Downgrading Giant Cell Tumor of the bone with Denosumab

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INTRODUCTION

Giant cell tumor of bone (GCTB) is a benign, locally aggressive, giant cell-rich neoplasm that commonly affects young adults. GCTB may be locally aggressive and local recurrence is challenging.

Denosumab is a human monoclonal antibody that specifically inhibits osteolysis by preventing RANKL-mediated formation and activiation of multinucleated osteoclasts or giant cells from RANK-positive mononuclear preosteoclastes and macrophages. Indications for Denosumab (Prolia) are treatment/prevention of idiopathic osteoporosis, osteoporosis induced by hormonal treatment and in higher dose as XGEVA for metastatic bone tumor problems and benign GCTB.

After initial widespread use of XGEVA for GCTB about 10 years ago, euphoria has waned and indication, dosage and duration of treatment are discussed controversially. Our index patient received 6 injections of XGEVA over 4 months with 120 mg/injection. We decided to start the therapy with a short neoadjuvant use of XGEVA with the aim of less tumor regression and improved tissue quality when surgical curettage is performed. We wish to share our experience with a short neoadjuvant treatment protocol.

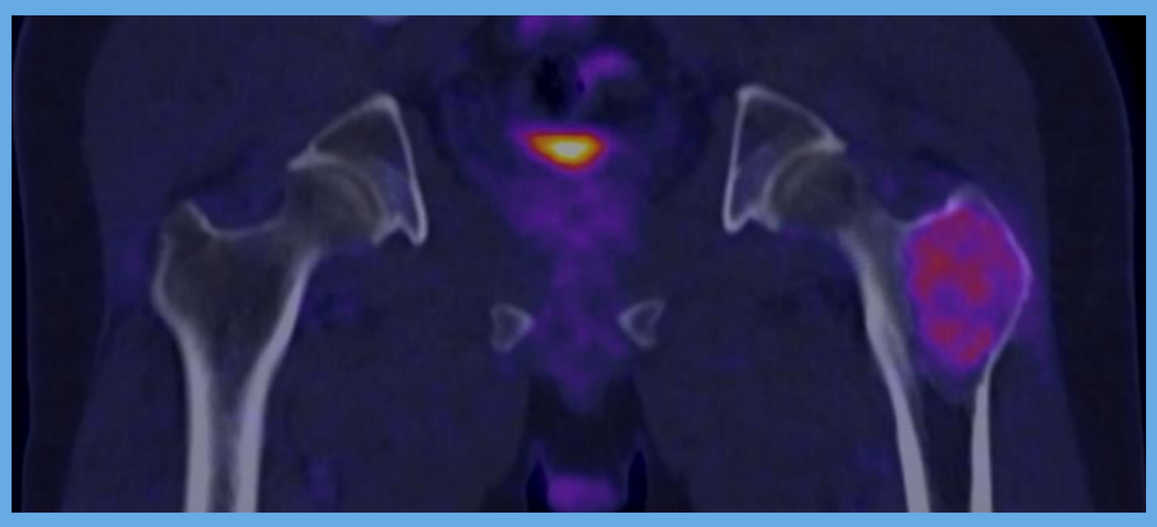

Fig.1: Initial PET- CT Record of the GCT from our index patient

MATERIALS AND METHODS

3 patients with biopsy proven diagnosis of GCTB (locations distal radius; proximal fibula; neck of the femur) received neoadjuvant XGEVA weekly over 30 days with 120 mg/injection. After completion of above XGEVA protocol, local treatment consisted in curettage and cement filling in 3 patients. In a 68 year old lady with GCTB of the distal radius the cement spacer was left in place and she is asymptomatic at 3 years F/U. In the other patients, the cement spacer was removed and the defect biologically reconstructed with autologous or homologous bone transplant.

