



GIANT CELL TUMOR OF DISTAL ULNA TREATED BY WIDE RESECTION AND STABILIZATION USING ECU TENDON: A STUDY OF TWO CASES

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<p>Article Info Received 15/02/2015 Revised 27/03/2015 Accepted 12/04/2015</p> <p>Key words: Distal ulna, Extensor carpi ulnaris tendon, Giant cell tumor.</p>	<p>ABSTRACT Several cases of long bone giant cell tumor have been reported in the literature. GCT represents 5 % - 8.6 % of all primary bone tumors and about 22.7 % of benign bone tumors. It is the 6th most common primary osseous neoplasm. The distal end of the ulna is an uncommon site for primary bone tumors. We report two cases of giant cell tumor in the distal ulna. This is very unusual, with a reported incidence of 0.45 to 3.2%. A 23-year-old Indian woman presented with a painful swelling of the left wrist. Clinically and radiologically, a diagnosis of distal ulna Giant cell tumor was made. The tumor was treated with wide resection and stabilisation of the ulnar stump using one half of the extensor carpi ulnaris tendon. In another case a 27 year old Indian male also presented to us with painful swelling of the right wrist which was diagnosed as Giant cell tumor and managed by wide resection and stabilisation using ECU tendon. One year after operation, both the patient's wrist are having full range of motion and the patients are able to perform their activities of daily living. Postoperative X-rays showed no recurrence of the giant-cell tumor. The stability of the proximal stump of the distal ulna was also maintained.</p>
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INTRODUCTION

Giant cell tumor (GCT) is a rare benign but locally aggressive bone tumor accounting for only 4% to 5% of all primary bone tumors[1]. In Southeast Asian regions, GCT accounts for approximately 20% of all primary bone tumors[2,3]. The incidence of GCT is higher in females with a peak incidence in 3rd decade. It mostly occurs in epiphysis of long bones with approximately 46.2 % lesions occurring around the knee joint[4]. Distal femur is the most common site followed by upper tibia followed by distal end radius and sacrum. Very uncommonly GCT may be multifocal (0.04 % - 1 %)[5]. The location of GCT at the distal end of the ulna is very rare. We report here two cases of GCT of the distal end of the ulna, treated with en-bloc resection of the distal ulna followed by stabilization of the

ulna stump using the extensor carpi ulnaris (ECU) tendon.

Case Report 1

A 23 year-old Indian housewife, presented to us with a painful swelling along the ulnar aspect of her left distal forearm since 2 months. To begin with, patient noticed a swelling along the ulnar aspect of her left distal forearm 2 months back which gradually increased to its present size. Patient also complained of dull aching pain in the swelling for the past 15 days. There was no other swelling anywhere else in the body, no history of fever, loss of weight or appetite. The family and personal histories were not significant. On examination, there was a diffuse oval swelling measuring 6 x 3 cm over the distal



third of ulna. The skin overlying the swelling was normal in colour and temperature with no scar, sinus or wound [Fig 2]. The mass was firm in consistency with diffuse mild tenderness present over it. The swelling was free from the overlying skin. The range of motion of left wrist was normal. Grasp power was equal in both hands and distal neurovascular status was normal. The general physical and systemic examinations were within normal limit.

Blood examinations were within normal limits. Plain radiographs of left ulna showed an expansile, multiloculated and radiolucent lesion at the distal end of ulna without any periosteal reaction [Fig 3]. Other radiographs including chest were within normal limits. Magnetic resonance image (MRI) showed a low intensity in T1 weighted image and a relatively high intensity in T2 weighted image.

A clinical and radiological diagnosis of GCT of distal ulna was made and it was confirmed on histopathologic examination. Biopsy showed osteoclastic type giant cells with basophilic cytoplasm consistent with GCT. As per Enneking Staging System for benign bone tumors, the lesion was graded as Stage 3[6]. The condition, the prognosis and the various treatment options were discussed at length with the patient. As per the recommendations, a wide resection was planned for the patient and about 2 cm margin of normal bone proximal to the tumor was resected which resulted in removal of a distal ulnar segment about 8 cm in length. It also included resection of triangular fibro cartilage complex, the ulnar border of the pronator quadratus and part of distal radio-ulnar joint capsule. Considering the age and the functional need of the patient, the ulnar stump was stabilized using extensor carpi ulnaris tenodesis technique described by Kayias & Drosos[7].

