

Recurrence of Giant Cell Tumor in Fibular Graft Used for Treatment in Primary Giant Cell Tumor of Distal End Radius: A Case Report and Surgical Treatment with Excision of Tumor with Proximal Row Carpectomy with Ulnocarpal Fusion

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Learning Point of the Article:

GCT of bone is locally aggressive in nature and is associated with high incidence of recurrence.

Majority of recurrences occur within the first 2 years, late recurrences are known and long-term surveillance is recommended in these patients.

Total serum acid phosphatase (TACP) could be used as a tumor marker for monitoring response to the treatment of GCT. Measuring TACP levels at follow-up would likely diagnose recurrence; early and prompt treatment with better results could be obtained.

Abstract

Introduction: Giant cell tumor (GCT) at Distal End Radius (DER) have relatively aggressive nature and higher recurrence rate and malignant transformation than their other counterparts. There is no case reported till now of GCT recurrence in grafted fibula used for reconstruction in managing primary DER-GCT. The purpose of the study is to report the recurrence of GCT in fibular graft used for treatment in primary GCT of DER.

Case Report: A 40-year-old female was diagnosed with Campanacci Type 3 GCT-DER 7-year back. The patient was operated and treated by excision of tumor and reconstruction with contralateral fibular grafting with K-wire fixation of DER 7-year back and biopsy of growth was sent. After 7 years, the patient again developed swelling over the right wrist and radiological diagnosis of GCT Campanacci Grade 3 is made. She is managed by resection of tumor tissue by volar approach to DER with proximal row carpectomy with ulnocarpal fusion with retrograde K-wire fixation of the 3rd metacarpal resulting in centralization of ulna.

Conclusion: Recurrence in GCT also occurs at donor fibula used in reconstruction for primary treatment and could be safely managed by wide excision and centralization of ulna with good results.

Keywords: Giant cell tumor, distal end radius, fibula graft, recurrence.

Introduction

Distal end radius (DER) and giant cell tumor (GCT) have relatively aggressive nature and higher recurrence rate and malignant transformation than their other counterparts. There is no case reported till now of GCT recurrence in grafted fibula used for reconstruction in managing primary DER-GCT. The purpose of the study is to report the recurrence of GCT in fibular graft used for treatment in primary GCT of DER.

Case Report

A 40-year-old female presented to us with complaint of pain and swelling at the right wrist from the past 3 months with inability to carry out her daily routine activities. Pain was dull aching in nature, non radiating, aggravated with wrist movements, and relieved with rest. Swelling gradually increased in size. On examination, swelling was present over DER, had normal temperature overlying swelling compared to surrounding skin, no crepitus, tenderness present, and movements were painful.

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Author's Photo Gallery

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Figure 1: Pre-operative anteroposterior radiograph.



Figure 2: Pre-operative lateral radiograph.

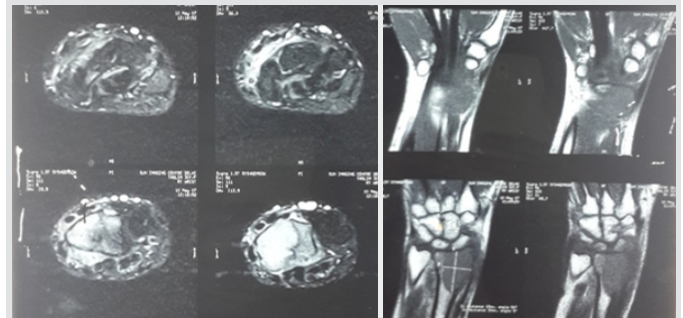


Figure 3: Magnetic resonance imaging pre-operative.

Pre-operative anteroposterior (AP) (Fig. 1) and lateral radiograph (Fig. 2) of the wrist were done which revealed an expanded osteolytic lesion at the epiphyseal region of the distal radius. Magnetic resonance imaging (MRI) (Fig. 3) and fine-needle aspiration cytology were done and GCT was diagnosed Campanacci Type 3. The patient was operated and treated by excision of tumor and reconstruction with contralateral fibular grafting with K-wire fixation of DER and biopsy of growth was sent. Above elbow slab was applied (Fig. 4 and 5).

The patient came for regular follow-up at the 1st, 2nd, and 3rd months. Union was confirmed at the 3rd month (Fig. 6) and slab was removed and K-wire removed at 9 months (Fig. 7). The patient was further followed at 3 months interval for the next 18 months with no complaints with the functional score of 21 done using the musculoskeletal tumor society system [1].

