



Case Report

Wrist arthrodesis following resection of recurrent giant cell tumor of distal end of radius: A case report

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ARTICLE INFO

Article history:

Received 18-08-2024

Accepted 18-09-2024

Available online 20-11-2024

Keywords:

Giant cell tumor

Recurrence

Distal end of Radius

Wrist arthrodesis

Musculoskeletal Tumor Society
scoring system

ABSTRACT

The recurrence rate of giant cell tumor (GCT) of bone is 20%. GCT of bone is an aggressive and potentially malignant lesion, and variable clinical behaviour. The distal femur and proximal tibia are the most common sites, accounting for 50% of all GCT of bone, followed by the distal radius (10%). The prevalence of GCT peaks during the 3rd decade, with 80% of cases occurring between 20 and 50 years of age. Local recurrence and loss of joint function are still major problems following surgery. The goals of treatment are to achieve satisfactory removal of the tumor, to decrease the chance of local recurrence, and to preserve as much wrist function as possible. Here we present a case of 32-year-old female patient presented with painful lump over right wrist joint since 2 months. Previously patient was surgically treated with intralesional curettage and iliac crest bone graft and bone cement for GCT of distal end of Radius 2 years back. X-ray and Magnetic resonance imaging (MRI) showed a well-defined expansile lytic soft tissue lesion which is homogeneously enhanced involving medullary cavity with cortical erosion and extending into soft tissue plane. We performed wide resection of distal third radius and ulna using dorsal approach with radial strut graft and wrist arthrodesis. Functional outcome was evaluated using the modified Musculoskeletal Tumor Society scoring system. Grip strength was assessed using a dynamometer, and range of motion of the metacarpophalangeal joint was assessed using a goniometer.

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1. Introduction

In the recurrent giant cell tumor of distal end of radius, multinucleated giants and stromal cells multiply within subchondral region of bone. This usually benign but locally aggressive neoplasm commonly first occurs in young adults and typically arises adjacent to the epiphyseal-metaphyseal junctions of long bones such as the radius.¹

Despite its benign nature, the tumor's propensity for local recurrence necessitates vigilant management and follow-up. Histologically, it is marked by a dense collection of osteoclast-like giant cells amidst a background of

mononuclear spindle-shaped stromal cells, with areas of hemorrhage and cystic change.² Radiographically, giant cell tumors exhibit lytic lesions with eccentric, well-defined margins, frequently extending to the subarticular surface.

Usually, the management of recurrent lesions involves a combination of curettage and additional treatments such as bone grafting, cryotherapy or local adjuvants in an effort to minimize re-occurrence.³ The surgical intervention is meant to ensure complete excision while keeping intact as much surrounding normal tissues as possible so that functional loss or instability of joint may be avoided.

Whenever necessary adjuvant therapies, including PMMA cement or biologic agents can be used to enhance local control.⁴ The significance of planning

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for comprehensive treatment and prolonged follow-up cannot be underestimated especially when it comes to managing cases with high recurrence rates prompted by insufficient initial resection and tumor size thereby safeguarding limb function.

2. Case Report

Here we present a case of 32-year-old female patient presented with painful lump over right wrist joint since 2 months. Previously patient was surgically treated with intralesional curettage and iliac crest bone graft and bone cement for GCT of distal end of Radius 2 years back.



Figure 1: Radiograph showing recurrent giant cell tumor at distal end of radius

Xray (Figures 1 and 2) and Magnetic resonance imaging (MRI) showed a well-defined u expansile lytic soft tissue lesion which is homogenously enhanced involving medullary cavity with cortical erosion and extending into soft tissue plane (Figure 3).

We performed wide resection of distal third radius and ulna using dorsal approach with radial strut graft and wrist arthrodesis (Figures 4 and 5). Postoperatively, the limb was immobilised in an above-elbow slab for 3 months. Patient were followed up 6 weekly until 6 months and then 3-monthly until one year. Radiographs of the wrist and chest were assessed for recurrence and metastasis (Figures 7 and 8). Functional outcome was evaluated using the modified Musculoskeletal Tumor Society scoring system. Grip strength was assessed using a dynamometer, and range of motion of the metacarpophalangeal joint was assessed using a goniometer. (Figure 9)



Figure 2: Radiograph showing recurrent giant cell tumor at distal end of radius



Figure 3: MRI pictures of tumor

3. Discussion

There is a lot of diverse management approaches to these recurrent cases. Intralesional curettage should be the first option for any such lesions, with application of adjuvants including bone grafting or polymethylmethacrylate (PMMA) cement which fills up the defect and reinforces it thereby reducing recurrence rates. A research by Klenke et al. (2011).⁵ supported this by showing that curettage plus PMMA cement suppresses recurrence more effectively than curettage alone. According to a review by Wada et al., cryotherapy is another new technique that has



Figure 4: Intraoperative pictures



Figure 5: Intraoperative pictures



Figure 6: Resected specimen of giant cell tumor



Figure 7: Xray showing wide resection of distal third radius and ulna with radial strut graft and wrist arthrodesis with plates and screws



Figure 8: Xray showing wide resection of distal third radius and ulna with radial strut graft and wrist arthrodesis with plates and screws



Figure 9: Range of motion at metacarpophalangeal joint and grip strength at 1 year follow up was excellent with satisfactory outcome

proved effective in reducing local recurrences by inducing apoptosis by freezing.^{6,7}

Aydin et al. (2013) have concluded that high energy radiation therapy can be considered in resistant patients who are not amenable to surgical interventions though its use is often limited because of long-term complications and risk for secondary malignancies. Moreover, wider resections combined with reconstructive techniques like allografts or autografts have been recommended for more widespread or recurrent cases, based on a research paper by Puri et al.⁸

Moreover, the use of denosumab, a monoclonal antibody that has been developed to target RANKL and other novel modalities including the use of chimeric antigen receptor T-cell therapy have also been used as effective in managing recurrent GCTs (Nakashima et al., 2019). Every one of these treatments has different advantages and disadvantages ranging from surgical measures to innovative pharmaceutical interventions. In many cases, however, selection of the modality depends on such factors as patient's overall health history, tumor characteristics and previous therapeutic outcomes.⁷

4. Conclusion

In conclusion, wrist arthrodesis stands out as a good modality to treat giant cell tumors (GCTs) that recur at the distal end of the radius. It's useful when other treatments fails, this surgery doesn't just control the tumor; it also makes the wrist more stable, which has good functional outcome.

5. Consent

Written informed consent was taken from the patient.

6. Source of Funding

None.

7. Conflict of Interest


The author declares no conflict of interest.


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Cite this article: Mulimani V, Bhasme V, Naik RB, Shrivastava S, Gangadhar S. Wrist arthrodesis following resection of recurrent giant cell tumor of distal end of radius: A case report. *Southeast Asian J Health Prof* 2024;7(4):109-113.