

Giant Cell Tumour of Distal Fibula Managed by En Block Resection and Reconstruction with Ipsilateral Proximal Fibula.

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What to Learn from this Article?

Rare site of giant cell tumor and its management

Abstract

Introduction: Giant cell tumour is the commonest benign bone tumour arising at the epiphyseometaphyseal regions of long bones. Around the knee is commonest site followed by distal radius. A giant cell tumour of the distal fibula is extremely rare. We report here a case of giant cell tumour of distal fibula. There are very few similar cases reported worldwide and it is the purpose of this report to describe the management of such a case.

Case Report: A 17 year old girl presented with swelling of ankle and pain while walking for six months. Radiographs were suggestive of a giant cell tumour, computerised tomography revealed cortical break, en block resection was done with ipsilateral proximal fibula used in reconstruction of ankle mortise.

Conclusion: Giant cell tumour of long bones are common but those involving the distal fibula are exceedingly rare. The management of such tumours with high recurrence rates can be easily accomplished by en block resection and reconstruction of the ankle mortise with proximal fibula ensuring good range of motion of the joint post operatively.

Keywords: Distal fibula; giant cell tumour; ankle reconstruction.

Introduction

First described by sir Astley cooper in the year 1818, giant cell tumour of bone or osteoclastoma is the commonest benign bone tumour encountered by an orthopaedic surgeon. It is characterised radiographically as a lytic lesion occurring in the ends of bones and has well known propensity for local recurrence after surgical management. Current treatment modalities including a meticulous curettage with extension of tumour removal using high speed burrs and adjuvant local therapy has significantly lowered the recurrence rates to less than 10% from 60% in the past with curettage alone. It typically involves the epiphyseometaphyseal region of long bones. The commonest age is the 3rd or the 4th decade with a slight female predominance. The knee is the commonest site

followed by distal radius. The other less common infrequent sites are sacrum, distal tibia, proximal humerus, proximal femur and proximal fibula [1]. Involvement of distal fibula by benign aggressive and malignant tumors usually necessitates resection of the involved segment of fibula [2]. The incidence of giant cell tumour of distal fibula was found to be less than 1% of 1182 cases [3]. Schajowicz, in his series of 362 cases has reported only a single case affecting the lower end of the fibula (0.28%)[4].

Case Report

A seventeen year old girl presented with swelling around the right ankle for six months associated with pain while walking and restriction on squatting. There was no significant contributing history.

Author's Photo Gallery



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On examination the swelling was six by four by two centimetres in size, firm to hard in consistency, no tenderness on deep palpation. [Fig 1]

Anteroposterior and lateral radiographs were taken which showed single epiphyseal expansile lesion with soap bubble appearance. [Fig 1] Computerised tomography scan revealed cortical break medially. Magnetic resonance imaging could not be done as the facility was not available then in our



Figure 1: Clinical picture showing swelling and radiographs showing expansile lesion with soap bubble appearance.

government hospital and patient's financial background prevented us getting an imaging from private centres. Fine needle aspiration cytology of the swelling was found to be inconclusive. All routine haematological investigations were found to be normal and chest radiograph was also found to be normal. An excisional biopsy was planned with reconstruction using the proximal end of the ipsilateral fibula. Under pneumatic tourniquet without exsanguination an en bloc excision of the lateral malleolus with lower third of the fibula was carried out through a lateral incision. The level of resection of distal fibula was determined by the computerised tomography, clinical intra operative findings and by pre operative radiographs. We resected distal fibula 3 centimetres

above the lesion. An adequate length of proximal fibula was resected extra periosteally [Fig 2]. The proximal fibula was reversed with head of fibula incorporating into the ankle mortise and fixed to the remaining fibula using plate and screws. [Fig4]. The transposed fibula was fixed to the distal tibia with a syndesmotic screw. Lateral ligament complex sutured. Meticulous haemostasis was achieved after release of the tourniquet, and the wounds were closed in layers. Histopathological examination confirmed giant cell tumour. [Fig 2d]. Post operative radiographs were taken [Figs 2c]. Patient kept non weight bearing for three months and full weight bearing at six months after the removal of screws. Radiographs were repeated after six months [Fig 3]. Patient was followed up and at the end of one year patient had full range of motions with mild restriction of dorsiflexion of the affected ankle [Figs 3].

Discussion

The proximal fibula can be sacrificed for the purposes of reconstruction as is recommended for lower end fibula and distal radius[5]. Giant cell tumour of the bone has an unpredictable behaviour, not always related to radiographic or histological appearance[6]. This makes the treatment of the disease a subject of constant debate. The best treatment should ensure local control of disease and maintain function. Curettage has been the preferred treatment for most cases of GCT. Many earlier studies had shown very high local recurrence rates after curettage and bone grafting[7]. The use of modern imaging techniques and extended curettage through the use of power burrs and local adjuvants have improved outcome with reduced recurrence rates. Phenol, liquid nitrogen, bone cement, hydrogen peroxide, zinc chloride and more recently, argon beam cauterization have been employed as local adjuvants. Chemical or physical agents work by inducing an additional circumferential area of necrosis to extend the curettage[8]. In distal fibular resection without reconstruction, the stabilising effect of the lateral malleolus is lost[9]. Soft-tissue reinforcement, even when it is possible, cannot fully compensate for the loss of stability. Resection of the lateral

