# Case Report

## Wide Resection and Reconstruction with Nonvascular Fibular Autograft in the Treatment of Giant Cell Tumour (GCT) Distal end of Radius

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## Abstract

Giant cell tumour (GCT) of distal radius follows a comparatively aggressive behaviour. Wide excision is the management of choice, but this creates a defect at the distal end of radius. The preferred modalities for reconstruction of such a defect include vascularized/non-vascularized bone graft, osteoarticular allografts and custom-made prosthesis. We here present our experience with wide resection and non-vascularised autogenous fibular grafting for Giant Cell Tumour of distal radius.

Key Words: Giant Cell Tumour, Wide Resection, Fibular Graft.

Chettinad Health City Medical Journal 2014; 3(4): 178 - 180

## Introduction

Giant cell tumours (GCT) are malignant and aggressive lesions with variable clinical manifestation. Treatment of GCT of bone is by curettage and adjuvant therapy to eliminate the remnant[1]. Bone graft or methylmetacrylate is used to reconstruct the resulting bone defect. But the treatment of Stage III GCT remains controversial[2],i.e., to carry out en-bloc resection or intralesional. However, the functional deficit following the surgical procedure for a giant cell tumour of distal end radius should be weighed with the chances of recurrence[3,4].

The tumour has to be completely excised in order to obtain better chance of cure but would result in compromising the articular surface, which may lead to complex and sometimes repeated reconstructive procedures. Reconstruction by Proximal fibular autograft (vascularised and non-vascularised) has been used with good results.

## Case Report

A 42 year old women, a housewife presented to the Department of Orthopaedics, Chettinad Hospital and Research Institute with pain & swelling of her left wrist(Fig 1) of 6 months duration.There was a diffuse swelling of wrist more pronounced dorsally with painful restriction of wrist movements. X-ray and MRI revealed Campanacci grade 3 GCT of distal radius (Fig 2& 3).

Cortical breach of the tumour is assessed by using Campanacci's[5] staging system. FNAC of the lesion revealed sheets of osteoclast type giant cells and moderate cytoplasmic stromal cells.

Wide resection and reconstruction with ipsilateral nonvascular fibular graft was done using dorso-radial approach(Fig 4a&4b ).Grafted fibula was stabilised to the radius with a Dynamic Compression Plate and the fibulo-ulnar joint was stabilised with a K-wire (Fig 5a&b). Cancellous graft harvested from proximal tibia was placed at radio-fibular junction. Postoperatively, wrist splint and physiotherapy were given.

