

Giant Cell Tumor of Metacarpal Bone : A Case Report

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ABSTRACT: A case of giant cell tumor of the fifth metacarpal bone of right hand in a twenty-eight years old male is reported. An en bloc resection of the proximal end of the metacarpal bone was performed and the metacarpal defect was replaced with contoured iliac bone graft. Fixation was employed by mean of Kirschner wiring proximally and a single intraosseous wire suture distally. At 40 months of follow up, the patient was able to use his right hand perfectly and there was no evidence of local recurrence.

INTRODUCTION

Giant cell tumors distal to the wrist or ankle are uncommon. The incidence of hand involvement is 2 per cent of all giant cell tumor of bone.¹ More than 30 cases of giant cell tumor of metacarpal bone¹⁻²⁰ and fewer than 50 phalangeal giant cell tumors have been reported in the English literature.²¹ The typical radiographic finding is the extensive destruction of cortex and cancellous bone, the cortex is thin and expanded with no evidence of subperiosteal reaction. The lesion should not confuse with aneurysmal bone cyst and enchondroma of the hand. Simple curettage and bone grafting always end up with local recurrence. If the cortex is not eroded, an en bloc resection and reconstructive surgery are indicated.²²

CASE REPORT

A 28 year-old Thai monk presented with some discomfort and swelling at the base of right fifth metacarpal bone. He had a history of trauma to his right hand about 10 years ago and since then the swelling started and slowly progressed. Physical examination revealed a healthy male with no other abnormalities. The swelling located at the base of the fifth metacarpal bone, firm non tender with smooth surface. No limitation of motion of any finger and wrist joint. Radiographs of right hand showed an expansile lesion involving the whole proximal end of the fifth metacarpal bone

(Figure 1). The cortex was thin without subperiosteal bone reaction. Giant cell tumor of the metacarpal bone was the provisional diagnosis. The osteolytic lesion was categorized into grade IB Lodwick's grading system²³ and grade II Campanacci's system.²⁴ On admission, a routine film chest was normal, the blood chemistry was within normal limits. An en bloc resection of the proximal two-third of the fifth metacarpal bone was performed through dorsal incision with special care not to disturb the expansile lesion. The metacarpal defect was replaced by reshaped corticocancellous bone graft from iliac crest. The dorsal surface of hamate was decorticated and prepare for the proximal end of the contoured graft. Two Kirschner wires were inserted to fix the metacarpal proximally and distally a single intraosseous wire in the midlateral plane was used (Figure 2). The hand was immobilized in short arm splint with the metacarpophalangeal joint flexed about 80° and the wrist in extension for 4 weeks. The pathological study revealed benign tumor of bone composing of sheets of spindle stroma cells with scattered giant



Fig 1. Initial radiograph of right hand showing lytic expansile lesion of the fifth metacarpal bone. A:— AP view, B: lateral view.

