

(Number 11228)

## **Giant Cell Tumor of Bone treated with Minimal Access Curettage and Perioperative Bisphosphonates: a mean follow-up of 4.8 years**

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### *Background*

For local tumor removal in benign bone tumors, intralesional curettage is performed via adequate surgical access and under good visualization of the curetted cavity. Bisphosphonates has been used as a possible adjuvant treatment to reduce local recurrence in patients with giant cell tumor of bone (GCT) as in-vivo study showed its anti-tumor effects on both osteoclast-like giant cells and neoplastic stromal cells. Intralesional curettage under endoscopic and/or navigation guidance have the advantages of minimal invasive surgery in GCT patients while perioperative bisphosphonates may help reduce the local recurrence even with minimal access approach.

### *Questions/Purposes*

We asked

- 1) Is minimal access curettage feasible in treating giant cell tumor of bone;
- 2) What is the rate of local tumor recurrence with the minimal access technique and perioperative bisphosphonates; and
- 3) What are the complications related to the approach.

### *Patients and Methods*

Between November 2008 and August 2013, 10 males and 8 females GCT patients with a mean age of 33.2 (13 to 50) were included. Patients with pathological fracture were excluded. Tumors were located at proximal femur (3); distal femur (4); tibia (5); tarsal bones (2) and distal radius (4). CT scans of the affected areas were acquired during image-guided biopsy. The 3D bone-tumor models were created for planning the site of skin incision and cortical window. All tumors were curetted under endoscopic assistance and seven tumors with internal calcified septae were performed with additional CT-based navigation. The bone defect was filled up with cement. Perioperative bisphosphonates (intravenous Zoledronic acid) was given in all

patients.

### *Results*

Computer navigation allowed easy identification and removal of bony septae within tumor cavity. The magnified endoscopic images provided excellent assessment of the adequacy of tumor clearance during curettage. The mean wound length was 44mm (25 to 90). The mean early postoperative wound pain score (VAS) was 2.9 (2 to 6). All patients could achieve a full range of joint movement at 4 weeks post-surgery.

After a mean follow-up of 55 months (21 to 78), three (17%) local recurrence (distal radius 2 and proximal tibia 1) were noted. Two of three patients could be managed with further endoscopic-assisted curettage and one with wide resection. One of the patients developed second recurrence that was successfully treated by endoscopic-assisted curettage and Denosumab.

All patients did not experience adverse effects with bisphosphonates and major complications related to the technique.

### *Conclusions*

In this study, endoscopic technique and/or computer-assisted and perioperative bisphosphonates was a safe approach that may allow minimal access curettage in GCT patients without compromising local tumor control. With bisphosphonates, the less invasive approach may preserve more normal bone, reduce postoperative pain and achieve faster functional recovery. The more local recurrence in distal radius GCT warrants further study. Comparative studies in patients treated with Denosumab will be useful.