GIANT CELL TUMOUR OF THE FIRST METACARPAL - REVIEW OF LITERATURE

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ABSTRACT

A case of giant cell tumour of the first metacarpal has been presented, its radiological features discussed and literature reviewed.

KEYWORDS: Giant Cell, tumour, metacarpal

INTRODUCTION

Giant cell tumour (GCT) also known as osteoclastoma is a benign, locally aggressive tumor with a high tendency for local recurrence. It occurs commonly during the second and third decade of life. About 85-90% of cases occur in the long bones. Occurrence in the hand is rare, only 2% have been reported and the involvement of metacarpal is even rarer[1-3]. As high as 90% local recurrence rate have been reported following treatment by curettage and bone grafting[1]. The relatively high recurrence rate after simple curettage often enforces extensive en-bloc excision[4]. Wide resection and reconstruction with structural bone grafting has also been reported to be associated with high recurrence rates[5]. Giant cell tumors form about 4-5% of all primary bone tumors. 80% of the patients are above the age of 18 years and there is a distinct female predominance, the ratio ranging from 1.3 to 1.5.

Giant cell tumor (GCT) of the bones of the hand has some special features as compared to GCT at other sites. Unni[6] reports an incidence of 1.7% for giant cell tumour of metacarpals. GCTs recur more rapidly in the hand than at other locations. The incidence of multicentric foci for GCTs of hand is 18%, indicating that a bone scan should be part of the routine workup in these tumors[1]. It occurs predominantly in the younger age-groups and displays more aggressive behavior.

This case is reported because of its rarity.

CASE REPORT

D.D is a 30 year old applicant who reported at the surgical outpatient department of the Ahmadu Bello University Teaching Hospital Zaria with complaint of progressive painless swelling of the right thumb for 8 months duration. Lately it becomes occasionally painful. There was no history of trauma or any other constitutional symptoms.

On examination a well preserved young man in no obvious distress, not pale, anicteric, afebrile, well hydrated, no lymphadenopathy. There was huge swelling involving the right thumb, the overlying skin was stretched and shiny, mildly tender but no differential warmth noted. The swelling was firm in consistency and was confined to the thumb. The remaining systems present no remarkable clinical signs.

A clinical diagnosis of soft tissue sarcoma? Osteogenic sarcoma was made.

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Laboratory tests revealed normal serum calcium, phosphorus, and alkaline phosphatase levels. Full blood count and differentials was also normal, with packed cell volume of 45%. Radiographs of the hand revealed a large expansile osteolytic lesion with soap bubble appearance involving the whole of the first metacarpal (Figure1), suggestive of Giant cell tumor.

En bloc amputation of the right thumb containing the tumor was done. Histopathological examination showed a well vascularised, highly cellular tissue consisting of sheets of mononuclear stromal cells having pleomorphic vesicular nuclei and multinucleated giant cells, in keeping with Giant cell tumour.

Post operative recovery was successful and there was no sign of tumour recurrence.

