FUNCTIONAL OUTCOME OF DISTAL TIBIA GIANT CELL TUMOUR

Abstract:
This is a prospective study of the functional outcomes of Giant cell tumor of tibia. Giant cell tumor of bone (GCTB) is an intermediate, locally aggressive but rarely metastasizing tumor. A total of 6 patients were studied and followed up. Perioperative information and complication were recorded and assessment of functional outcome was made. The treatment of GCT particularly in distal tibia is directed towards local control without sacrificing joint function. This has traditionally been achieved by intralesional curettage and packing of cavity with bone graft or bone cement. We treated all our cases with extended curettage with chemical adjuvant as hydrogen peroxide. We packed the cavity with bone cement. All our cases are having excellent results with no recurrence.

Keywords: Giant cell tumor of Distal Tibia, Intralesional curettage and packing of cavity with bone graft or bone cement
Introduction

Giant cell tumor of bone (GCTB) is an intermediate, locally aggressive but rarely metastasizing tumor, representing 5% of primary bone tumors and 20% of benign bone tumors. It occurs mostly between the ages of 30–50 years and rarely arises in the immature skeleton. There is a slight predominance for female patients. At presentation, 15%–20% of patients have a pathologic fracture due to substantial cortical destruction followed by relatively minor trauma. GCTB is typically seen solitary, mostly located in the meta-epiphyseal region of long bones (85%) but may also occur in the axial skeleton (10%) or occasionally in the small bones of hands and feet (5%). At the latter location, so-called giant cell lesion of the small bones—a different entity—should be considered. Nearly 6% of GCTs occur in the foot and ankle region, with the distal tibia being the most common location.

The main problem in the management of GCTB is local recurrence after surgical treatment: 27%–65% after isolated curettage; 12%–27% after curettage with adjuvants such as high-speed burr, phenol, liquid nitrogen, or polymethyl methacrylate (PMMA); and 0%–12% after en bloc resection. In clinical practice, the choice of surgical treatment depends mostly on the feasibility of curettage and local adjuvants versus resection but also in part on the expected risk for local recurrence in each individual patient. In distal tibia, the treatment of GCT is directed towards local control without sacrificing joint function. This can be achieved by intralesional curettage with autograft reconstruction or by packing the cavity using bone cement.

Materials and methods

Our study is a prospective single centered study at Govt. Mohan Kumaramangalam medical college hospital, Salem. Patients treated between 2013 to 2016 were included in the study. A total of 6 patients of distal tibial GCT were studied. Out of 4 were female and 2 were male patients. Age group was between 24 and 42 years. Only biopsy proven giant cell tumours were included.

Campanacci grading was used for cortical breach. Grade I tumor had a well margined border of a thin rim of mature bone and the cortex was intact or slightly thinned but not deformed. Grade II tumor had relatively well defined margins but no radio-opaque rim. Grade III tumors had fuzzy borders. Enneking staging was used preoperatively. Stage I is defined as a latent (inactive) lesion that is asymptomatic, intracompartmental and histologically benign. Stage II has been defined as active, symptomatic and intracompartmental. Stage III is an aggressive lesion that is extra compartmental. Patients registered during the course of the study were evaluated with clinical examination, radiological evaluation and histopathology. All data was recorded on a prefixed proforma. Radiographs and MR scans were done for all patients. Chest radiographs were done in all patients. All cases were epiphyseo-metaphyseal.

Extended curettage with bone cementing for all cases. Hydrogen peroxide was used as adjuvant.

Case 1- Intra Op Photos
Follow up of cases was from 12 to 36 months. No recurrence was found during the follow up period. Superficial wound infection was found in one case which subsided with appropriate antibiotics. Joint function was preserved in all 6 cases.

Discussion

The treatment of GCT particularly in distal tibia is directed towards local control without sacrificing joint function. This has traditionally been achieved by intralesional curettage and packing of cavity with bone graft or bone cement.

Regardless of how thoroughly performed, intralesional excision leaves microscopic disease in the bone and hence has a reported recurrence rate as high as 60%. Although a marginal or wide excision of the involved bone is curative if contamination is avoided, it is associated with reconstruction and disability problems. In order to counter the above problems, a great deal of effort has been expended on attempting to “extend” the curettage or intralesional excision by chemical or physical means. Adjuvants such as phenol and hydrogen peroxide after completion of curettage may be of additional benefit in helping to decrease recurrence rates after curettage. The key to ensuring an adequate curettage with complete removal of tumour is obtaining adequate exposure of the lesion. This is achieved by making a large cortical window, using a head lamp and dental mirror combined with multiple angled curettes and use of high power burr to break bony ridges.

After successful extended curettage, filling up of cavity is essential.

There are two options.
1. Use of auto / allografts
2. Cementation using methyl methacrylate

Cementation using methyl methacrylate has shown encouraging results. It is postulated that the exothermic reaction of methyl methacrylate generates local hyperthermia which induces necrosis of any remaining neoplastic tissue, yet it does not extend to the normal tissues to result in local complications. In theory, the possibility that the polymerization of methyl methacrylate may produce a local chemical cytotoxic effect cannot be excluded. Compared to bone graft cementation provides immediate structural support with no donor site morbidity. Radiological recurrence is easier to spot. We treated all our cases with extended curettage with chemical adjuvant as hydrogen peroxide. We
packed the cavity with bone cement. All our cases are having excellent results with no recurrence till date.

Conclusion

Extended curettage with bone cementing used as treatment modality for aggressive bone tumours of distal tibia provided better radiological and functional outcome without any recurrence. Limitations of study include small subset of patients with less duration of follow up. Further continuance of the study is required to validate our treatment protocol.

References