Postoperatively the patients left upper limb was immobilized in supination in an above elbow Plaster of paris slab for 10 days. After that forearm splint was used for another 1 month. Patient was advised physiotherapy

during this period which was gradually progressed to full range of motion at wrist and elbow.

Patient was followed up at 3 monthly interval and one year after the operation there was no pain in the wrist or forearm. The range of motion was 0-80° in dorsiflexion, 0-70° in volarflexion, 0-60° in pronation and 0-60° in supination. The stability of the proximal stump of the distal ulna was also maintained. X-rays of the patient's left wrist showed no recurrence of the tumor. There was no convergence of the proximal stump of the ulna toward the radius. Chest X-ray showed no metastases in the lung.

Case Report 2

A 27 year old Indian male, presented to us with a swelling along the ulnar aspect of his right distal forearm since 6 months. The swelling was associated with mild pain and was gradually increasing in size. There was no history of fever, loss of weight or appetite or any other swelling elsewhere in the body. The family, personal, occupational and recreational histories were not significant.

On examination there was a diffuse oval swelling measuring 6 x 2 cm. Overlying skin was normal and the swelling was firm with diffuse mild tenderness present over it. The swelling was free from the overlying skin. The range of motion and function of right wrist and forearm was normal.

Plain radiographs of right ulna showed an expansile, multiloculated and radiolucent lesion at the distal end of ulna. As per Enneking staging system the tumor was graded as stage 3[6]. The condition, prognosis and various treatment options were discussed with the patient and a wide resection was performed which resulted in removal of distal 9 cm of ulna. The ulnar stump was stabilized using Extensor carpi ulnaris tendon as done in case 1. Postoperatively the follow up was same as in case one and Xrays showed no signs of metastasis after one year. Histopathological examination in this case also was consistent with Giant Cell Tumor.

Fig 1. Clinical photograph of the patient showing swelling at distal end of ulna.



Fig 2. Preoperative radiograph showing expansile, multiloculated and radiolucent lesion at the distal end of ulna without any periosteal reaction



Fig 3. Intraoperative photograph showing huge swelling present at distal end of ulna



Fig 4. Resected distal end of ulna



Fig 5. Post operative radiograph 10 months after the operation shows no recurrence of the tumor.



Fig 6. (1 & 2). Ten months after the operation shows normal range of motion in left wrist



Fig 7. pre operative radiographs of Case 2 showing a lytic, expansile lesion in the distal end of ulna



Fig 8. post operative Xrays of Case 2 showing removal of the lytic lesion including part of normal ulna



DISCUSSION AND CONCLUSION

GCT is a locally aggressive benign tumor that most commonly presents with pain of variable severity and swelling as the most predominant symptom [5]. The treatment of giant cell tumors should focus on minimizing the recurrences since it is a locally aggressive tumor with a high potential for recurrence [1]. Most widely accepted treatment is removal by curettage followed by adjuvant therapy. Recurrence rate following curettage is 20% and it usually occurs within first 2 years. Total excision of the tumor and its surrounding shell of bone and periosteum is treatment of choice when small bone such as radius and

fibula is involved. Radiation is reserved for GCT not amenable to surgical resection [5].

Campanacci and co-authors proposed a Grading system of GCT based on x-rays [5].

Grade 1 – well defined margin and a thin rim of mature bone

Grade 2 – well defined but lacks a radio opaque rim

Grade 3 – fuzzy borders that suggest a aggressive neoplasm.

The distal end of ulna is a rare site for bone tumors. The most commonly used system for staging tumors at this site is the Enneking staging system which is useful for both planning treatment as well as explaining the prognosis to the patient. The distal end of ulna helps in supination and pronation (rotational) movements of forearm, maintains the relationship between carpus and distal end of radius and also maintains grip strength [10]. Many authors have advocated resection of this region of ulna in a variety of conditions [10]. The literature has evidence for both resection of the stump without any stabilization as proposed by Cooney et al [11] but many authors favour resection and stabilization of the stump to

avoid the complications of persistent pain, decreased grip strength and forearm rotation as proposed by Kayias et al[12]. In our case we have treated the patients by wide resection of ulnar stump along with resection of TFCC and ulnar border of pronator quadratus. This in our opinion could have affected the ulnar stability. Therefore to provide good functional outcome in these young patients, we decided to stabilise the ulnar stump by extensor carpi ulnaris tenodesis techniques described by Goldner et al and used for GCT of distal ulna by Kayias et al which has given good functional results in our patients and we recommend stabilisation of ulna following resection in younger patients.

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