

Case Report

Reconstruction of metacarpal bone giant cell tumor by metatarsal bone

Saikat Sau*

Department of Orthopedics, IPGMER SSKM Hospital, Kolkata West Bengal, India

Received: 24 February 2016

Accepted: 12 March 2016

***Correspondence:**

Dr. Saikat Sahu,

E-mail: drsaiikatsau@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Giant cell tumour of hand bones is not common especially in metacarpals. Considering its more aggressive behaviour and higher recurrence rate in metacarpals as compared to the other long bones, enblock resection of involved metacarpal is often required. Following resection of metacarpal, the available reconstruction techniques include metatarsal substitution, vascularized or non-vascularized fibular graft, and iliac crest strut graft. We describe a new technique of metacarpal reconstruction using a metatarsal bone and augment with k wire inside it. This new technique ensures good local control of disease, good hand function, maintains aesthetic appearance of hand associated with other reconstruction options.

Keywords: Giant cell tumor, Metacarpal, k wire, Metatarsal bone

INTRODUCTION

Giant cell tumour is a benign locally aggressive tumour involving epiphysio-metaphyseal region of long bones in young adults. Involvement of hand bones is rare.¹⁻⁴ In the hand bones, very few cases have been reported involving metacarpals.^{5,6} Giant cell tumour of metacarpals has some different features from that of other long bones.

Firstly, it has more aggressive behavior with involvement of entire length of metacarpal and soft tissue extension.

Secondly, there is a limited free space in hand and exquisite sensitivity; hence small mass can produce significant swelling, pain, and dysfunction.

Thirdly, recurrence rate is higher as compared to other long bones even after wide resection and reconstruction.^{1,2} Ray amputation ensures good local control, however, it may hamper hand function especially if it involves the index finger and cosmetically too it is not as aesthetic.³⁻⁵ The goals of treatment of giant cell tumour of metacarpal include good local control of the disease meanwhile maintaining good hand function and cosmesis. Enblock resection of the involved metacarpal

is required for local control of the disease. Various reconstruction techniques include metatarsal substitution, vascularized or non-vascularized fibular graft, iliac crest strut graft.^{1-3,6}

We want to describe another procedure that can be good option for those where metacarpophalangeal joint is involved; we took her metatarsal bone, with intact capsule anatomically matched and biological reconstruction.

CASE REPORT

A 34 years old lady presented with painful swelling over her right hand, insidious onset, gradually progressive for the last 6 months with restriction of movements of index finger. There was no history of preceding trauma or any associated constitutional symptoms. On physical examination, there was a diffuse swelling 5x2.5 cms over the right second metacarpal involving both dorsal and volar surfaces (Figure 1). Movements of metacarpophalangeal joint were painfully restricted. Radiographs of the hand revealed a large expansile osteolytic lesion of the second metacarpal involving the entire length of metacarpal suggestive of giant cell tumour (Figure 2).

MRI of the hand was also suggestive of giant cell tumour with soft tissue extension without involvement of neurovascular bundle or tendons. Jamshedi needle biopsy was performed and the histopathological evaluation revealed low grade giant cell tumour. Enblock resection of second metacarpal was planned. The tumour was extending to both dorsal and volar aspects of hand, so a dorsal approach was used for enblock resection with a cuff of normal tissue surrounding it (Figure 4). After tumour removal, the surgical wound was irrigated first with hydrogen peroxide solution.



Figure 1: Marble size swelling over 2nd metacarpal bone.



Figure 2A: Osteolytic expansile lesion involves 2nd mc bone and extending to articular surface.



Figure 2B: Within 3 month's tumor increased in size.



Figure 3: 3rd metacarpal bone anatomically matched.

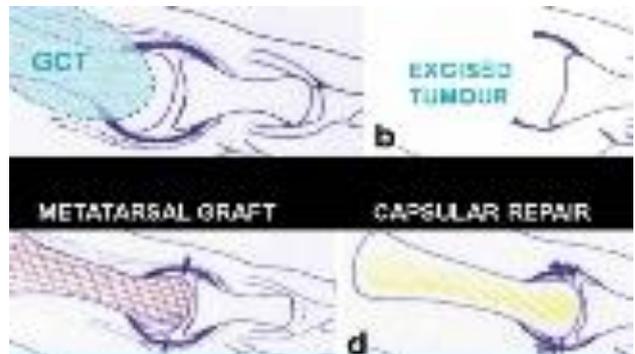


Figure 4: Plan of surgery.