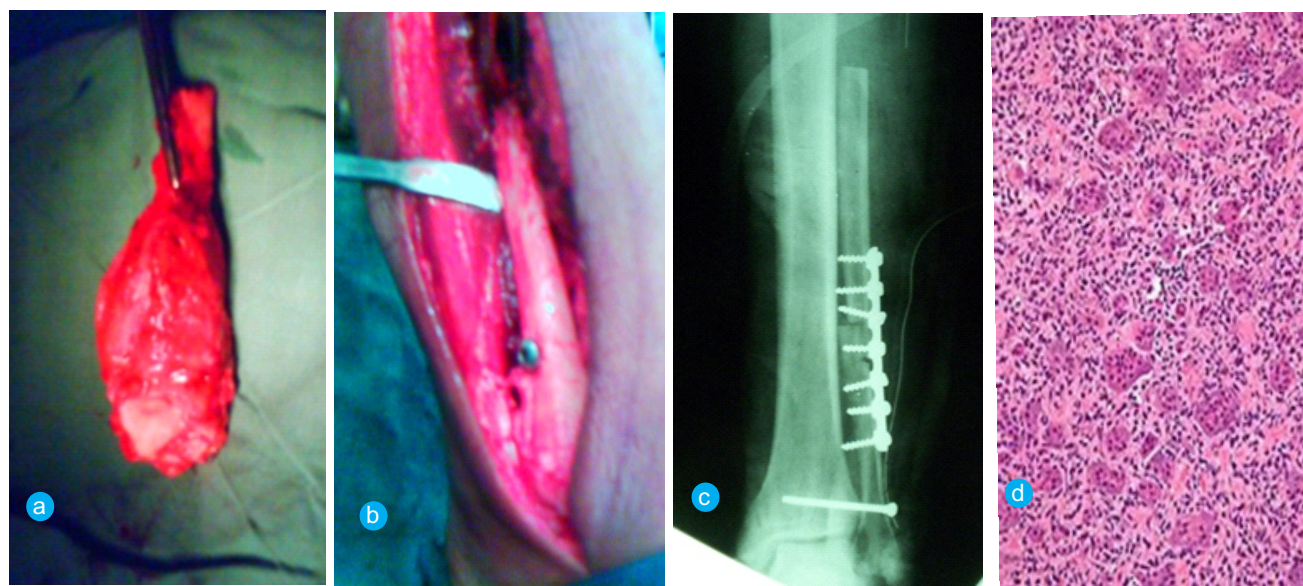


Figure 2: Distal fibula resected specimen intra operatively. b- fixation of the reversed proximal end of fibula and incorporation into the ankle mortise. c- Post operative radiograph showing good ankle mortise. d- Photomicrograph of the specimen showing multinucleate giant cells suggestive of giant cell tumor

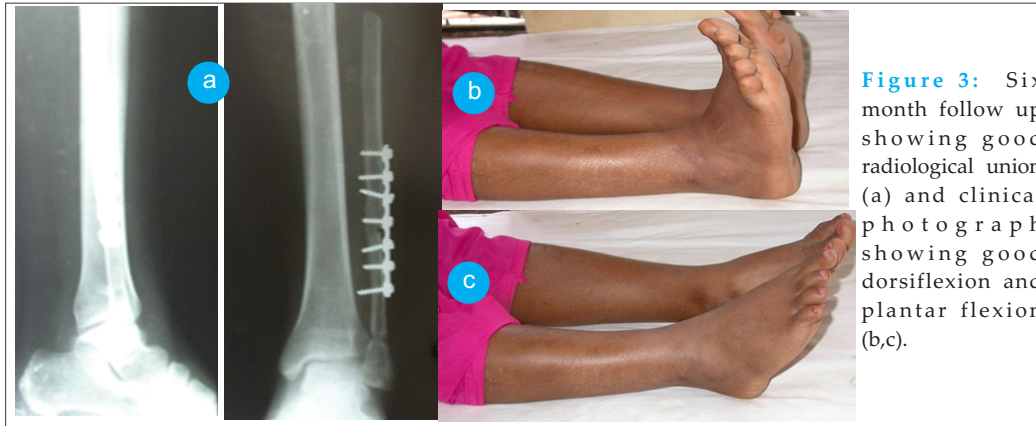


Figure 3: Six month follow up showing good radiological union (a) and clinical photograph showing good dorsiflexion and plantar flexion (b,c).

reconstruction of the ankle mortise with proximal fibula ensuring good range of motion of the joint post operatively. Resection arthrodesis which was the method primarily employed for bone tumours involving ankle can now be replaced with ankle reconstruction. Distal fibula GCT being an extremely rare entity and its management not been described, reconstruction of ankle with proximal

ankle can cause a varus instability or a collapse into valgus[10]. Resection arthrodesis and ankle reconstruction are the options available after resection of distal fibula. Arthrodesis of ankle changes the gait pattern and restricts ankle movements completely. Thereby ankle reconstruction provides stable and a mobile joint. Resection and reconstruction provides good oncological clearance and better functional outcome. This technique of ankle resection and reconstruction has provided good oncological and functional results and recommended in young active patients requiring resection of distal fibula[11].

Conclusion

Giant cell tumour of long bones are common but those involving the distal fibula are exceedingly rare. The management of such tumours with high recurrence rates can be easily accomplished by en block resection and

fibula provides the ideal treatment.

Clinical Message

Giant cell tumour of distal fibula are extremely rare and such benign tumours with high recurrence rates with the evidence of medial cortical break should be managed by an en block resection and reconstruction of the ankle mortise and the preferable method would be by the usage of proximal fibula graft. Reconstruction aided by plates and screws including syndesmosis fixation. This method produced no recurrence and ensured good range of motions and can effectively replace resection arthrodesis as management in cases which require resection of lateral malleolus.

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