Reconstruction of Ankle Mortise following Resection of Giant Cell Tumor of Distal Fibula

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Abstract

Introduction: Giant cell tumor commonly occurs in the age group of 20-40 years with the commonest predilection around the knee joint. This case is presented here for its rare occurrence in the distal fibula and its unique management.

Case report: 25 year old male patient presented with complaints of pain and swelling over the outer aspect of left ankle for one year. On examination there was a diffuse swelling over distal third fibula with classical egg shell cracking consistency. Imaging with X ray, Computed tomography (CT) and Magnetic resonance imaging (MRI) revealed eccentric, expansive, lytic lesion with cortical breech. Thus a preoperative diagnosis of Giant Cell tumor(GCT) was made. Chest X ray and CT Chest were normal. Trucut Biopsy revealed features suggestive of Giant Cell Tumor. Locally aggressive tumor in an expendable bone warrants resection of distal fibula to prevent recurrence, which compromises ankle stability. So we did wide resection of the distal fibula and reconstruction of the ankle mortise with ipsilateral proximal fibula. Biceps femoris tendon and fibular collateral ligament were secured with suture anchor to lateral proximal tibia to avoid knee instability. Excision biopsy revealed giant cell tumor with margins free of tumor invasion. At one year follow up, there is no recurrence locally and patient walks without any support with normal knee and ankle range of movements. There is no lateral opening of knee joint on varus stress test with knee in 30 degree flexion. Mean musculoskeletal tumor society (MSTS) score was 100%.

Conclusion: Giant cell tumor involving distal fibula is very rare. Owing to high recurrence rate, resection of tumour in toto and to enable the patient with good ankle stability, reconstruction of ankle mortise with ipsilateral proximal fibula is an appropriate mode of management especially in young patients.

Keywords: GCT, Distal Fibula, Resection and Reconstruction with Proximal Fibula

Introduction: The incidence of Giant cell tumors is 4%, affecting the meta-epiphyseal region of long bones, with commonest involvement being around the knee joint [1]. It commonly occurs in patients around 20 to 40 years of age with slight female predilection. Giant cell tumor involving distal fibula is very rare, whose incidence is less than 1% [2]. Locally aggressive lesion in such an expendable bone needs resection of the involved bone, which compromises ankle stability, particularly in young patients [3]. This case is being presented here for its rare involvement and its unique management using an innovative technique, where tumor is resected and ankle mortise is reconstructed with ipsilateral proximal fibula. Lateral knee stability is restored by incorporating biceps femoris and fibular collateral ligament to lateral proximal tibia with suture anchor [4].

Case report: 25 yrs male pt came to our hospital with complaints of pain and swelling over the outer aspect of left ankle for 12 months. On clinical examination there was a diffuse swelling over distal third fibula with classical egg shell cracking consistency on palpation [Fig. 1]. Imaging with X ray, CT and MRI revealed eccentric, expansive, lytic lesion with cortical breech [Fig. 2]. Thus a preoperative diagnosis of Giant Cell tumor was made. Chest X ray and CT Chest were normal. Trucut Biopsy was done, which revealed features suggestive of Giant Cell Tumor [Fig. 3]. Locally aggressive tumor in an expendable bone needs resection of distal fibula to prevent recurrence, which compromises ankle stability. So wide resection of the distal fibula was done [Fig. 4]. Proximal fibula is harvested after careful dissection and isolation of common peroneal nerve [Fig. 5]. Biceps femoris tendon and fibular collateral ligament were secured with suture anchor to lateral proximal tibia to avoid lateral knee instability. Finally, ankle mortise is reconstructed with ipsilateral proximal fibula after reversing it so that fibular head acts as valgus stabiliser and fixed to the middle third intact fibula with 3.5 dynamic...
Syndesmotic screw is used to secure the reversed fibula for additional stability.

Remnants of lateral collateral ligament and biceps femoris were sutured to the lateral capsule of ankle joint. Immediate postoperative X-ray shows good tumor clearance [Fig. 7]. Excision biopsy revealed Giant cell tumor with margins free of tumor invasion [Fig. 8]. Patient was mobilised non weight bearing for 12 weeks. Syndesmotic screw was removed at 12 weeks and gradually allowed to bear full weight. At one year follow up, there is no recurrence locally [Fig. 9]. Patient walks without any support and on varus stress test with knee in 30° flexion, there is no lateral opening of knee joint. His knee and ankle range of movements were normal [Fig. 10]. Mean musculoskeletal tumor society score (MSTS) was 100% [5].

Discussion:

Locally aggressive Giant cell tumors should be managed effectively to prevent recurrence [6]. Extended Curettage is a good option, but in such aggressive lesions, it is often risky, because radiological findings often differ from that of intraoperative findings where there will be a thin shell of cortex which cannot be

**IMPRESSSION:**

*Excision biopsy Distal fibula - Epiphysial tumor 7 x 7 x 4cm with features of Giant cell tumor Bone invading the adjacent connective tissue.*

*Separately sent skin free of tumor infiltration.*

*Proximal bone margin free of tumor infiltration.*
reconstructed adequately [7]. Resection in toto gives excellent clearance and recurrence is less common. Following fibular resection, ankle stability is compromised [3]. Valgus deformity will ensue, leading subsequently to Arthritis [8]. Though arthrodesis is a good option, gait pattern will be affected and it was withheld as this patient is very young. Hence, reconstructing the ankle mortise following wide resection is advisable to prevent ankle instability. Vaishya et al incorporated tricortical iliac crest bone graft following resection of tumour in toto and to enable reconstruction with Fibular allograft with wide resection of the tumor to prevent recurrence and reconstructed with Autograft from ipsilateral proximal fibula to restore the ankle mortise. Careful dissection was carried out to protect the common peroneal nerve and the lateral stabilisers were secured to the lateral proximal tibia.

Capanna et al reviewed 11 patients with distal fibula tumors, where resection and reconstruction was done by different methods, giving satisfactory results [10]. Reconstruction with Fibular allograft following resection will be an appropriate option, but bone bank facility is not available in our centre [11]. Carrell’s technique of reversing the proximal fibula after resection of distal fibula to restore the ankle mortise has been described [12]. The proximity of common peroneal nerve around the neck of fibula and the attachment of biceps femoris and fibular collateral ligament to the fibular head has to be addressed during graft harvest which makes the procedure complicated [13]. Considering these issues, we went ahead with wide resection of the tumor to prevent recurrence and reconstructed with Autograft from ipsilateral proximal fibula to restore the ankle mortise. Careful dissection was carried out to protect the common peroneal nerve and the lateral stabilisers were secured to the lateral proximal tibia.

Conclusion:
Giant cell tumor involving distal fibula is very rare. Owing to high recurrence rate, resection of tumour in toto and to enable the patient with good ankle stability, reconstruction of ankle mortise with ipsilateral proximal fibula and securing biceps femoris and fibular collateral ligament with suture anchor to lateral proximal tibia for lateral knee stability is an appropriate mode of management especially in young patients.

References


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