

CASE REPORT

FIBULA AND ILIAC BONE GRAFTING WITH INTERNAL FIXATION FOR GIANT CELL TUMOUR OF PROXIMAL TIBIA

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ABSTRACT: Middle aged old female with swelling in left knee suggestive of giant cell tumour was treated with excisional biopsy with curettage, phenol cauterisation, bone graft and proximal tibia locking plate fixation. Sample sent for histopathology was consistent with diagnosis of giant cell tumour. No recurrence has been seen after 1 year of follow up.

KEYWORDS: Bone graft, Giant cell tumour, proximal tibia, Excisional biopsy, phenol.

INTRODUCTION: Giant cell tumour of the bone accounts for 4-5% of primary bone tumours and 18.2% of benign bone tumours. Generally it occurs in the third to fourth decade of life.^[1] More common in females. Its activity ranges from borderline to malignant lesion. It is locally aggressive and destructive lesion. Tumour is notorious for high recurrence rates after excision. Since tumour has high recurrence rates, it is treated by combination of various modalities available to reduce the recurrence rates. It is characterized by the presence of multinucleated giant cells. The tumour is usually regarded as benign. In most patients, giant cell tumours have an indolent course, but tumours recur locally in as many as 50% of cases. Metastasis to the lungs may occur.^[2] Most common sites are proximal tibia, distal femur, and distal radius.^[3] Radiographically it seen as expansile exophytic mass. Cooper first reported giant cell tumours in the 18th century. In 1940, Jaffe and Lichtenstein defined giant cell tumour more strictly to distinguish it from other tumours. Giant cell tumour usually occurs de novo but also may occur as a rare complication of Paget disease of the bone.

CASE: A 32 years old female presented with history of pain and swelling in left knee for 3 months without preceding history of trauma to the knee joint. There was no history of fever, chest pain, other joint swelling. She had not taken any kind of treatment prior to presenting at our OPD. On examination there was a firm, tender, well defined swelling at the proximal lateral aspect of tibia around 6x6cms. There was crepitus and knee range of movement was normal. The distal neurovascular status was intact.



Fig. 1: clinical picture of swelling on lateral aspect of left proximal tibia

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On X Ray eccentric epiphyseal exophytic mass was seen in proximal aspect of left tibia. There was no joint invasion seen on x ray. Chest X Ray of the patient was normal. MRI (Fig-2) revealed 6x4cm multiloculated lytic mass on lateral aspect of proximal tibia.



Fig. 2: MRI film showing lytic mass on lateral aspect of proximal tibia

FNAC was done which showed presence of giant cells. Tumour was treated by excisional biopsy and curettage of the margins of lesion. Margins were cauterised using phenol. Resulting cavity that was formed was filled with bone graft (bilateral fibular strut graft and iliac graft) and proximal tibia locking plate was applied to lateral aspect of tibia.



Fig. 3: Clinical picture of giant cell tumour



Fig. 4: Intraoperative picture showing cavity formed being filled with bone graft and proximal tibia locking plate being applied to lateral aspect of tibia

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Sample was sent for histopathological examination. Microscopy was consistent with the diagnosis of giant cell tumour. Multinucleated giant cells with oval or round shaped stromal cells and oval or round, vesicular nuclei were seen.

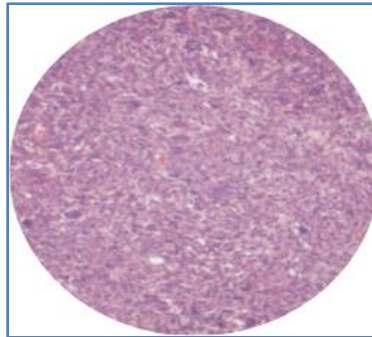


Fig. 5: Microscopic picture of giant cell tumour: showing multi nucleated giant cell and mono nuclear stromal cells

Post operatively patient was started on intravenous antibiotics for 5 days followed by oral antibiotics. There was no evidence of wound infection in postoperative period. Patient was discharged after suture removal.



