

Rare giant cell tumor involvement of the olecranon bone

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Giant cell tumor (GCT) of bone is a relatively common benign bone lesion and is usually located in long bones, but involvement of the olecranon is extremely rare. Here, we present a case of solitary GCT of bone in the olecranon that was confirmed by preoperative needle biopsy and postoperative histological examination. The treatment included intralesional curettage, allogeneic bone grafting, and plating. At 26 months follow-up, the patient had no local recurrence.

Key words: Bone, giant cell tumor, olecranon

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INTRODUCTION

Giant cell tumor (GCT) of bone is a relatively common benign bone lesion.^[1] GCTs are usually located in long bones, and most lesions are found around the knee.^[1] Although GCTs have been observed in other less frequent sites, such as the patella,^[2,3] great trochanter, and skull;^[4] involvement of the olecranon is extremely rare.^[1] Here, we present a case of solitary GCT of bone in the olecranon that was confirmed by preoperative needle biopsy and postoperative histological examination. The tumor had already extended into the elbow joint. Therefore, the treatment included intralesional curettage, allogeneic bone grafting, and plating. At 26 months follow-up, the patient had no local recurrence. Informed written consent was obtained from the patient for submission of the data for publication. An approval from the institutional review board was also obtained. This work was supported by National Natural Science Foundation of China (NO.81071469).

CASE REPORT

A 32-year-old female was admitted to the First Hospital of Jilin University of Changchun with a complaint of left elbow pain after a minor injury. Upon physical examination, obvious tenderness was observed at her left olecranon, but no soft tissue mass was palpated. The patient also mentioned mild discomfort lasting for 1 year prior to the visit.

Anteroposterior and lateral plain radiographs showed an expansile lytic lesion located in the left olecranon and extending into the subchondral region and the coronoid process. The lesion was well-defined without a sclerotic margin. Pseudoseptations were noted. Cortical breach was also identified in the dorsal aspect of the olecranon, suggesting a pathological fracture as a source of the pain. No periosteal reaction was observed [Figure 1]. Magnetic resonance imaging (MRI) showed no soft tissue extension [Figure 2], but the tumor had broken through the subchondral bone and extended into the elbow joint. The chest radiograph and alkaline phosphatase and blood chemistry were normal.

The differential diagnosis included GCT of bone, solitary bone cyst, metastasis, and brown tumor of hyperparathyroidism. Based on the history and radiological findings, a benign lesion was highly suspected. A fine needle was positioned in the pathological fracture area along the operative incision after the administration of local anesthesia. A needle biopsy was then performed and a GCT of bone was identified by pathological section. In order to prevent local recurrence, *en bloc* resection surgery was proposed, but the patient refused. Thus, the patient was managed with intralesional curettage, allogeneic bone grafting, and plating. During the operation, incomplete fracture in the dorsal aspect of the olecranon was confirmed. The tumor had broken through the articular cartilage and extended into the elbow joint. Gross findings of the tumor indicated that it was soft in texture and yellow in color.

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Histology revealed that the tumor was composed of mononuclear ovoid and spindle-shaped cells associated with multinucleated giant cells and macrophages. This appearance was characteristic of GCT of bone [Figure 3]. At the 26-month follow-up, the patient did not present with any local recurrence.

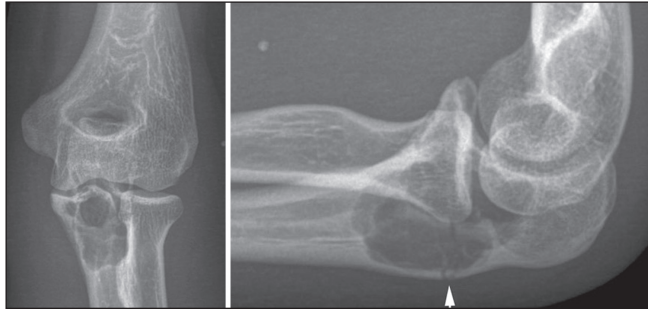


Figure 1: Anteroposterior and lateral plain radiographs showing an expansile lytic lesion located in the left olecranon and extending into the subchondral region and the coronoid process. The lesion was well-defined without sclerotic margins. Note the pathological fracture in the dorsal aspect of the olecranon (white arrow)



