Evolution in treatment of locally aggressive Giant Cell Tumor of bone: analysis of 37 cases

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Introduction

Giant Cell Tumor of bone (GCTB) is an aggressive primary benign bone tumor causing progressive osteolysis, most commonly in periarticular locations. Due to high local recurrence rate after isolated curettage and morbidity of resection, different local adjuvants such as cementation, phenolization and cryosurgery have been used after intralesional curettage to improve local control and achieve joint preservation. Moreover, in recent years systemic targeted therapy with RANKL inhibitors (Denosumab) or bisphosphonates has been introduced in the treatment of GCTB.

Patients and Methods

We performed a retrospective review of all consecutive patients (n=37; M/F: 21/16; mean age: 36, range 17-66 years) who underwent surgical treatment for GCTB with the intraoperative use of cryosurgery between 2000 and 2015. It was primary diagnosis in 32 cases, recurrence in 5 cases. The lesions were most frequently localized in the lower limb (n=23; 13 distal femur, 4 distal tibia, 3 proximal tibia, 2 proximal femur, 1 rotula), followed by the upper extremity (n=7; 3 distal radio, 2 proximal humerus, 1 distal humerus, 1 hand) and the pelvis (n=7). Thirty-three patients (group 1) underwent intralesional curettage with adjuvant cryosurgery and bone defect reconstruction with cement (n=18), bone graft (n=9), bone graft and cement (n=9), in 5 patients zoledronic acid was added to bone and/or cement. Eighteen of these patients additionally received denosumab according to our institutional protocol (10 pts before and after surgery; 4 pts only before surgery, 4 pts only after surgery); one patient received zoledronic acid before and after surgery instead of denosumab. In the remaining 4 patients (group 2), with pelvic and sacral lesions, cryosurgery was used during curettage/resection to reduce bleeding and facilitate the excision.

Results

The mean follow-up was 31 months (range 2-145). No patient suffered neurovascular injury. There were one skin necrosis and one superficial infection, both healed after conservative treatment. No fractures of on-site treated segments were observed, probably due to frequent use of preventive plate fixation (n=21). No deep infection was observed. Two patients with tumor located in the distal tibia developed radiographic osteoarthrosis and osteochondral lesion of the talus, both asymptomatic. All tumors demonstrated positive response to denosumab and a surgical “downstaging” was achieved in all 14 patients who received pre-operative treatment. No adverse effects of denosumab or zoledronic acid treatment was observed. Two patients of group 1 developed local recurrence (2/33, 6%), both patients were treated with denosumab (one before and after surgery; one only before surgery). One of these patients developed two more local recurrences and lung metastasis. A repeated curettage was performed in all cases, with actual local control.

Conclusion

On the basis of our results, our actual trend in the treatment of locally advanced GCTB is 3-4 doses of neoadjuvant Denosumab followed by aggressive curettage, cryotherapy, acrylic cement added with bisphosphonates and plate fixation. A longer follow-up is needed to confirm our results.

Keywords : GCTB, targeted therapy, cryosurgery

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