the capitate bone. The patient became symptom free after the lesion was excised.

**Keywords:** Carpal bone, Capitate, Capitate Osteochondroma, Swelling, Wrist

## Introduction

Most osteochondromas arise from the metaphyseal surfaces of long bones. Solitary osteochondroma of the carpus are extremely rare with 21 reported cases of osteochondroma arising from the carpal bones done in a literature review up to 2005, with scaphoid being the commonest site in the series and only a handful of new cases for specific carpal bones are reported in some reviews.

## Case Report

A 58-year-old right hand dominant male came to the outpatient clinic with history of dull aching, non-radiating, on and off pain over his left wrist for 1 year. He denied any history of trauma one year back however stated a fall injury with impact over the wrist five days prior to his visit. There were no history of constitutional symptoms and his activity of daily living was as usual.

On examination of the wrist, it revealed a swelling about 3x3 $cm^2$ over the dorsum along the distal wrist crease overlying the carpus which was hard, non-mobile, had no superficial skin changes, no pulsations and was tender to touch. Associated range of motion during dorsiflexion was painful at around five degrees with about 60 degrees of palmar flexion without pain. The contralateral wrist had 80 degrees of active flexion and extension.

Plain radiographs demonstrated a bony growth over the carpus overlying the capito-lunate area. This was followed by CT evaluation which revealed displaced fracture of the dorsal aspect of the capitate bone measuring 5.9 x 5.2 $mm^2$ with thin area of ossification circumferentially surrounding the displaced fragment along with adjacent soft tissue thickening, initially reported as heterotrophic ossification. MRI was then performed which showed Diffuse STIR high signal intensity suggestive of edematous changes in the subcutaneous plane and T1 and T2 low signal intensity fragment in the left wrist joint dorsal to the capitate and lunate bone suggesting possible fracture fragment.

With these, the patient was planned for exploration and excisional biopsy of the loose fragment. A dorsal wrist approach was done and a transverse sharp incision given overlying the swelling. Overlying Extensor tendons were found to be intact, they were retracted and a dorsal capsulotomy done. A marble-white, sessile, lobulate, isolated mass about 2 x 2 $cm^2$ was

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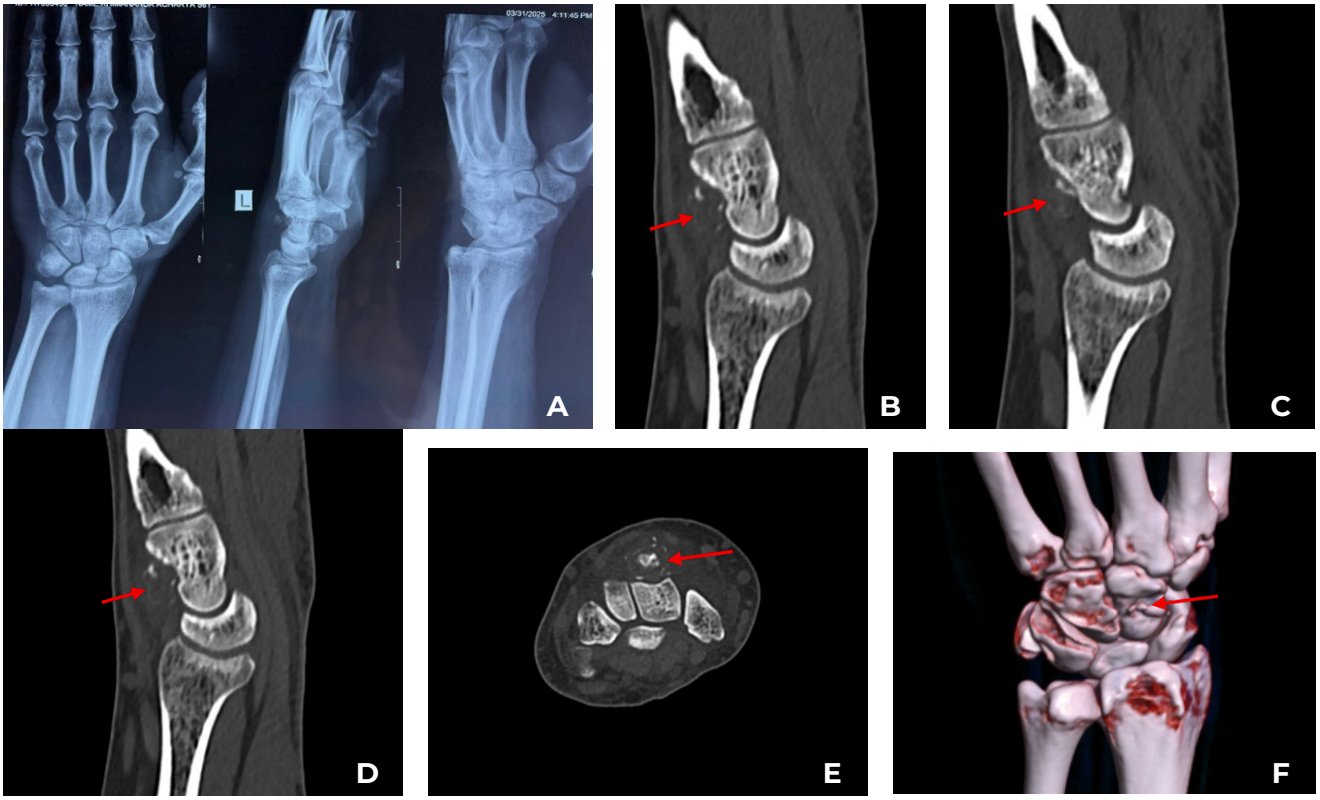