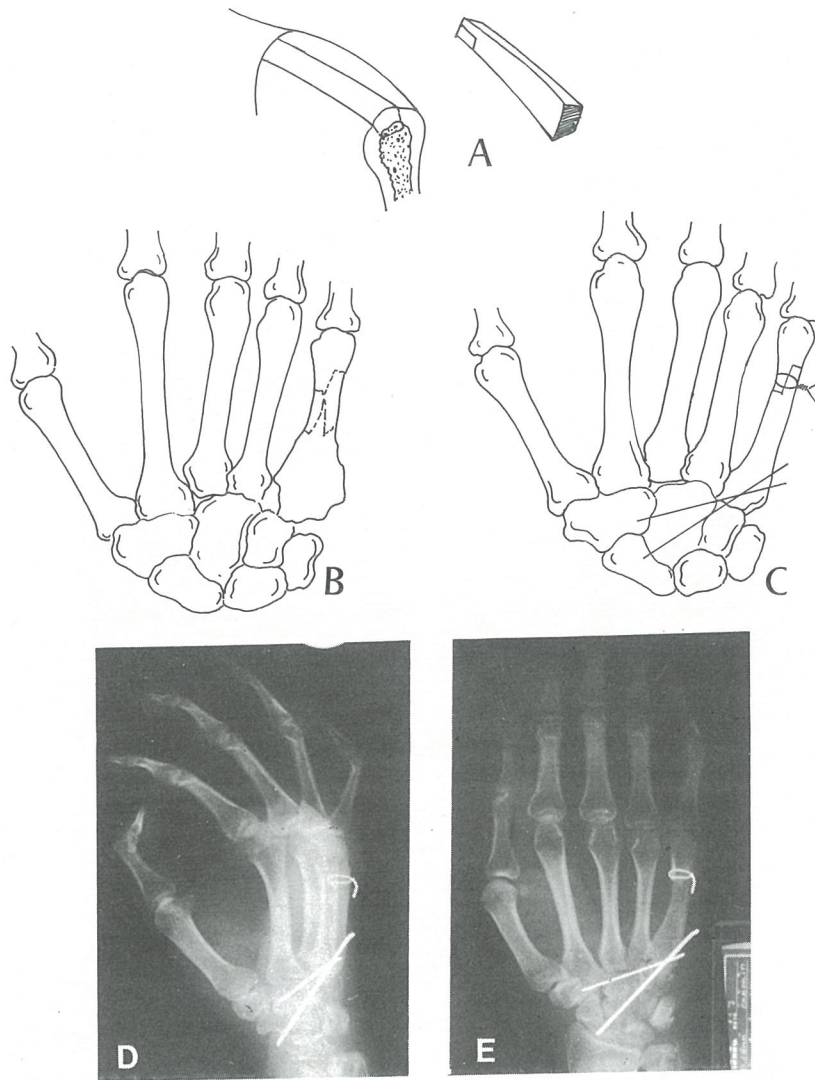


Fig 2A: A full thickness graft was taken from iliac crest.
 2B: Diagram showing lesion at the proximal portion of 5th metacarpal bone.
 2C: The graft was contoured and replaced to fit the defect.
 2D, E: AP and Lateral views of post operative roentgenogram.

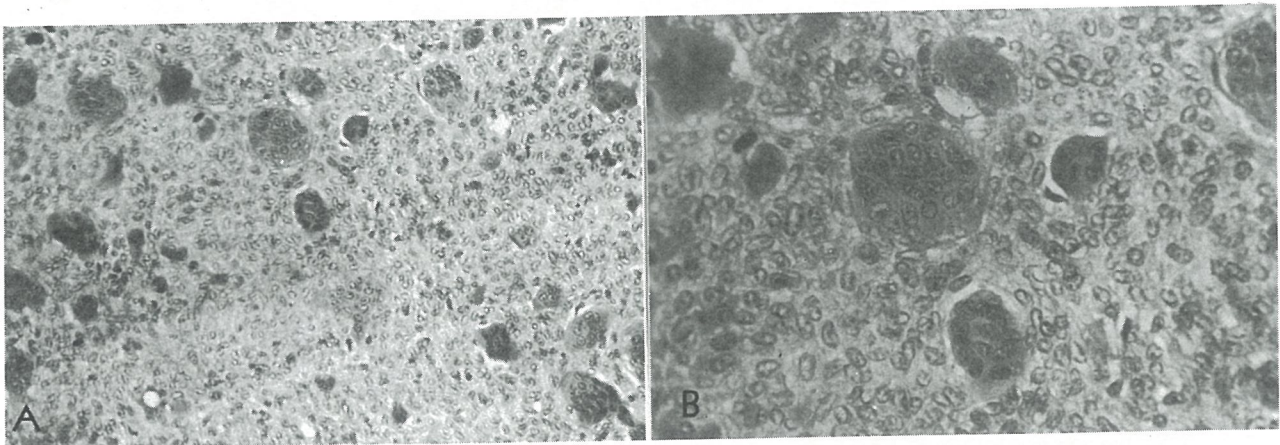


Fig 3. Photomicrograph of the histologic section;
 3A: Low power,
 3B: High power, demonstrating stroma cells and Giant cells.



Fig 4. Radiograph taken 40 months after surgery shows completed bony healing without any evidence of local recurrence.

cells (Figure 3). Three months postoperatively, the radiograph showed bony union. The wires were removed 6 months after the reconstruction. Forty months after the resection the patient demonstrated some limited fifth carpometacarpal joint motion, without any other symptom (Figures 4, 5). He is still continuing his duty as a disciple of Lord Buddha.

DISCUSSION

The first description of giant cell tumor in the English literature was by Sir James Paget.²⁵ Bloodgood was the first to propose the name "Giant cell tumor".²⁵ Since then, articles related to the giant cell appeared profusely in the world literature. Averill¹ found no evidence to suggest that giant cell tumors of the hand are more aggressive than elsewhere but Patel²¹ considered giant cell tumors in the hand to be more aggressive, with an earlier and a higher rate of recurrence than other skeletal giant cell tumors. The radiographic grading system of Campanacci did not correlate with the incidence of recurrence.¹⁸ The x-rays grading of Lodwick et al to estimate rate of growth of focal bone lesion is valid and useful in determining the treatment of

