

## Giant Cell Tumour of Metacarpal an Illustrative Case Report

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**Abstract:** Giant cell tumours of the metacarpal are very rare. This paper presents a case of a 28 year old male who presented with complaints of pain and swelling over the left hand over a period of six months.. Clinically a diffuse swelling of 4x2 cm in size over the dorsal aspect of the second metacarpal base of the left hand was observed. An X-ray showed lytic lesion with multiple cysts over the base of second metacarpal. The tumour was managed by marginal excision and reconstruction of bone defect.

**Keywords:** Giant Cell Tumor, Metacarpal

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### I. Introduction

Giant cell tumour is a benign, locally aggressive bone neoplasm which is relatively rare and affects young adults. Giant cell tumour first identified in 1818 although it was not until 1940 that the disease was distinguished from other bone diseases such as chondroblastoma, non-ossifying fibroma etc<sup>(1)</sup>. Giant cell tumours show a distinct amount of bone loss and occasional metastasis; most commonly to the lung<sup>(2)</sup>. Giant cell tumours of the hand and feet are rare and the incidence rates are 1.7% and 1.3% for hand and foot respectively<sup>(3)</sup>. These giant cell tumours although extremely rare are aggressive in nature and have a predominance of occurrence in the younger population. A slight female predilection has also been suggested<sup>(4)</sup>.

### II. Literature Review

The study by Saikia et al <sup>(5)</sup> where one patient was treated with ray amputation while the other underwent wide resection and tricortical iliac crest bone grafting. Another study has shown on 3 patients that curettage, cryosurgery and cementation is effective in treating this aggressive tumour. This method reduces the need for amputation, reduces the morbidity associated with movement disability and minimal complications.<sup>(6)</sup> A study conducted on four cases with metacarpal giant cell tumour were treated with resection of tumour with reconstruction of which one was treated with ray amputation<sup>(7)</sup>. A case study that reported a giant cell tumour in the fourth metacarpal was treated by resection of the metacarpal bone, with partial excision of the surrounding muscle and reconstruction<sup>(4)</sup>.

It can be therefore be derived from the literature that various methods of management can be used for the management of the rare occurrence of a giant cell tumour in metacarpals. The modalities of management include curettage, cementation, resection, bone reconstruction, ray amputation and excision. In this study, marginal excision and reconstruction of the bone defect was employed to treat this aggressive tumour occurring in the metacarpal.

### III. Materials And Methods

A 28 year old male presented with complaints of pain and swelling over the left hand over a period of six months. The swelling was progressive in size and pain increased in intensity. Clinically he had a diffuse swelling of 4x2 cm in size over the dorso-lateral aspect of the left hand. Range of movements of metacarpophalangeal joint was normal. X-ray showed lytic lesion with multiple cysts over the base of second metacarpal. An MRI showed expansile lytic lesion with multiple fluid levels in the base of the second metacarpal involving the metaphysiodiaphyseal region. There was no articular involvement. The MRI picture was suggestive of an aneurysmal bone cyst or giant cell tumour.

### IV. Discussion

The patient underwent percutaneous needle biopsy (Jamshidi needle) which confirmed the diagnosis of giant cell tumour. Excisional biopsy(wide excision) with hemi fibular grafting and plating (2.7 reconstruction plate and screws) was done. The plate and screws were used to fix the remnant of the 2<sup>nd</sup> metacarpal to the trapezoid with the hemifibular graft kept in the gap after excision. The excised bone fragments of which were in turn sent for histopathology. Microscopically, a section showed oval to spindle cells with a few osteoclast types of giant cells. The patient was regularly followed up and the graft gradually consolidated. At three and half

years follow up there no evidence of recurrence was seen and the patient had a full functional range of movements of the finger.

#### **V. Conclusion**

This case illustrates that GCT of metacarpal bone (as per the evidence) is very aggressive and is best managed by marginal excision and reconstruction of bone defect. Below shown are all the relevant pictorial representations of the patients recovery after intervention during various stages of follow up which includes pre op and placement photographs for comparison of the same.



**Picture 1: Pre Operative clinical presentation**



**Picture 2: Pre operative radiograph**



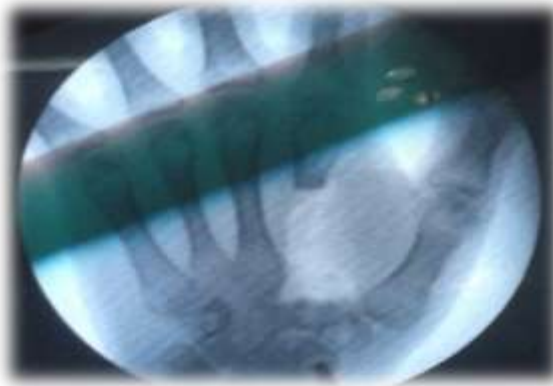
**Picture 3: Pre operative MRI**



**Picture 3.1: Pre operative MRI**



**Picture 4: Intra op picture of excised tumour**



**Picture 5: C-Arm image after resection of tumour**

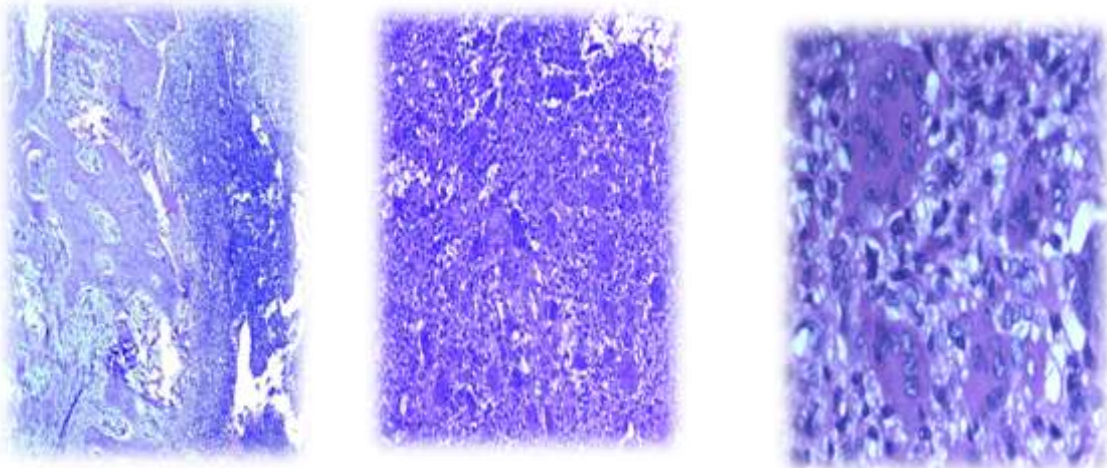


**Picture 6: Following hemifibular grafting & plate fixation**



**Picture 7: Immediate post op Radiographs**





**Picture 8: Left- Mid- Right- Histopathological picture showing oval to spindle shaped cells and osteoclast type of giant cells**



**Picture 9: 6 weeks follow up radiographs**



**Picture 10: 3 months follow up radiographs**



**Picture 11: ROM at 3 months follow up**



**Picture 12: ROM at 1 year follow up**



**Picture 14: 1 year follow up radiographs**



**Picture 15: 2 year follow up with full ROM**



**Picture 16: 2 year follow up radiographs**

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