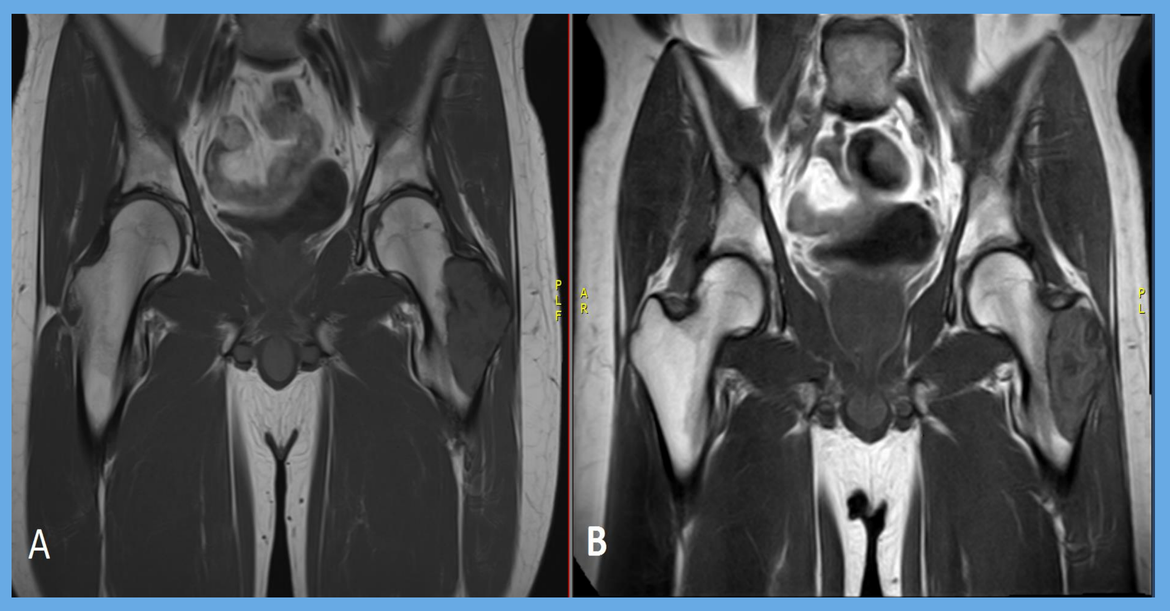

Fig. 2: *. MRI of the pelvis A shows the GCT in the left trochanteric region, B result after XGEVA*

RESULTS

A total of 3 patients were treated. The mean follow up was 48 months. 1 of the 3 cases showed no local or systemic recurrence. One case with recurrence of GCTB at the proximal fibula underwent a wide resection. Our index patient had a recurrence 3 years after initial treatment and underwent a second curettage with a local filling of palacos without preoperative usage of Denosumab.

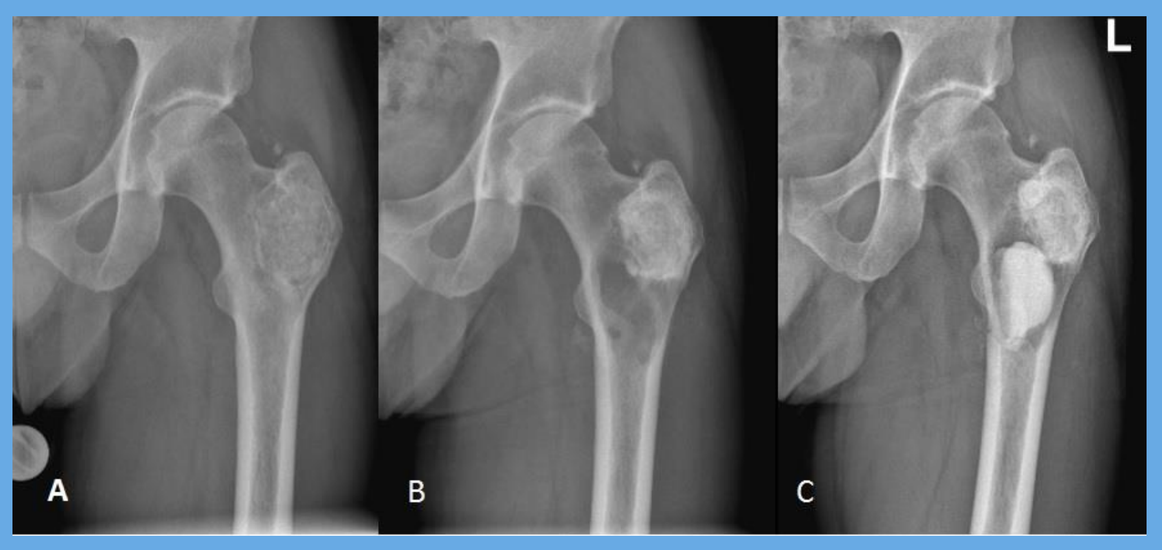

Fig. 3: A *2 years after initial therapy, B recurrence 3 years after initial surgery, C last control after revision surgery*

CONCLUSIONS

The short time application showed a satisfactory macroscopic re-modeling which made the curettage easier and enhanced the quality of tumor resection. Initially the results were encouraging unfortunately there are still recurrences. This shows the difficulty of treating GCT. Nevertheless we believe that a shorter application time of XGEVA is a sufficient treatment protocol.

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