

## **Title**

(Category: Surgical Treatment – Margins, Local Recurrence)

## **The Preliminary Optimistic Outcomes of Extensive Curettage for Extremity Giant Cell Tumors with Pathological Fracture**

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## **Abstract**

### **Background**

Pathological fracture is a commonly thing. Approximately one in five patients with giant cell tumor (GCT) of bone presents with pathological fracture. There are still controversies in surgical strategies for these patients. The goal of GCT is tumor control and durable reconstruction with fewer complications.

### **Questions/purposes**

The aim of this study is to verify extensive curettage could manage good local control and durable reconstruction in GCT with pathological fracture. To verify any difference of the local recurrence rate and function compared with the cases without fracture.

### **Methods**

We retrospectively analyzed sixty-one extremities GCT with pathological fracture patients from 2001 to 2013, all the patients has at least 24 months follow-up. Twenty-two patients who achieved extensive curettage surgery were included in this final retrospective study. There were 13 males and 9 females. The mean and median ages were 29.59 and 26 years respectively (range, 13-64). 11 cases in the distal femur, 8 cases in the proximal humerus, and 3 cases in the proximal femur. Skeletal traction was used in distal femur disease and external fixation was used in proximal humerus

lesion, which were underwent extensive curettage after 12 weeks with fracture healing. Bisphosphonates was used every 3-4 weeks. X-ray and mechanical alignment check every 2 weeks, confirm the lesion was stable without progress. AO classification (type A/B/C) was used to evaluate the type of fracture. Campanicci system for image grading study. Extensive curettage surgery and reconstructions, local recurrence and function were included in the statistical parameter.

## **Results**

In this series, there were 9 with type A fracture, 12 type B and 1 type C, the joint involved in type B and C. The primary neoplasm present Campanicci grade 2 in 8 cases and grade 3 in 14 cases. Each patient achieved extensive curettage surgery. There were 17 cases underwent cementation, 3 cases unicompartmental arthroplasty with allograft and 2 cases total hip replacement. With a mean and median follow-up of 47.5 and 40 months respectively (range, 24-149), 2 patients developed local recurrence (2/22 , 9.1%), and without recurrence within the joint. Compared with the local recurrence rate of large series GCT without fracture in our institution published before(10/116,8.6%), it present no significant difference( $P=0.603$ ). There was no significant difference between fracture type regarding to local recurrence ( $P=0.606$ ), and also no significant difference between Campanicci grading system regarding to local recurrence ( $P=0.686$ ). 3 patients had minor joint degeneration (3/22,13.6%), movement without limitation in knee joint, no infections and no complications need further surgery. The mean of functional scoring with Musculoskeletal Tumor Society (MSTS) was  $92.1\% \pm 6.6\%$ , compare with the large series GCT without fracture in our institution with  $92.6\% \pm 8.2\%$ .

## **Conclusions**

(1) Extensive curettage surgery had satisfied tumor control. The local recurrence rate of GCT with pathological fracture was similar to the cases without fracture in extremities. (2) The fracture type and Campanicci grading did not affect the local recurrence rate. Extensive curettage has wide range of indications. (3) Preserve the joint of the patients, there was no fatal reconstructive complications which need further revision in this series. (4) Because of the bone self-repair and remodeling, we

achieved durable reconstruction, which is considered worthy of recommendation. We demonstrate favorable local control in neoplasms recurrence and satisfactory functional outcomes in GCT with pathological fracture in extremities.

**Level of Evidence:** Therapeutic Level IV.