Figure 5: Intraoperative dissection. Surgical gap measured.

We dissect out her 3rd metacarpal bone with intact articular cartilage and capsule of MTP joint. Cut as per length required. For the gap reconstruction repositioning of the free isograft augment with k wire and end to end capsular reconstruction done. K wire removed after 3 weeks, movement allowed. Now after 6 months follow-up patient is very much happy with her hand function. She was a professional embroider in occupation, which was not hampered.

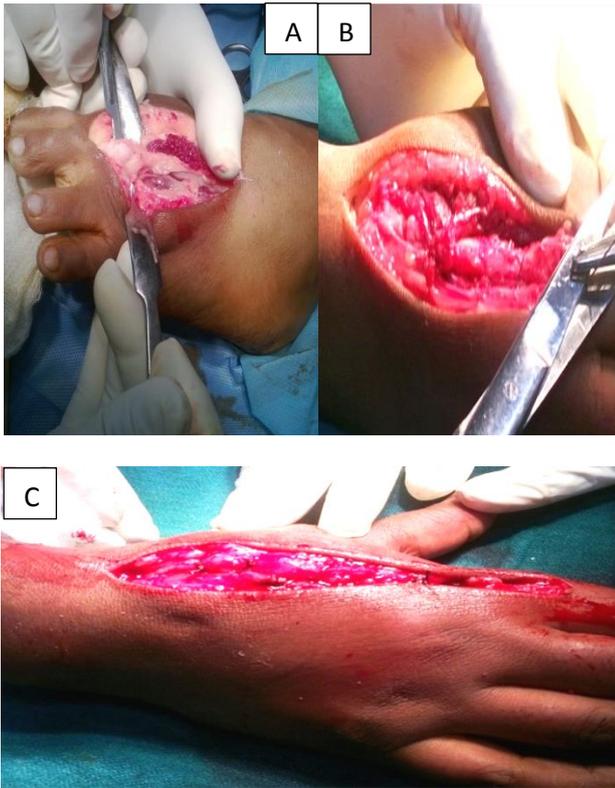


Figure 6 A, B & C: 3rd metatarsal dissection and reconstruction of hand.



Figure 7: 6 month follow up.



Figure 8: Embroidering done after operation.

DISCUSSION

Giant cell tumour of metacarpal bones is rare.¹⁻³ However, when encountered it is a quite aggressive tumour involving almost the entire length of the metacarpal at the time of diagnosis. In order to achieve long term local control of disease and to minimize the recurrence, enblock resection of the involved metacarpal is often required.^{1-3,6}

In these reconstruction options, patient has to undergo surgeries at multiple sites i.e. foot, leg and iliac crest. The surgical time is prolonged, longer post op rehabilitation time as one has to wait for longer duration till graft gets incorporated. Also there is associated graft donor site morbidity. And moreover, if there is tumour recurrence after these reconstruction surgeries, one would have already burnt all the bridges.

We recommend this reconstruction option for metacarpal giant cell tumours, using metatarsal bone less, preserves good hand function as well as maintains cosmeses. This technique can also be used for other aggressive tumours of metacarpals. However, long- term follows up and more number of cases is required to establish the overall outcome of this technique.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Kapoor A, Golwalaa P, Patela K, Desaib D, Yeluric S. Giant cell tumor of first metacarpal. Internet J orthop Surg. 2003;2:1.
2. Saikia KC, Bhuyan SK, Ahmed F, Chandra D. Giant cell tumor of the metacarpal bones. Indian J Orthop. 2011;45(5):475-8.
3. Shahid M, Varshney M, Maheshwari V, Mubeen A, Guar K, Siddiqui M. Duplication of appendix: an accidental finding. BMJ Case Rep. 2011; 2011: bcr0120113679.
4. Goldenberg RR, Campbell CJ, Bonfiglio M. Giant cell tumor of bone. An analysis of 218 cases. J Bone Joint Surg. 1970;52:619-64.

5. Averill RM, Smith RJ, Campbell CJ. Giant cell tumors of the bones of hand. *J Hand Surg*. 1980;5:39-50.
6. Dingles WR, Rolle HJ. Case report of a giant cell tumor of the second metacarpal bone and implantation of a cement prosthesis. *Hand Chirurgie*. 1979;11:251.

Cite this article as: Sau S. Reconstruction of metacarpal bone giant cell tumor by metatarsal bone. *Int J Res Orthop* 2016;2:32-5.