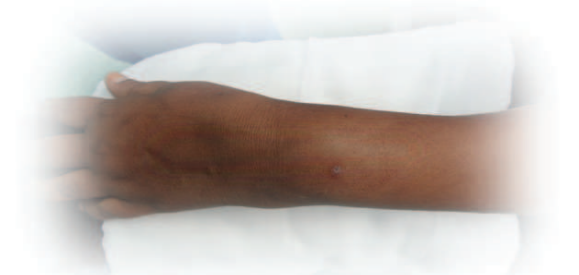

**Fig 1 -** Swelling of the left wrist

**Fig 2 -** X-ray of the left wrist showing tumour distal end of radius withcharacteristic soap bubble appearance.

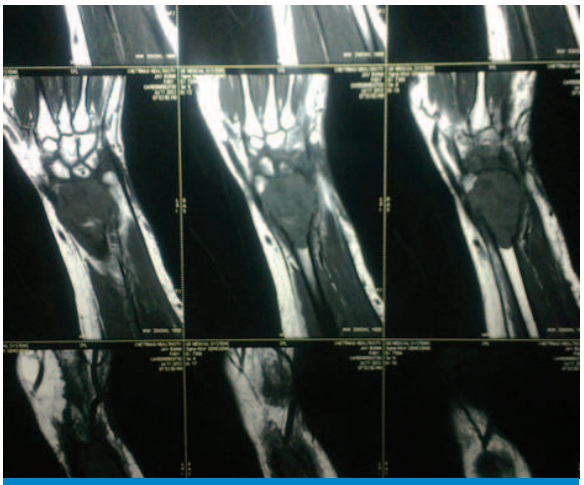

**Fig 3 -** MRI-left wrist showing Expansile Lytic lesion in the distal end of radius.

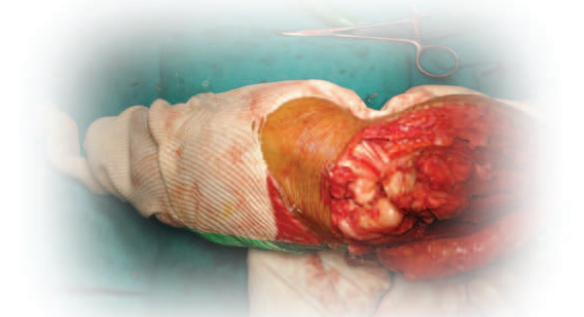

**Fig 4a -** Intraoperative picture of left wrist showing the defect after excised distal end of radius.

**Fig4b -** Resected distal end of radius alone with the tumour.

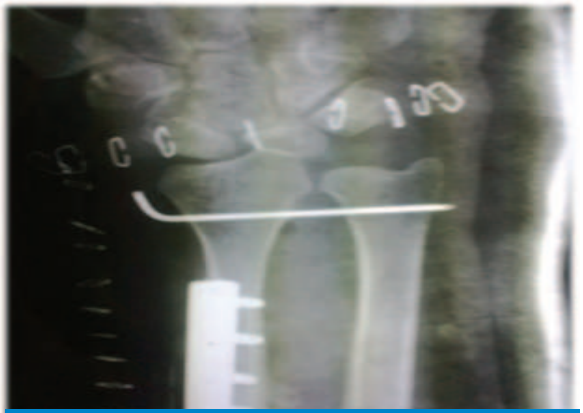

**Fig 5a -** Post operative x-ray showing reconstructed distal radius with non vascularised proximal fibular graft.

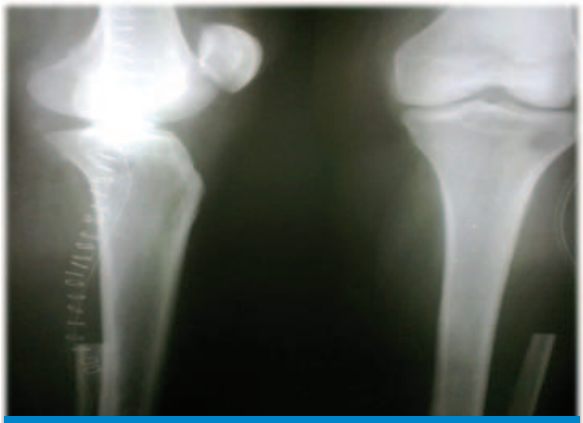

**Fig 5b -** Post operative X-ray showing resected proximal fibular.

## Results

At 15 months post-operatively, patient had painfree Left wrist dorsiflexion of 70 degrees, palmar flexion of 70 degrees(figure 6a&b) and a reasonably good rotation of forearm. She is able to perform her day to day activities comfortably. On X-ray fibula-radial junction had healed well and there were no graft related complications or tumour recurrence.

**Fig 6a -** Dorsiflexion of left wrist at 15 months postoperative period.

**Fig 6b -** Palmar flexion of left wrist at 15 months post operative period.

## Discussion

Giant cell tumour is a lesion with higher rate of recurrence[3]. Functional deficit following the surgical procedure for a giant cell tumour of distal end radius should be weighed with the chances of recurrence[4].

Thorough curettage of the tumour with bone graft for the subsequent defect is accepted only if the tumour is histologically typical (tumours that are within the intact cortex).

Curettage and bone grafting for atypical and aggressive tumours would result in collapse of the articulating surface and recurrence of the tumour, which is avoided by performing en-bloc resection with reconstruction of distal radius. En-bloc resection is strongly recommended, especially in high grade tumours and those which have recurred, have pathological fracture, have enlarged rapidly or are frankly malignant.

Reconstruction[6,7,8,9] is mandatory after resection of the tumour to maintain the function and alignment. Various techniques for reconstruction includes iliac crest bone graft, distal radial allograft, centralisation of ulna, prosthesis and vascularised or non-vascularised fibular graft and prosthesis.

Proximal fibular[10] graft is reasonably congruous with distal radius. Its incorporation as an autograft is more rapid and predictable. Moreover, there is no significant donor site morbidity, easily accessible and the functional outcome is acceptable.

## Conclusion

Although the range of movements in the operated wrist is lesser than that of non-operated, but this surgical procedure yields a satisfactory functional outcome assuring the return of patients to their previous activities. Hence wide resection and reconstruction with non-vascular fibular autograft is a reasonable treatment option for Giant Cell Tumour – Distal End of Radius.

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Answer to : **Diagnose the condition**

The ECG is characteristic of Apical hypertrophic cardiomyopathy(AHCM), a variant of Hypertrophic cardiomyopathy, commonly seen in Asian HCM patients. It shows very high amplitude (>12 large squares) R wave with giant T wave (>0.1 mV) inversion suggesting repolarisation abnormalities. The most impressive consistent changes in AHCM appear to be the enormity of the amplitude of the QRS complexes, mainly the R waves of the precordial leads, particularly V4 and the rightward posterior and superior axis of the T waves. Echocardiogram revealed hypertrophy of the septal, anterior and posterior walls, but the apical hypertrophy was more severe.

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