**Figure 1** A. Xray Left wrist B-F. CT of Left wrist B-D: Sagittal section in continuity; E: Axial Section ; F: 3D image

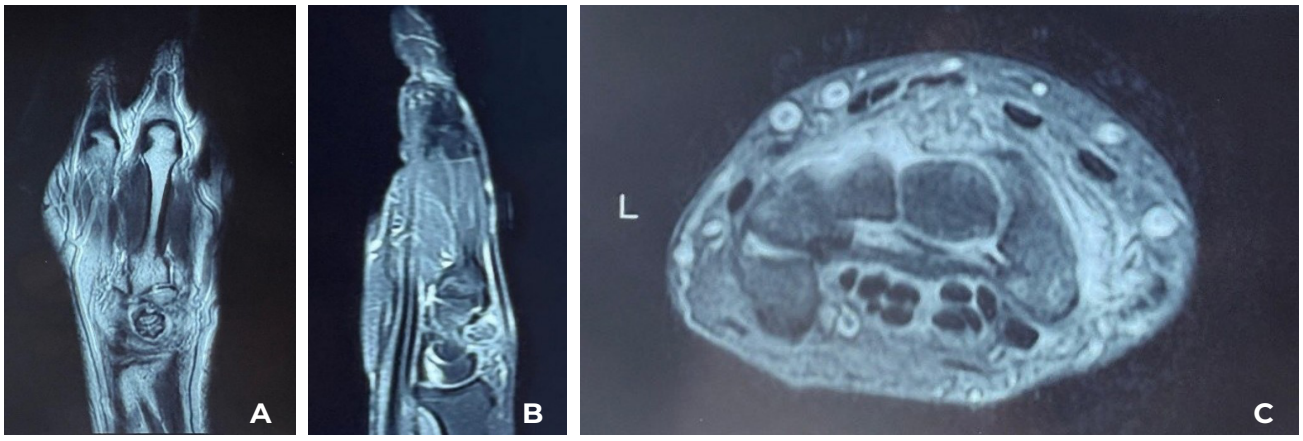



**Figure 2** MRI images A: Coronal section, B: Sagittal section, C: Axial section



**Figure 4** Intraoperative excision of mass

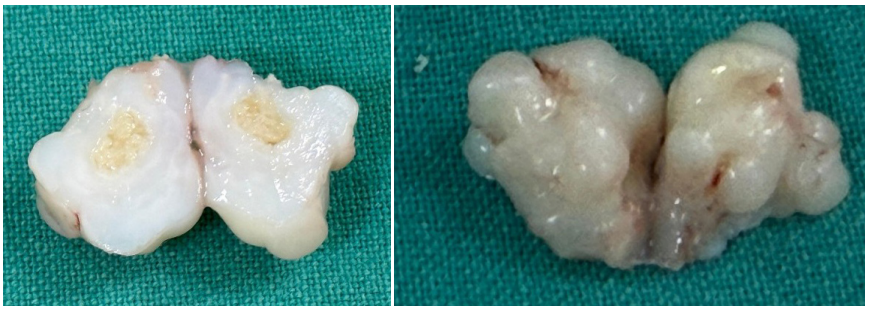


**Figure 5** Specimen Gross Examination

removed dorsal to the capitate. On table dissection of the mass revealed an outer white layer with inner core of yellow material. Joint cavity were thoroughly explored. The mass was sent for Histopathological evaluation which revealed cartilaginous cap and underlying mature bone trabeculae suggestive of Osteochondroma.

