

International Journal of Orthopaedics Sciences

ISSN: 2395-1958 IJOS 2019; 5(2): 244-247 © 2019 IJOS www.orthopaper.com Received: 15-02-2019 Accepted: 20-03-2019

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Resection- reconstruction arthroplasty for recurrent GCT of distal radius

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DOI: https://doi.org/10.22271/ortho.2019.v5.i2e.29

Abstract

Giant cell tumor is more aggressive and has a high recurrence rate in distal radius. Though many treatment options available resection reconstruction arthroplasty has low recurrence rate in recurrent cases. We have operated seven patients with GCT distal radius with contralateral non-vascularised fibula with acceptable results with no recurrences and deep infection. Although complication rate is high, autogenous non-vascularised fibular autograft reconstruction of distal radius can be considered as a reasonable option after en bloc excision of Grade III GCT.

Keywords: Recurrent GCT, resection -reconstruction arthroplasty, giant cell tumor

Introduction

Giant cell tumor of distal radius is third in location after distal femur and proximal tibia. It is a benign, aggressive tumor of obscure origin, with a definite female preponderance in the 3^{rd} or 4^{th} decade. Distal radius has a further distinction of having more aggressive behavior of GCT with higher chances of recurrences and malignant transformation.

Treatment options include curettage and grafting/cement, en-bloc excision and reconstruction with non-vascular or vascular fibular autograft, osteo-articular allograft, ulnar translocation, centralization of carpus over the remaining ulna or endoprosthesis.

Reconstruction of the distal aspect of the radius with use of an osteoarticular allograft permits wide or marginal resection and a lower rate of local recurrence. Reconstruction of wrist after enbloc excision of distal radius is a challenging task as most patients are young, active adults demanding cosmetically acceptable and functionally adequate wrist. Though amputation is curative, it is seldom warranted since the tumor rarely metastasizes.

Materials and methods

We are presenting seven patients with a Campanacci Grade III GCT of distal radius who were previously managed with curettage and grafting. The mean age was 29 (range 23-35).

All patients were treated with wide excision of tumor, reconstruction with contra-lateral non-vascularised fibula, and fixed with a small fragment plate to the remnant of the radius. All patients were followed for period of 18 months. The patients were followed up with radiological imaging which shows union at the graft site and no evidence of recurrence.



Fig 1: Pre-op image



Fig 2: Pre op image Case 2



Fig 3: Pre-op image of case 3



Fig 4: CT image showing grade 3campanacci

Surgical techniques

Under general anaesthesia under tourniquet control, through dorsal approach the tumor was resected with a margin of 2-3 cm of normal bone. The average defect ranges from 8-10 cms. Dissection done extraperiosteally to avoid tumor spillage and a margin of engulfed soft tissue excised.



Fig 5: Resection of proximal fibula



Contralateral fibula was sectioned at appropriate level by a lateral approach after carefully protecting the common peroneal nerve. The length of proximal fibula is 5-10 mm more than the defect in the radius. The fibular graft is placed over the defect and fixed with Asian DCP and 3.5 mm cortical screws. A 2 mm k wire was passed through fibuloulnar articulation and fibula and carpal bones. After achieving hemostasis, wound closure is done with a drain.

Post-operative period

The limb was immobilized in an above elbow plaster slab for a period of three months. K wires are then removed and gentle active and assisted wrist exercises were started. Heavy activity of the involved hand is not allowed for one year.



Fig 6: Immediate post op



Fig 7

Fig 8

Follow up



Fig 9: Three months



Fig 10



Fig 11: Showing dorsal subluxation

Post-operative clinical pictures



Fig 12: Functional outcome





Fig 13





Fig 14

Patient assessment

Patients were assessed using radiographs for recurrence, union periodically every 3 months and 6 months thereafter.

Results

- No recurrences or deep infection
- Radiological union was obtained in 16-20 weeks
- Grip strength of involved hand were 80%.
- Dorsal subluxation was present in three cases.
- Two patients had neuropraxia at donor site which recovered over a period of twelve weeks.

Range of movements

- Avg Palmar flexion 55 deg
- Avg Dorsiflexion 30 deg
- Pronation 50 deg
- Supination 30 deg

Conclusion

- Recurrences more common in distal radius
- Initial treatment is currettage
- Repeat curretage done in case of bony recurrence /Campanacci grade II
- Campanacci grade III resection & reconstruction offers favourable functional outcome and local control of tumors. Although complication rate is high, autogenous nonvascularised fibular autograft reconstruction of distal radius can be considered as a reasonable option after en bloc excision of Grade III GCT.

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