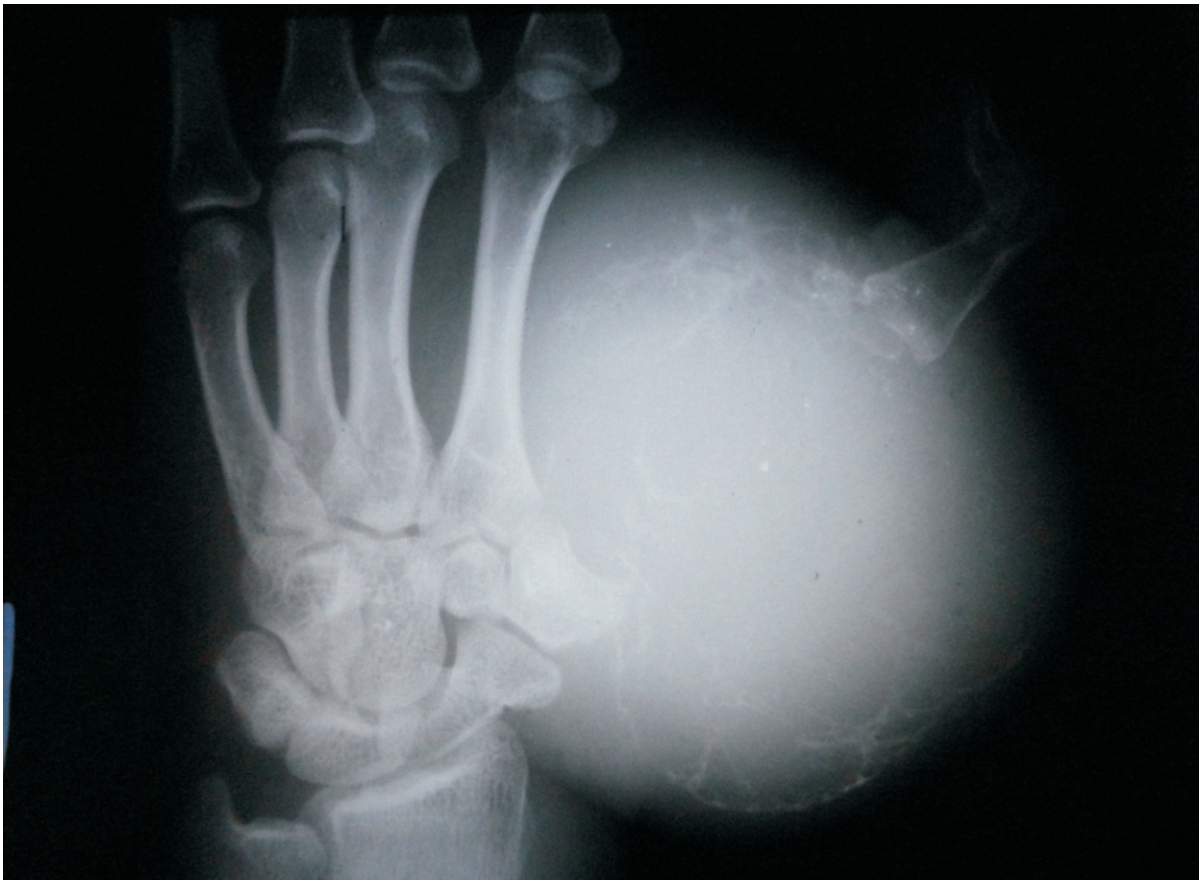

Figure 1: An oblique radiograph of the right hand showing a huge expansile lesion exclusively involving the first metacarpal with soap bubble appearance, marked soft tissue swelling is also noted.

DISCUSSION

The first reported case of giant cell tumours was in the 18th century by Cooper, but it was in 1940 when Jaffe and Lichtenstein strictly distinguished it from the other tumours[3]. Giant cell tumours usually occur de novo as in our index patient but may also occur as a rare complication of Paget disease of the bone. Giant cell tumour arises from the epiphysis and metaphyseal involvement may occur in skeletally immature patients. Another theory states that it arises from the metaphysis and extends into the epiphysis as the skeleton gets matured. In this index case the primary site of origin could not be ascertained as the tumour

has engulf the whole of the first metacarpal at the time of presentation.

Giant cell tumor occurs commonly in the age group 20-40 years, the incidence peaks at 20-30 years and are much less common in children[2]. There is a distinct female predominance, the ratio ranging from1.3 to 1.5[4]. The index case though a male, falls within the age range of GCT with an age of 30 years. Giant cell tumors are mostly solitary, and multicentric in 1-2%. 85-90% of cases occur in the long bones, the sites most commonly affected being the lower end of the femur, upper end of the tibia, the lower end of the radius[5]. Spine involvement is rare except for the sacrum. The index patient has a huge solitary lesion confined to the right first metacarpal. It should be noted that the incidence of multicentric foci for GCTs of hand is 18%, indicating that a bone scan should be part of the routine workup in these tumors[1]. In most patients, giant cell tumours have an indolent course, but they can recur locally in as many as 50% of cases. GCT is malignant in less than 5% of patients. They may be either primary occurring from the lesion or may be secondary following treatment particularly radiotherapy[1]. Although its still too early to be talking about recurrence in this index patient as most local recurrences of the GCTs of the hand are reported to occur within 1 year of primary surgery[1,5].

Also the histology shows a benign pattern, which aborted the need for radiotherapy. Radiological diagnosis of giant cell tumour can be made on plain film findings alone; thus it forms the basic or preliminary radiological investigation in suspicion of giant cell tumour[8]. The lesion is purely lytic, expansile, soap bubble in appearance and eccentrically located in epiphysis of long bones[2-5]. In this index case there was complete expansile lytic destruction of the entire first metacarpal. Periosteal reaction could be seen usually in cases of pathological fracture[7], this is actually absent in this case as there is complete destruction of the bone involved hence associated fracture could not be demonstrated.

Computed Tomography (CT) scans helps to determine the exact amount of cortical destruction and joint surface involved with optimal cortical windowing.

Radionuclide bone scan could be helpful in case of suspected multicentric tumour, which may show as increased foci of activity or hot spots. MRI may determine the extent of lesion in the bone and in soft tissue.

The definitive diagnosis of GCT is the histological finding of multinucleated giant cells, 40-60 nuclei per cell in a sea of mononuclear stromal cells. Areas of stori form spindle cell formation, reactive bone formation of foamy macrophages may also be seen. Secondary aneurysmal bone cyst may be present. The histology report of the excisional biopsy on this patient was in harmony with the latter.

The various treatment modalities described in literature are simple curettage, curettage with bone grafting, enbloc resection with reconstruction of joint surface using silastic prosthetic implants, amputation, arthrodesis, radiotherapy, chemotherapy and embolization. The use of intraoperative cryogenic agents like 10% phenol[8], hydrogen peroxide[9], liquid nitrogen, electrocautery, argon beam coagulator, warm saline or heat of methyl methacrylate[10] packing has reduced the recurrence rate by upto 10%. The metacarpophalangeal joint reconstruction can be achieved by metatarsal substitution with a combined iliac crest graft, nonvascularised fibular graft, silastic prosthetic replacement. In this case amputation was carried out without reconstruction.

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