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Case Report

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A Giant Cell Tumor of Lateral Condyle of Humerus - A Rare Case Presentation

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Abstract

Background: A giant cell tumor is a benign, locally aggressive tumor, typically found in the epiphysis of long bone. It commonly occurs at the distal femur, and proximal tibia and rarely occurs at the lateral condyle of distal humerus. Intralesional curettage preserves the joint line.

Case report: A 14-year-old right-hand dominant female, student by profession, resident of Kanpur presented to us with c/c of pain and swelling around her left elbow for 2 years. Radiological evaluation with X-ray of left elbow s/o osteolytic, eccentric, expansile lesion with honeycomb appearance present at epiphysis extending to metaphysic in the left condyle of the humerus. HPE s/o giant cell tumor. After PAC clearance the patient was shifted to OT. The incision was given as per lateral approach, bone mass was exposed, the cortical window was made, extended curettage was done and the cavity was filled with hydroxyapatite.

Result: In each follow up the patient was evaluated clinically as per the range of motion at the elbow and radiologically according to the criterion of Irwin. At the last follow-up, she was in stage III of graft incorporation. Graft incorporation was radiologically completed in 12 months. Clinical recovery was observed before radiological healing. The average time taken to return to preoperative function was 3 months. Stage was 1 at 6 weeks and 3 months followed by stage 2 at 3 and 6 months and finally stage 3 at 9 months.

Conclusion: Intralesional curettage maintains the joint line so grades I, and II can be managed by extended curettage and hydroxyapatite, which is a biologically acceptable bone graft substitute and causes no foreign body reaction.

Keywords: Giant cell tumor; Extended intralesional curettage; Hydroxyapatite

Introduction

A giant cell tumor is a benign, locally aggressive tumor, typically found in the epiphysis of long bone. It is more common in the 3rd and 4thdecades with an M:F ratio of 1:1.5. It accounts for 5 % of all primary bone tumors and 20 % of all benign tumors [1]. It commonly occurs at the distal femur, proximal tibia, distal end radius, and proximal humerus, and rarely occurs at distal humerus [2]. It often extends to the subchondral articular bone and rarely invades the joint or capsule [3]. Recurrence rates as high as 50% have been seen in Giant Cell Tumors (GCT) of the bone, despite the use of numerous surgical procedures. Surgical margins and recurrence rate are highly correlated, depending on whether wide, marginal, or intralesional resection is performed [4]. However, wide resection may cause a significant functional impairment because of the characteristic meta-epiphyseal placement. As a result, intralesional curettage is now the most advised course of action. The gold standard for bone transplant material is autogenous bone graft. However because autograft harvesting is associated with morbidity and supply limits, many alternatives to bone have been explored [5]. The impact of intralesional curettage and calcium hydroxyapatite on patients with distal humerus GCT is the main focus of this study.

Case Presentation

A 14-year-old right-hand dominant female, student by profession, resident of Kanpur presented to us with c/c of pain and swelling around her left elbow since 2 years. Pain is insidious in onset, gradually progressing, and moderate in intensity. It aggravates on movement around the elbow. It is associated with swelling and significant weight loss. There is no h/o trauma, fever, or night cry. On local examination, there was swelling over the distal end of the humerus. It was solitary, irregular in shape, measuring approximately 3x3 cm in size, smooth surface, well-defined edge, and overlying skin appeared normal no scar mark, sinus, or ulcer. On palpation swelling was present at the distal end of the humerus, local temperature was mildly raised. It was non-tender, firm in consistency, attached to the underlying bone with free overlying skin. The swelling was non-fluctuant. Range of motion at left elbow was reduced. There was no distal neurovascular deficit and no palpable epitrochlear and axillary lymph node.

Radiological evaluation with X-ray of left elbow s/o osteolytic, eccentric, expansile lesion with honeycomb appearance present at epiphysis extending to metaphysic in the left lateral condyle of the humerus **(Figure 1)**.

Figure 1: X-ray AP and Lat view of elbow.

HPE s/o giant cell tumour

According to Enneking Campanacci staging it is stage II

After clinical examination and thorough investigation the patient was diagnosed as GCT of left distal end humerus, stage II as per Enneking Campanacci, and is planned for intralesional curettage and hydroxyapatite grafting. After PAC clearance, the patient was shifted to OT.

Procedure

Position- right lateral

Approach – lateral

An incision was given as per lateral approach and a bony mass was exposed. Multiple small holes were made with a drill bit and a cortical window was made **(Figure 2a and 2b)**. Thorough curettage was done and treated with H2O2 i.e. extended curettage was done. The bone cavity was filled with an HA block measuring 0.5X0.5X1 mm, the wound closed in the layer, an aseptic dressing was done and an a/e slab was applied. Post-operative- The patient was put on antibiotics and analgesics **(Figure 3 and 4)**.

Figure 2a: Intraop image.

Figure 2b: Intraop image.

Figure 3: HA image.

Figure 4: Post op image.

Results

In each follow up patient was evaluated clinically as per the range of motion at the elbow and radiologically according to the criterion of Irwin. At the last follow-up, she was in stage III of graft incorporation. Graft incorporation was radiologically completed in 12 months. Clinical recovery was observed before radiological healing. The average time taken to return to preoperative function was 3 months. Stage was 1 at 6 weeks and 3 months followed by stage 2 at 3 and 6 months and finally stage 3 at 9 months **(Figure 5a-c)**. There was no incidence of graft rejection, collapse, growth plate disturbances, or antigenic response.