Fig. 6: Post-operative x-rays of patient antero posterior and lateral view



Fig. 7: One year follow up X-Ray of patient antero posterior and lateral views

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DISCUSSION: Giant cell tumour of bone represent approximately 4–5% of the primary bone tumours and 20% of the benign bone tumours.^[3] In 70% cases, tumour involves women in 3rd or 4th decade of life.^[4,5] Tumour is primarily benign but has tendency to turn malignant. Tumour is notorious for recurrences.^[6,7,8] The tumour arises from the meta-epiphysis of long bone, grows as an expansile exophytic mass.^[4,5] Tumour is grey to reddish brown in colour and is composed of soft vascular friable tissue.^[4,9] Microscopically it consists of multinucleated giant cells scattered in vascularised network of proliferating round, oval or spindle shaped cells surrounded by indistinct cytoplasm.^[7,8] The nuclei of the multinucleated and mononuclear cells are similar. In fact, giant cells are circulating monocytes which were converted into osteoclasts.^[10] For this reason there are various modalities of treatment available for tumour to prevent the recurrences.^[7] Various modalities available for treatment are excision of tumour followed by curettage, wide local excision, burr drilling, other adjuvant therapies like phenol cauterisation, cryotherapy, intralesional chemotherapeutic agents like adriamycin or methotrexate.^[7,11] Resultant defect that is formed, is treated based on location and size of tumour. In case of distal ulna, proximal radius, proximal fibula, coccyx, sacrum resection of involved bone is performed.^[7,11,12,13] For distal femur, proximal tibia, distal radius bone cement or bone graft or combination is used. For larger tumours around knee joint reconstruction with technique like Turn o plasty is used.^[14,15] Cavity can be filled by bone cement or bone graft. Both methods has its own advantages and drawbacks. Advantages of bone cement are cement exerts thermal effect which kills cells, makes detection of recurrence easier and gives structural support and allows early weight bearing. Drawbacks are damage to articular cartilage when used in subchondral lesions and cement though strong in compression is weak when subjected to shear. Advantages of bone graft are it undergoes remodelling along stress lines and once incorporated reconstruction is permanent. Drawbacks are autograft quantity is limited, donor site morbidity, allograft is expensive and recurrence is difficult to identify. Some aggressive and recurrent tumours may require amputation. Adjuvant therapies are used to reduce recurrences. Chemotherapy and Radiotherapy is used for unresectable malignant tumour.^[16] Phenol cautery and cryotherapy kills malignant cells at the margin of tumour. Many authors have reported good function of joints after the combined use of curettage and chemical cauterization in the treatment of GCT of bone adjacent to major joints.^[17-21] Thorough curettage of the tumour and elimination of the remaining cells with an adjuvant are essential for the surgical treatment of GCT of bone. The tumour often extends into the surrounding normal bone and meticulous treatment of the wall of the cavity using 50% aqueous zinc chloride is required to destroy the remaining cells and thus to reduce the rate of local recurrence.^[22] Some authors have attempted tumour resection and arthroplasty reconstruction using prostheses after tumour excision, but the results were poor.^[23]

CONCLUSION: Giant cell tumours of bone are commonly benign but locally destructive lesion. The main primary treatment of GCT is surgery and depends on preoperative evaluation which includes clinical evaluation that involves the site and size of the tumour in relation to surrounding structures, together with plain X-ray, CT scan and/or MRI as indicated and tissue biopsy to define tumour grade. Curettage alone results in high rate of local recurrence. Whereas curettage along with adjuvant procedure like burr drilling, phenol cauterisation, cryosurgery, argon beam etc.

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using bone cement or bone grafts as filler gives low rate of local recurrence. Resection is recommended for stages IB and IIB, extremely large lesions, and in cases where resection results in no significant morbidity as proximal fibula and flat bones. Amputation is preserved for massive recurrences and malignant transformation.

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