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Management of Giant Cell Tumor (GCT) of Proximal Tibia in a Skeletally Immature Patient: A Rare Case Report.

Dr. Rajesh Sharma[1] , Dr. R.P. Meena[2]
[1][3rd year Orthopaedic Resident, Govt. Medical College, Kota (Rajasthan)]
[2]Professor & Unit Head, Department of Orthopaedics, Govt. Medical College, Kota (Rajasthan)]

Abstract:-Giant Cell Tumor (GCT) is a benign aggressive tumor of skeletally mature individuals with incidence peaking in third decade of life. In skeletally immature individuals giant cell tumor is extremely rare (<2%). More common in females and epi-metaphyseal location. Here we present a case of a four years old male child with pain and swelling proximal tibia left side, NCCT & MRI suggestive of giant cell tumor, was treated with excisional biopsy, curettage and void was filled with allograft, which was taken from mother's iliac crest. Sample sent for histopathology was consistent with diagnosis of giant cell tumor. Patient started weight bearing after 2 months postoperatively. No recurrence has been seen after 6 months of follow up.

Keywords:-Giant Cell Tumor, Proximal Tibia, Excisional Biopsy, Allograft.

I. INTRODUCTION

Cooper in1818 first described GCT of bones (1). Later Nelaton showed their local aggressiveness, and Virchow revealed their malignant potential.GCT is the bone tumor of skeletally mature individuals with peak incidence in third decade of life. It represents approximately 5% of all primary bone tumours (2,3). Incidence of GCT in children and adolescent is extremely rare (<2%), as a consequence, there is limited literature documenting the course of the disease in the immature skeleton (Campbell). It is a benign but locally aggressive tumor with <5% malignant potential. It may metastasize most commonly to the lungs (Campbell).It has female predominance and most commonly involves epiphysio-metaphyseal region of long bones.[distal femur*(m/c)* > proximal tibia > distal radius].Here we present a rare case of 4 years old male child with GCT left proximal tibia to evaluate the clinical efficacy of the mother's bone graft and radiological healing of the osteolytic lesion after intralesional curettage of GCT in skeletally immature individual.

II. CASE REPORT

Our patient was 4 years old male child, presented with pain and swelling left upper leg. His mother first noticed swelling while bathing her child 6 months ago but initially ignored it. After two months it again came into attention because of pain while walking. They attended Orthopaedic department,

New Hospital, Govt. Medical College, Kota and thoroughly investigated.

Routine blood investigations were within normal limit. X ray left knee joint shows eccentric lytic metaphyseal lesion of left upper tibia with partial physeal destruction. For more evaluation we advised NCCT left knee joint, interpretation was; proximal metaphyseal end of left tibia showing 65mm x 33mm expansile, lytic lesion with thinning of cortex and breach of cortex at few places suggestive of GCT [fig.1]. FNAC finding also suggestive of GCT. MRI done to see local invasion, interpretation was; T1 weighted MRI shows intense enhancement of metaphyseal lesion of proximal tibia with cortical break and extension into adjacent soft tissue.

Mother was tested for the presence of viral diseases and viral markers for hepatitis B, hepatitis C, and HIV were done. She was found to be negative for the presence of any disease.

We performed intralesional curettage and biopsy. The void was filled with allograft which was taken from mother's iliac crest. The surgery was conducted simultaneously in two tables, so that there was a minimum possible time gap between the graft harvestation and transplantation. Biopsy sample sent for histopathological examination for confirmation of diagnosis. Interpretation was: 'sheets of evenly distributed multinucleated giant cells (10-60 nuclei) in the background of benign stromal cells with mild to moderate atypia. Stromal cells infiltrating surrounding adipose tissues and skeletal muscles'. All these features suggestive of GCT.

Patient was immobilized by GT POP slab for 30 days [fig.2] and then non weight bearing mobilization was started[fig.3].Full weight bearing was allowed after two months [fig.4].

