

A Case of Giant Cell Tumor of the Metacarpal Bone Treated with Ray Amputation

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Abstract

Case Report

Giant cell tumors of the metacarpals bones are rare and commonly seen in the distal femur, proximal tibia or distal radius. It's a benign tumor locally aggressive with a tendency of local recurrence and may metastasize to lungs, ribs, regional lymph nodes, and skull. Few cases of GCT of metacarpals bones have been reported. We present the case of a 37-years-old man with a giant cell tumor of the second metacarpal bone. An effective surgical treatment must be done to prevent local recurrence since multiple surgical procedures may increase the chances of converting a benign tumor into a more malignant one. We treated our patient with ray amputation to prevent local recurrence and preserve as much as possible the function of the hand. After six months, there were no signs of local recurrence and the aesthetic and the functional results were very satisfying.

Keywords: Giant, cell, tumor, metacarpal, ray, amputation.

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INTRODUCTION

Giant cell tumor (GCT) or osteoclastoma is a benign tumor locally aggressive with a tendency of local recurrence and may metastasize to lungs, ribs, regional lymph nodes, and skull [1, 2]. It involves epiphysio-metaphyseal region of mature long bones [3]. It's commonly seen in the distal femur, proximal tibia, distal radius and very few cases of GCT of metacarpals bones have been reported [4]. We present a rare case of giant cell tumor of the second metacarpal bone treated successfully with ray amputation.

CASE PRESENTATION

A 37-years-old man presented to us with a one-year history of painful swelling of the right hand that had gradually affected movements of the index finger. His medical history was unremarkable. Physical examination found a diffuse mass of the right second

metacarpal bone measuring 6 x 5 cm and involving only the dorsal surface of the hand (Figure-1). Movements of metacarpo-phalangeal joint were restricted and painful. Radiography of the hand revealed an expansile osteolytic lesion involving the entire length of the second metacarpal and suggestive of giant cell tumor (Figure-2). CT confirmed an extensive cortical expansion and destruction (Figure-2). Therefore, a biopsy was done and the diagnosis of low-grade GCT confirmed. Due to the extent of the tumor, index Ray amputation was the choice because it would allow us a wide resection to prevent local recurrence and allow the long finger to take over the pinching actions (Figure-3). A percutaneous fixation of first and third metacarpal using K-wire was done then removed after 6 weeks. After six months, there were no signs of local recurrence. The aesthetic and functional results were very satisfying.



Fig-1: Clinical image showing a diffuse mass of the right hand involving the dorsal surface



Fig-2: Radiography and CT of the hand showing a giant cell tumor of the second metacarpal with an extensive cortical expansion and destruction



Fig-3: Clinical image and radiography after the index ray resection

DISCUSSION

Giant cell tumors of the metacarpals bones are rare (2% of cases). It predominates in the long bones: 30% of cases in the femur, 25% of cases in the tibia, 10% of cases in radius and 6% of cases in the humerus. It's a benign but locally aggressive lesion with a high local recurrence rate (30,7% to 88%) and distant metastasis [4-6]. They appear in a younger age group with female preponderance [7]. Lesions are in 1% of the cases multifocal [8]. The diagnosis requires clinical, radiological and histopathological evaluation as well as chest radiograph and bone scan to search for multicentric and metastasize lesions to the lungs [8]. Patients usually present with localized painful swelling, a limitation of joint movements, and pathological fracture. Radiography remains the mainstay of the diagnosis of GCT that manifests an eccentric lytic expansile mass that frequently extends from the subchondral bone plate into the metaphysis without any periosteal reaction. MRI needs to be done in cases of destruction of the cortex and soft tissue extension [9-

11]. Treatment modalities described in the literature are aggressive curettage or resection of the tumor followed by bone grafting, irradiation, wide resection or amputation [4, 8, 6, 12]. Wide resection must be done in cases with extensive bone destruction to prevent local recurrence [4, 8]. Sanjay *et al.*, and Ozalp *et al.*, recommend wide resection or ray amputation to prevent further recurrences at the cost of losing a functional finger [13, 14]. Kabul CS *et al.*, reported a case of GCT grade 3 of metacarpal bone treated by primary ray resection with good results [15]. Radiation is a treatment option for benign GCT of bone. Caudell *et al.*, recommend radiation as an alternative therapy to control the progression of unresectable tumor [16]. Singhal *et al.*, reported successful use of radiation in the case of metacarpal GCT [17]. Radiation has been suggested if the lesions were incompletely removed and in patients with high mitotic activity [18]. Recurrence rates are from 7% to 15% after wide excision and about 90% after curettage with or without bone [19, 20]. Reconstruction of the hand after the excision is difficult [21] and joint reconstruction can be done by a combined

iliac crest and metatarsal head graft or prosthetic replacement [22].

CONCLUSION

Giant cell tumors of the metacarpal bone are rare and should be kept in mind. They are locally aggressive with a high local recurrence rate. An effective surgical treatment must be done to prevent local recurrence and must preserve as much as possible the function of the hand. Adequate long-term follow-up must be undertaken and multiple surgical procedures may increase the chances of converting a benign tumor into a more malignant one.

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