After 7 years, the patient again turned with a swelling at the same region, which is also gradually increasing in size for the past 3 months (Fig. 8) and was able to do daily routine household activities. X-ray AP and lateral views (Fig. 9) of wrist showed gross lytic expansion of the fibular graft with lytic lesions of the multiple proximal carpal bones. MRI of wrist (Fig. 10) shows expansile lytic lesion, with corticomedullary destruction. A radiological diagnosis of GCT Campanacci Grade 3 was made. Bone scan (Fig. 11) was done to rule out any metastasis and showed abnormal increased uptake seen in radiotherapy. She subsequently was managed by resection of tumor tissue by volar

approach to DER with proximal row carpectomy with ulnocarpal fusion with retrograde K-wire fixation of the 3rd metacarpal resulting in centralization of ulna. Wound is closed without tension and above elbow pop slab is applied. Above elbow pop slab is applied for 12 weeks. Physiotherapy is commenced immediately after the surgery, starting with finger movements. Wrist physiotherapy is commenced at 12-week post-surgery after confirming union.

Biopsy sample sent which confirmed the diagnosis of GCT of the distal radius. (Fig. 12) depicts hematoxylin and eosin staining of the sample smear showing features of GCT of bone with osteoclastic type of giant cells, and multinucleate cells interspersed in proliferating stromal cells (Figs. 13 and 14). The patient developed necrosis which healed on regular dressing.

No recurrence noted till the last follow-up and the patient functional score was 15 done using them usculoskeletal tumor society system.

Discussion

GCT of bone is locally aggressive in nature and is associated with high incidence of recurrence [2, 3]. Selection of proper treatment is complicated due to the failure of its histologic appearance to indicate its biology [4, 5]. The goal of treatment is to remove the tumor, decreasing the chances of recurrence [6], and preserve the joint function. Among different modalities of treatment available, simple curettage of giant cell tumor is associated with 5–15% rate of local [7], osteonecrosis with liquid nitrogen is associated with high risk of fracture.



Figure 4: Immediate post-operative X-ray.

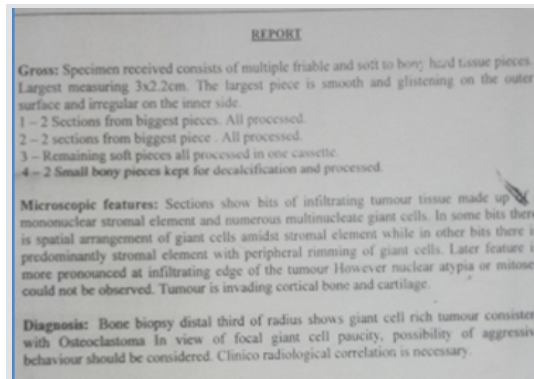


Figure 5: Biopsy report.

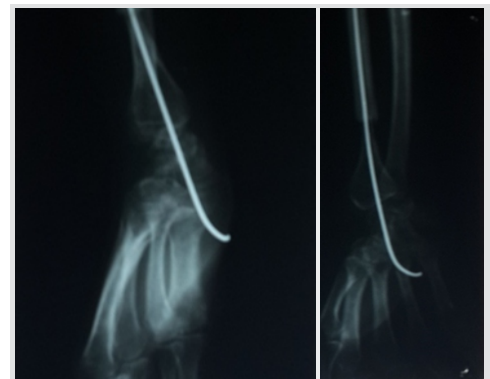


Figure 6: Three-month post-operative X-ray.





Figure 7: Nine-month follow-up.



Figure 8: Clinical photo of swelling after 7 years in wrist.



Figure 9: Seven years later anteroposterior and lateral radiograph of recurrence.

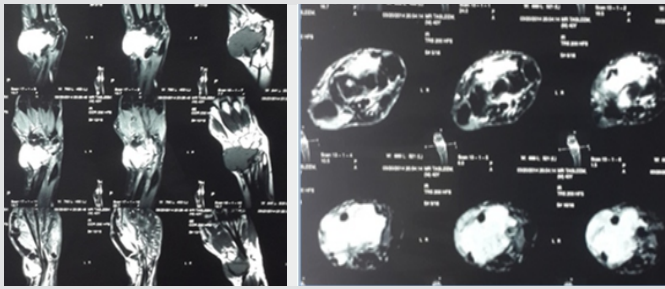


Figure 10: Magnetic resonance imaging of wrist 7 years after treatment.