Figure 2: Magnetic resonance imaging (MRI) showing a relatively well-defined lesion of hyperintense signals in a T2-weighted image, and no soft tissue extension

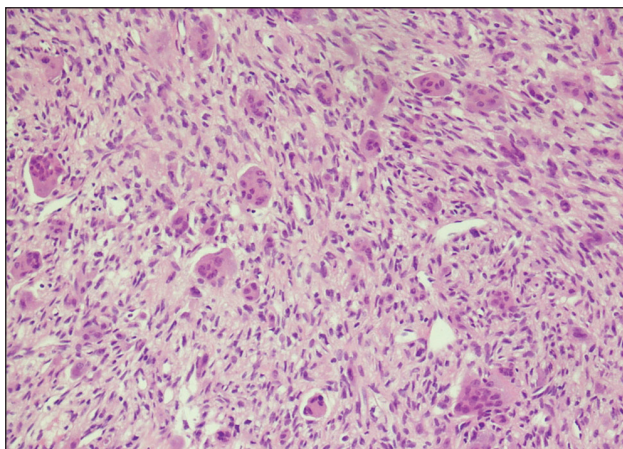


Figure 3: Histological analysis showing that the tumor was composed of mononuclear ovoid and spindle-shaped cells associated with multinucleated giant cells and macrophages. This appearance was characteristic of giant cell tumor (GCT) of bone

DISCUSSION

GCTs of bone represent approximately 5% of primary bone tumors in adults.^[5] In addition, patients with GCTs of bone present most often in the 3rd or 4th decade of life.^[1] Most GCTs arise in metaphysical-epiphysical areas and are most commonly found in the distal femur, proximal tibia, and distal radius.^[1,6] Other less frequent sites include the proximal femur, vertebral bodies, distal tibia, proximal fibula, hand, and wrist.^[1,6] In addition, GCTs occurring in the patella and great trochanter have been reported.^[2-4]

In several large studies,^[5,7,8] a total number of 1,447 GCT of bone cases has been reported, but none of them were located in the olecranon. In addition, Hoch, *et al.*,^[9] reported one patient with multicentric GCTs involving the left proximal ulna from a 12 year retrospective study conducted at the Mayo Clinic. To the best of our knowledge, our case is the first case of a solitary GCT of the olecranon. The olecranon ossific nucleus first appears around 9 years of age and fuses completely by 12-15 years of age, which is relatively earlier than other long bones.

The radiographic appearance of GCT is usually characteristic of the disease and may be sufficient for making a correct diagnosis. However, in this case, although the plain films showed characteristic findings of GCT, it was difficult to make a definitive conclusion. This was largely due to the rare location of the lesion, and the olecranon is a rare area for neoplasms to occur. Only a few cases involving this anatomical region have been reported, including a ganglion cyst,^[10] osteoid osteoma,^[11] and metastasis.^[12] A brown tumor resulting from hyperparathyroidism also presents with similar radiographic features as this type of tumor. However, the clinical course and X-ray examination of this case excluded those differential diagnoses. Other than the eccentric location, the lesion in this case had characteristics that were similar to lesions in bones with a smaller diameter, such as the proximal fibula.^[5]

Intralesional curettage has been the preferred treatment for most cases of GCT of bone, despite a higher incidence of local recurrence.^[13] The use of local adjuvants, such as liquid nitrogen,^[14] bone cement,^[15] and hydrogen peroxide,^[16] may reduce the rate of local recurrence. Wide en bloc resection is known to provide the lowest recurrence rate.^[17] Radiotherapy has also been used to treat GCT of bone in order to decrease local recurrence and is especially useful for treating difficult locations, such as the spine and sacrum.^[18]

CONCLUSION

GCT of bone is a relatively common benign bone lesion that is usually located in long bones, while involvement of the olecranon is extremely rare.

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