

PROSPECTIVE INTERVENTIONAL STUDY TO ASSESS FUNCTIONAL OUTCOME OF GIANT CELL TUMOUR OF DISTAL END RADIUS TREATED BY EN BLOC RESECTION AND RECONSTRUCTION BY ULNAR TRANSLOCATION

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Abstract

Background: Giant cell tumour (GCT) of bone is a relatively rare, locally aggressive benign neoplasm associated with a wide pathological spectrum, ranging from latent benign to highly recurrent and, occasionally, malignant metastatic potential.

Methods: This prospective study was conducted on 30 hospitalized patients for surgery in in Jaipur. We followed up all patients with GCT of the distal radius who were treated with en bloc excision and reconstruction by ulnar translocation. All cases were evaluated based on clinical and radiological examinations, passive range of motion (ROM) of the wrist joint, complications, and Musculoskeletal Tumor Society (MSTS) score.

Results: Mean follow-up period was 52.36 months, mean resected length of the radius was 7.11±2.31 cm. One patient had tumor recurrence in the soft tissues after 16.32±2.31 months (recurrence rate 10.00 %). No patient had fracture, recurrence in the bone, metastases, or immune rejection. No complications were seen, such as loosening, rupture, or dislocation. One patient developed superficial infection at the operative site which resolved after a course of antibiotics for 4 weeks. One patient experienced pain, which could be endured without the need for analgesics. Average ROM was 40.6° of dorsiflexion, 29.8° of volar flexion, 46.2° of supination, and 37.8° of pronation. Mean grip strength was 70 % (41–84 %). Overall revised MSTS score averaged 81.36 % with one being excellent, five good, and five satisfactory.

Conclusion: The optimal treatment for GCTs arising around the wrist remains controversial. Despite the trend towards better oncological control of this tumour after wide resections, the recurrence rates achieved through a more conservative procedure such as the curettage-based interventions seem to be acceptable. Additionally, distal end radius GCT en bloc excision and reconstruction by ulnar translocation allow for overall better function of the wrist in particular with distal end radius GCTs.

Keywords: GCT, MSTS, ROM

Introduction

Giant cell tumour (GCT) of bone is a relatively rare, locally aggressive benign neoplasm associated with a wide pathological spectrum, ranging from latent benign to highly recurrent and, occasionally, malignant metastatic potential.¹⁻⁴

This tumour is commonly observed in the long bone epiphyseal-metaphyseal regions of young adults, with the most common age of onset being between 20 and 40 years old. The clinical symptoms are non-specific and may include local pain, swelling, and a limited range of motion (ROM) in the adjacent joint. Radiographs and magnetic resonance imaging (MRI) are the imaging modalities of choice for the diagnosis of this tumour.¹⁻³ One of the most distinguishing clinical features of GCTs is the formation of extensive osteolytic lesions in the long bone epiphyseal-metaphyseal transitional areas.^{3,5} Histologically, mononuclear cells are the primary feature, and they determine the biological behaviour of this tumour.^{2,6,7} GCTs occur mainly around the

knee joint, involving the distal femur or the proximal tibia. Nonetheless, this tumour can involve virtually any bone, with the distal radius, proximal humerus, or the proximal femur as other frequent locations.^{5,8}

Material and Methods

This prospective study was conducted on 30 hospitalized patients for surgery in in Jaipur. We followed up all patients with GCT of the distal radius who were treated with en bloc excision and reconstruction by ulnar translocation. All cases were evaluated based on clinical and radiological examinations, passive range of motion (ROM) of the wrist joint, complications, and Musculoskeletal Tumor Society (MSTS) score.

Results:

Table 1: General characteristics of patients

Mean age	32.12±12.39 Yrs
Mean follow-up period	52.36±9.36 Months
Mean resected length of radius	7.11±2.31 cm
Recurrence	3/30 (10.00%)
Pain	1/30(3.33%)
Superficial infection	1/30(3.33%)
Duration of recurrence	16.32±2.31 months
ROM	40.6° of dorsiflexion, 29.8° of volar flexion, 46.2° of supination, and 37.8° of pronation
Mean grip strength	70.00%
Raised MSTS score	81.36%

Mean follow-up period was 52.36 months, mean resected length of the radius was 7.11±2.31 cm. One patient had tumor recurrence in the soft tissues after 16.32±2.31 months (recurrence rate 10.00 %). No patient had fracture, recurrence in the bone, metastases, or immune rejection. No complications were seen, such as loosening, rupture, or dislocation. One patient developed superficial infection at the operative site which resolved after a course of antibiotics for 4 weeks. One patient experienced pain, which could be endured without the need for analgesics. Average ROM was 40.6° of dorsiflexion, 29.8° of volar flexion, 46.2° of supination, and 37.8° of pronation. Mean grip strength was 70 % (41–84 %). Overall revised MSTS score averaged 81.36 % with one being excellent, five good, and five satisfactory.

Discussion

Since GCTs arise most often in the long bone epiphyseal metaphyseal regions, articulations are often involved, and even though GCTs of bone can arise in virtually any anatomical location, the distal femur and proximal tibia are by far the most common regions affected.^{9,10}

As expected, and based on historic series, optimal outcomes arise when a tumour is removed with free margins, minimal morbidity and an acceptable functional outcome.¹¹ In this setting, several studies report higher rates of local recurrence with intralesional curettage, even with the introduction of extensive curettage and local adjuvants.^{8,12}

In a large retrospective study of 384 patients with a decade of follow-up, recurrence rates were higher in patients treated with intralesional curettage versus those treated with wide excision (33% vs 2%). Nonetheless, among those patients treated with curettage, the addition of bone cement as an adjuvant decreased the local recurrence rate to 22%.⁸ The use of a wide range of adjuvants after curettage, such as the local application of phenol, PMMA, liquid nitrogen or a combination of several options, is the consequence of a systematic attempt to minimize recurrence rates. The use of phenol and PMMA is probably the most established treatment to use following curettage, but without clear superiority compared to other options.¹³

Conclusions

The optimal treatment for GCTs arising around the wrist remains controversial. Despite the trend towards better oncological control of this tumour after wide resections, the recurrence rates achieved through a more conservative procedure such as the curettage-based interventions seem to be acceptable. Additionally, distal end radius GCT en bloc excision and reconstruction by ulnar translocation allow for overall better function of the wrist, in particular with distal end radius GCTs.

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