Figure 5a: Post op x ray at 3 months.

Figure 5b: Post op x ray at 6 months.

Figure 5b: Post-op x-ray at 9 months.

Discussion

A study by Gupta AK shows no occurrence of GCT at the distal humerus **(Figure 6) [6]**.

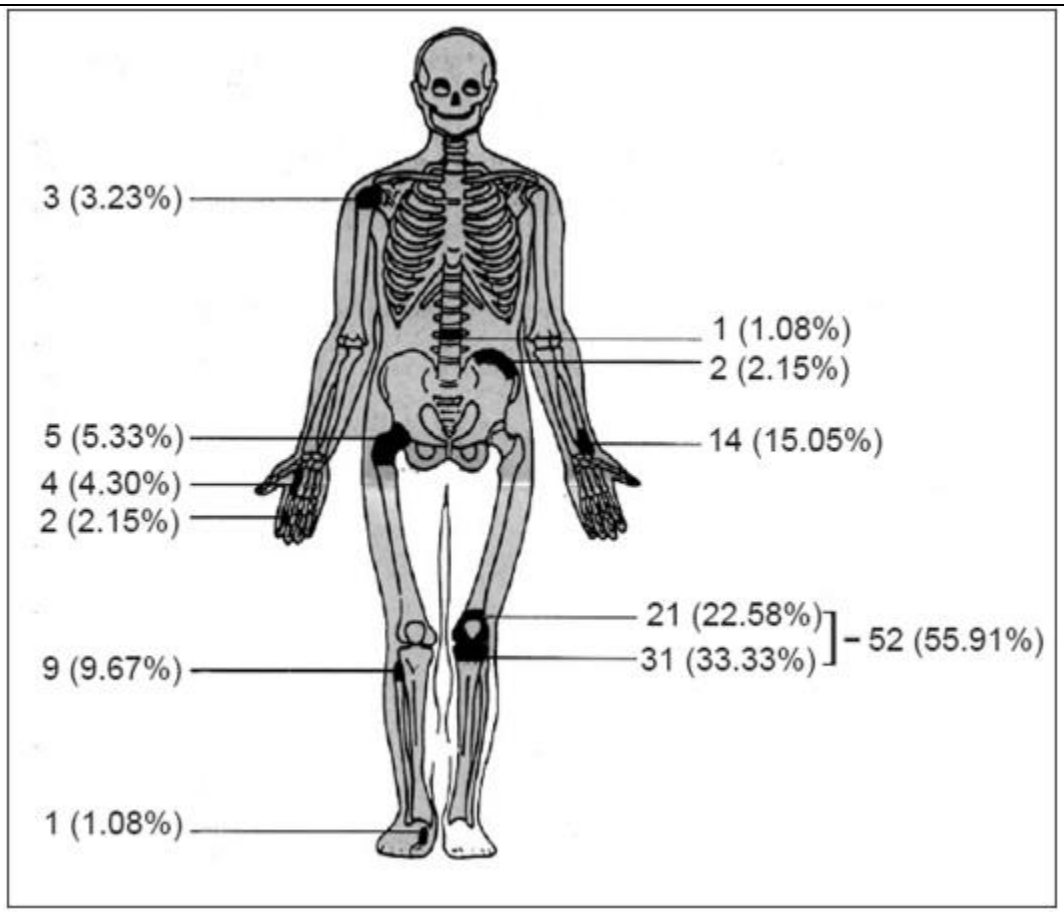

Figure 6: Regional distribution of giant cell tumor of bone.

Surgical management of GCT tumor is based on Enneking Campannaci grading. Extended intralesional curettage and void filling by bone graft/bone substitute/ bone cement for Grades I and II. Wide excision and joint reconstruction for grade III. Extended intralesional curettage causes the removal of tumor tissue and maintenance of the joint line. In our case, it is grade I and extended intralesional curettage of the lesion is done and the void is filled with hydroxyapatite. HA has an ultra-porous structure and helps in osteo conduction. It provides a scaffold for osteogenesis. The ultraporous structure helps in the migration of osteoblast, osteoclast, and fibroblast along with the unobstructed flow of nutrients and fluid **[7].** In this study, the range of motion at the elbow was checked at each follow-up. The patient gained normal painless ROM at the elbow in 3 months. A study by Gupta AK shows that in osteolytic lesions treated by intralesional extended curettage and HA, clinical recovery occurred in upper limb cases at an average of 7.7 months (range 6–12 months) **[7]**. In this study, the radiological outcome was assessed by Irvin et al criteria. Stage was 1 at 6 weeks and 3 months followed by stage 2 at 3 and 6 months and finally stage 3 at 9 months. A study by Tsai et al. where the x-ray image series were obtained from 27 of the 33 patients with HA bone substitute showed proper bone healing and an 81.8% fusion rate after 6–12 months of follow-up **[8]**.

Conclusion

Intralesional curettage maintains the joint line so grades I, and II can be managed by extended curettage and hydroxyapatite, which is a biologically acceptable bone graft substitute and causes no foreign body reaction.

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