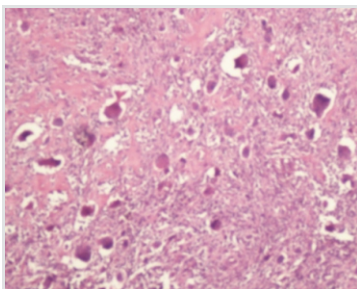


Figure 12: Hematoxylin and eosin staining of the sample smear of recurrence.

Intralesional curettage with packing of the defect with methylmethacrylate (bone cement) has become popular [8]. The free radicals and the thermal effects of the polymerization reaction can cause necrosis as much as 2 or 3 mms in the cancellous bone, with lack of

donorsite morbidity, and elimination of the risk of transmission of disease associated with the use of allograft bone, immediate structural stability, and potential for earlier detection of local recurrence.

This patient having Campanacci Grade 3 tumor recurred in the grafted fibula. This lesion is not amenable to curettage and adjuvant therapy. Hence, only option left is wide excision including carpals (scaphoid, lunate, trapezoid, and capitate) with reconstruction of the joint. The patient refused for fibular grafting, so wide excision with centralization of ulna [1, 13, 14,

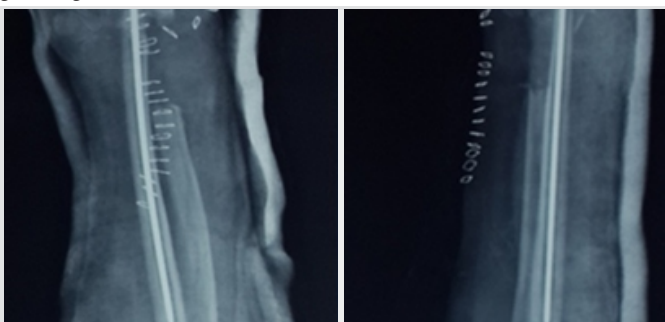


Figure 13: Anteroposterior (a) and lateral (b) view of the left wrist after immediate post-operative period of recurrence treatment.

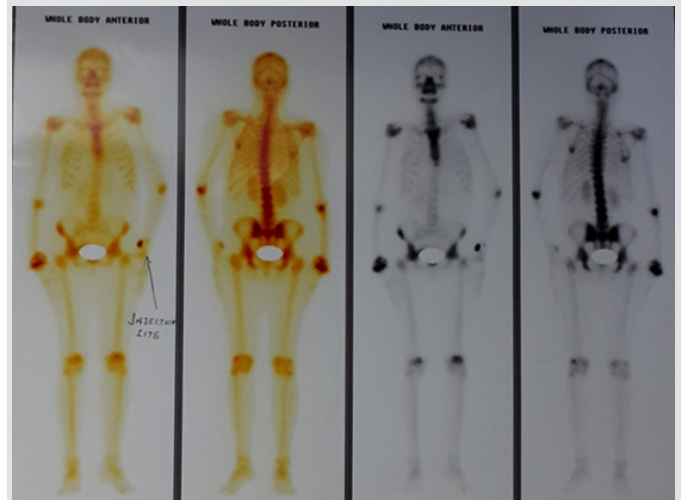


Figure 11: Bone scan at time of recurrence.

15, 16, 17] was done.

Conclusion

Majority of recurrences occur within the first 2 years, late recurrences are known and long-term surveillance is recommended in these patients as quoted by Scully et al. (1994) and Laurin et al. (1980). A recent study by Akhaneet al. (2005) suggests that total serum acid phosphatase (TACP) could be used as a tumor marker for monitoring response to the treatment of GCT. The high pre-operative TACP values in GCT patients became normalized after surgery but reappeared in recurrence. Measuring TACP levels at follow-up would likely diagnose recurrence; early and prompt treatment with better results could be obtained.



Figure 14: (a and b) Post-operative clinical photograph right wrist and forearm.

Clinical Message

Recurrence in GCT also occurs at donor fibula used in reconstruction for primary treatment and could be safely managed by wide excision and centralization of ulna with good results.

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Conflict of Interest: Nil

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Consent: The authors confirm that Informed consent of the patient is taken for publication of this case report

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