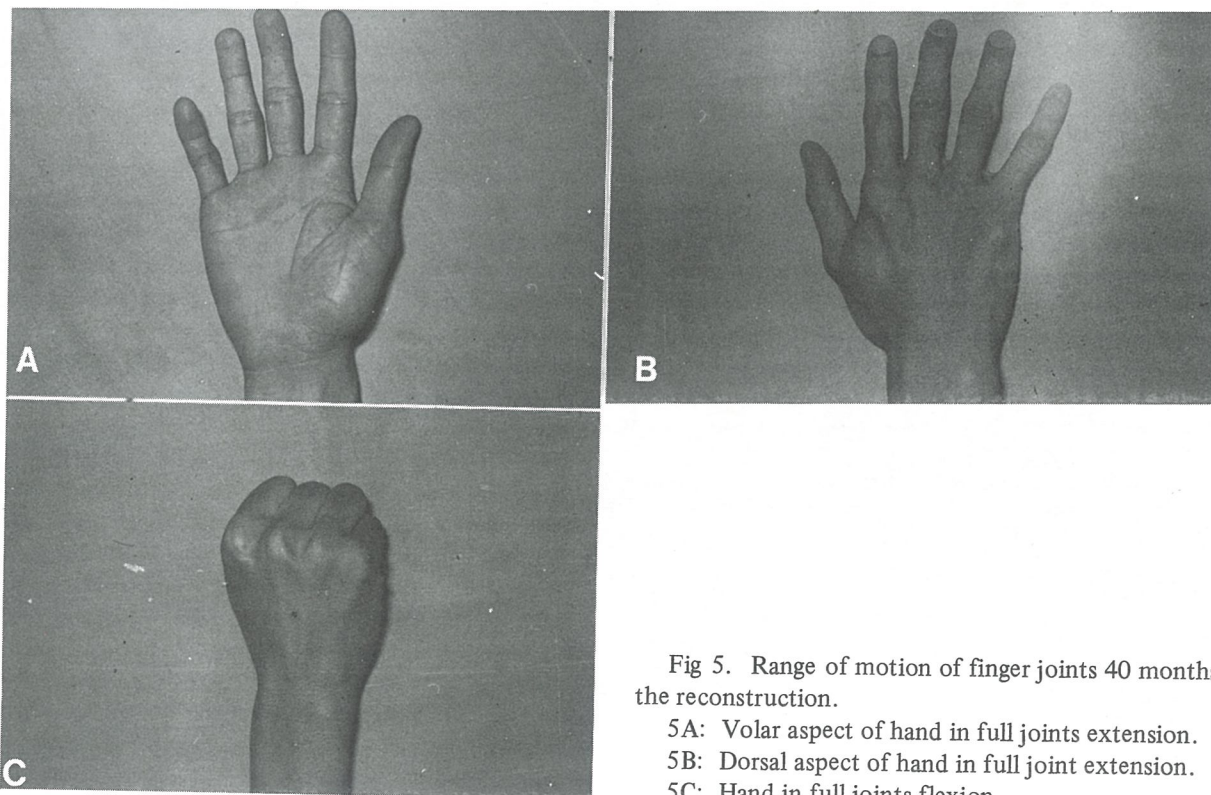


Fig 5. Range of motion of finger joints 40 months after the reconstruction.

- 5A: Volar aspect of hand in full joints extension.
- 5B: Dorsal aspect of hand in full joint extension.
- 5C: Hand in full joints flexion.

choice.²¹ The one factor that influenced recurrence was the completeness of surgical removal,¹⁸ simple curettage and bone grafting had a recurrence rate of 34-90 per cent where as wide resection had a that rate of 7-22 per cent.¹⁻¹⁸ Resection is of definite value in aggressive lesion which confine in an area where total excision can be carried out. An en bloc resection is an appropriate procedure but the metacarpal bone defect should be reconstructed. Many attempts of combined metacarpal and metacarpal and metacarpophalangeal joint reconstruction including metatarsal substitution have been reported with success.^{6,10,19,26,27} The corticocancellous bone from iliac crest is suitable and could be reshaped to reproduce the contour of normal metacarpal bone. Intraosseous wiring is a good

technique for obtaining stable internal fixation of transverse fractures, especially those adjacent to a joint.²⁸ The rigidity of an intraosseous wiring combined with a Kirschner wiring (Lister technique) was equal to a single intraosseous wiring technique.²⁹ Most local recurrences of giant cell tumor in the hand occurred in less than 9 months, only one patient that the lesion recurred 3 years after the initial management.¹ Thus a minimum 9 months of follow up is necessary for giant cell tumor of the hand. This reporting patient demonstrated no sign of local recurrence after 40 months of surgery is probably due to the completion of surgical removal and benign grading of the tumor.

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