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Fig. [1]

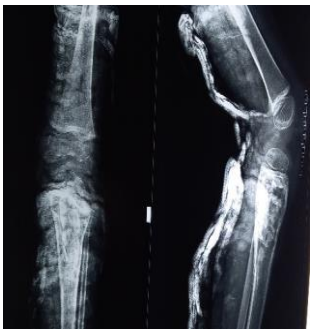

Fig. [2]

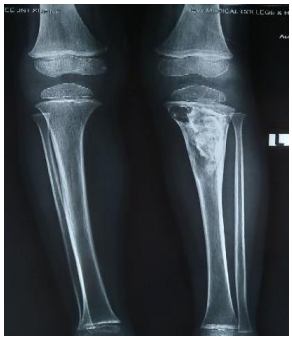

Fig. [3]

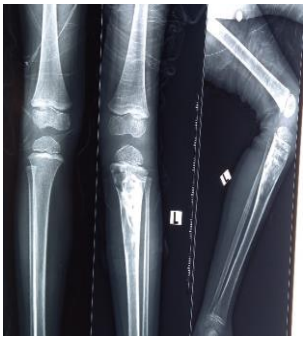

Fig. [4]

[Fig.(1) shows preoperative NCCT of left knee joint;fig.(2), fig.(3)& fig.(4) are digital skiagrams (anteroposterior and lateral views) showing postoperative follow-ups at 30 days with slab, at 30 days after removal of POP slab, and at two months respectively]

At present (6 months follow up) patient has pain free, mobile knee joint without clinical evidence of any soft tissue complications or distal neurovascular deficit. [fig.5-8]

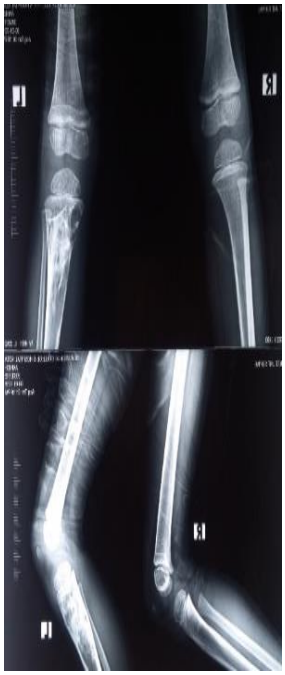

Fig. [5]

Fig. [6]

Fig. [7]

Fig. [8]

[Fig.(2) is Digital Skiagram Showing Anteroposterior and Lateral View At 6 Months Follow-Up Postoperatively;Fig.(6), fig.(7) &fig.(8) are Clinical Photographs at 6 Months Follow-Up Showing Sitting, Squatting And Cross-Leg Positions Respectively]

We did not observed any clinical or radiological evidence of recurrence. Though it is too early to comment on recurrence.

III. DISCUSSION

Peak incidence of GCT is in third decade of life. It is very rare in childhood (4).Our case is a male child, although most of the literature shows female predominance (5) in GCT, but others have found no difference between the genders [4].

The lesions of GCT in adults are located in the metaphyseo-epiphyses of long bones. In our case lesion is at metaphyses of proximal tibia. Goldenberg et al [6] reported that purely metaphyseal lesions were more common in young patients.

Different surgical methods are available ranging from intralesional curettage to arthrodesis of joint. But the consensus regarding selection of ideal treatment method is still in debate.We choose treatment modality as intralesional curettage, biopsy and allograft which was taken from mother's iliac crest, as our patient is quite young (4 years) and not suitable to obtain a sufficient amount of autograft. Fresh allogeneic bone (mother bone graft) elicits both acellular and humoral immune response. It helps in the development of enhancing factors that block the detectable immunity and probably protect the graft from rejection [7].

We didn't use phenol or liquid nitrogen as adjuvant treatment because of potential complications, such as pathological fracture, wound healing problems, and neurovascular injury (Campbell).

We didn't use implant for internal fixation to avoid growth plate/epiphyseal injury and implant associated complications.

Though bone cement is a good space filler, easy to identify recurrence and remainant tumor cells necrosis, but we avoid to use it because use of bone cement in subchondral area leads to cartilage damage and risk of subsequent osteoarthritis. In long term follow up, development of radiolucent line at bone-cement interface leads to cement loosening and stress fracture (Takuro wada et al 2002).

After curettage recurrence rate of GCT in adult population is 14–25% [8] and in younger patients it is between 8%-20% [9] within three years. In our case there is no evidence of any clinical or radiological features of recurrence after six months of follow-up, although it is too early to comment on recurrence and patient is still in follow-up.

IV. CONCLUSION

Intralesional curettage and allograft (mother bone graft) is a good alternative treatment modality for GCT in skeletally immature individuals with good functional and radiological outcome and less complications.

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