On subsequent follow-up the patient noted improvement in his symptoms at three weeks post-surgery. On six weeks post-surgery, the patient had noted comfortable return of activities.

## Discussion

Osteochondroma is the most common benign bone tumor; however, involvement of the carpal bones is exceptionally rare. While these tumors typically arise from the metaphysis of long bones, only isolated cases involving the carpus have been reported, most commonly affecting the scaphoid and, less frequently, the capitate, hamate, trapezium, and lunate. The rarity of carpal osteochondromas is attributed to the unique developmental anatomy of the carpal bones and the absence of a conventional metaphyseal growth plate. Capitate osteochondroma, first described by Malhotra et al. in 1992, remains an exceedingly uncommon entity, with only a handful of cases reported in the literature.[1,4]

Patients with capitate osteochondroma typically present with a slowly enlarging, painless wrist swelling; however, pain, limitation of wrist motion, cosmetic concerns, and mechanical symptoms may also occur depending on the size and location of the lesion. Due to the confined anatomy of the wrist, even small lesions may cause tendon irritation or neurovascular compression. Shah et al. reported attritional rupture of the extensor digiti minimi tendon secondary to a dorsal capitate osteochondroma, while Takagi et al. described median nerve compression caused by a lunate osteochondroma. Similarly, Motomiya et al. reported an atypical hamate osteochondroma presenting as carpal tunnel syndrome. In contrast, our patient had no evidence of tendon involvement or neurovascular compromise despite the presence of a symptomatic capitate lesion.[3,5,6]

Plain radiographs remain the initial imaging modality; however, the overlapping anatomy of the carpus often limits accurate localization. Computed tomography is particularly valuable in demonstrating corticomedullary continuity and defining the precise origin and extent of the lesion, while magnetic resonance imaging helps assess the cartilage cap and adjacent soft tissues. Histopathological examination remains the gold standard for confirming the diagnosis by demonstrating mature trabecular bone covered by a hyaline cartilage cap with endochondral ossification.[2,4] Interestingly, in our case the radiological reports varied with the intraoperative findings along with the histopathology reports. Diagnosing rare tumors of the carpus remains challenging because they often present with nonspecific clinical and radiological features. In our case, the uncommon location of the lesion and a clinical history favoring a more common pathology may have contributed to the initial imaging interpretation, highlighting the need for a high index of suspicion and close Clinico-radiological correlation when evaluating atypical wrist lesions.

The differential diagnosis includes bizarre parosteal osteochondromatous proliferation (Nora lesion), parosteal chondroma, periosteal chondroma, osteophytes, dysplasia epiphysealis hemimelica, and low-grade chondrosarcoma. The presence of corticomedullary continuity between the lesion and the parent bone is the characteristic feature distinguishing osteochondroma from these conditions.[4,7]

Management principles are similar to those of osteochondromas occurring elsewhere in the skeleton. Observation may be appropriate for asymptomatic solitary lesions, whereas surgical excision is recommended for symptomatic lesions causing pain, functional limitation, progressive enlargement, tendon irritation, neurovascular compression, or diagnostic uncertainty. Complete excision of the cartilage cap and osseous base minimizes recurrence and has consistently resulted in excellent functional outcomes in the reported cases of capitate osteochondroma. Although malignant transformation of solitary osteochondroma is rare, continued growth after skeletal maturity or increasing pain should prompt further evaluation.[4,7,8]

Our case further expands the limited literature on capitate osteochondroma by demonstrating successful diagnosis and management with complete surgical excision and favorable clinical outcome. Given its rarity, capitate osteochondroma should remain an important differential diagnosis for patients presenting with a localized osseous wrist mass, and appropriate cross-sectional imaging combined with histopathological confirmation is essential for accurate diagnosis and optimal treatment.

**Patient consent:**

The patient provided written informed consent for publication of this case and accompanying details.

**Conflict of Interest:** None
**Acknowledgement:** None
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