Ulnar Translocation with Wrist Arthrodesis in Distal Radius GCTs: A Retrospective Analysis of Oncologic and Functional Outcomes

Ashish Rustagi[1], Ishaan Siwach
[1]Orthopaedics

INTRODUCTION:

Giant cell tumour (GCT) of bone is an aggressive local neoplasm that most commonly involves the epiphyseal sites of long bones, with distal radius as the third most frequent location. Surgical treatment of GCT at this location has special challenges as a result of the close association of vital neurovascular structures and the requirement of functional preservation. Ulnar translocation and wrist arthrodesis has become a valid alternative, especially in developing countries.

METHODS:

This case series included 10 patients diagnosed with aggressive (Campanacci Grade 2/3) GCTs of the distal radius, who were surgically treated with wide local excision, followed by ulnar translocation and wrist arthrodesis and followed up over a period of 6 years at a tertiary care public hospital in India. Resection of the distal radius was done, followed by translocation of the ulna and arthrodesis done using a 3.5 mm dynamic compression plate. Functional outcomes were measured with the Musculoskeletal Tumour Society (MSTS) scoring system and radiographs were taken routinely to follow up on bony union and recurrence

RESULTS:

Demographics and Clinical Characteristics

A total of 10 patients with aggressive giant cell tumors (GCT) of the distal radius were included in this study. The cohort comprised six males and four females, with a mean age of 33 years (range 15–67 years). The dominant side was involved in six cases, while four cases involved the non-dominant side. Six patients were classified as Campanacci Grade 2, and four as Campanacci Grade 3. Notably, seven patients presented with pathological fractures, and no cases exhibited metastatic disease at the time of diagnosis. The mean resected length of the radius was 7.5 cm (range 7–10 cm). The mean follow-up duration was 55 months.

Functional Outcomes

All patients demonstrated an excellent range of pronation and supination postoperatively. The functional outcome, as assessed by the Musculoskeletal Tumor Society (MSTS) score at the 1-year follow-up, yielded a mean score of 25.1 (range 22–28). Grip strength of the affected hand was evaluated in comparison to the opposite hand revealing good strength in eight cases and average strength in two cases.

Bony Union

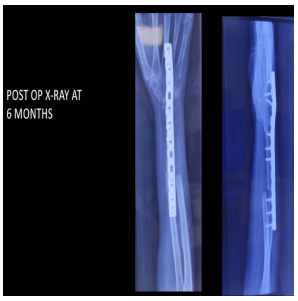
The mean time to bony union at the ulno-carpal junction was 4 months (range 3–6 months), while the mean time to union at the radio-ulnar junction was 8 months (range 7–10 months). These findings indicate satisfactory healing and bone consolidation in the majority of patients.

Complications

Two complications were observed during the study period. One patient developed cross union, which was managed successfully with an appropriate resection. Another patient experienced soft tissue recurrence of the tumor at 11 months postoperatively, which was treated effectively with revision surgery. No other significant complications, such as infections, non unions or implant failures, were seen.

DISCUSSION AND CONCLUSION:

Ulnar translocation with arthrodesis of the wrist is a biologic reconstruction method for aggressive distal radius GCTs, yielding stable wrists and maintained forearm rotation without the necessity for intricate grafting or implants. It is a dependable method of tumor control with minimal recurrence and complication rates, rendering it an appropriate choice in resource-limited environments. Functional results are acceptable despite slight cosmetic disadvantages. Additional larger-scale comparative research is required to further validate evidence for this method.



- Functional Outcomes and Bony Union

S. No.	Resection Length (cm)	Ulno-Carpal Union (Months)	Radio-Ulnar Union (Months)	MSTS Score	Grip Strength
1	6	4	9	26	Good
2	8	3.5	8	24	Good
3	7	4	9	22	Average
4	9	3	8	23	Good
5	8	5	9	28	Good
6	7	3	7	24	Good
7	6	4	10	24	Average
8	7	4	8	26	Good
9	8	4	9	28	Good
10	9	5	9	26	Good

Demographics and Clinical Characteristics

S. No.	Age (Years)	Sex	Dominant/Non-Dominant Side	Campanacci Grade	Pathological Fracture	Complications	Follow-up (Months)
1	19	M	Non-Dominant	3	No	Nil	60
2	23	F	Dominant	2	Yes	Nil	56
3	22	M	Dominant	2	Yes	Cross Union	50
4	15	M	Dominant	2	Yes	Nil	48
5	67	M	Non-Dominant	3	Yes	Nil	48
6	52	F	Non-Dominant	2	Yes	Nil	46
7	29	F	Dominant	2	No	Nil	50
8	25	M	Non-Dominant	3	Yes	Soft tissue recurrence	72
9	28	M	Dominant	2	No	Nil	62
10	55	F	Dominant	3	Yes	Nil	60