Case Report

En Bloc Resection of Osteoid Osteoma in the Medial Aspect of the Distal Femur (Right) Using Mid-vastus Approach with Allograft Reconstruction: A Case Report

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ABSTRACT

A 48-year-old male presented with persistent localized pain in the medial aspect of the distal femur (Right)). Diagnosed was established with clinical history examination , Xray, CT and bone scanning along with hematological investigations, as osteoid osteoma. En bloc resection was performed using the mid-vastus approach under spinal anaesthesia. Intraoperative localization of the nidus was achieved through chiseling and macroscopic findings of thickened cortical bone with a small lytic area within thickened bone, and marking the nidus with a K-wire, reconfirmed by C-arm fluoroscopy. An en-block excision of the cortical bone including the nidus was performed with a 7 mm bone biopsy trephine. The bone gap was filled using a cortico-cancellous allograft. Histopathological findings confirmed the diagnosis. The patient had an uneventful postoperative recovery with complete symptom resolution.

Keywords: *Osteoid Osteoma, En Bloc Resection, Allograft Reconstruction.*

INTRODUCTION

Osteoid osteoma, a benign osteoblastic tumor, accounts for 10–12% of all benign bone tumors and predominantly affects individuals aged 10–35 years[1]. It typically presents as localized pain, worsens at night, and is alleviated by NSAIDs. Long bones such as the femur and tibia are the most common sites, though involvement of the distal femur, especially on the medial aspect, is relatively uncommon[2].

Surgical excision remains the treatment of choice for symptomatic lesions, particularly in anatomically challenging locations where alternative techniques such as CT-guided radiofrequency ablation may not be feasible[3]. This case highlights the management of a distal femoral osteoid osteoma using the mid-vastus approach for en bloc resection and subsequent reconstruction with an allograft.

CASE PRESENTATION

48-year-old male came with localized pain in the medial aspect of the right distal femur for 8 months, aggravated at night and relieved by NSAIDs. No history of trauma or systemic illness noted. The pain interfered with his daily activities. Tenderness was localized to the medial distal femur. No visible swelling or deformity noted. Pain exacerbated deep palpation and terminal knee flexion. On X-ray: Radiolucent nidus with surrounding sclerotic bone

is seen. The nidus was subsequently confirmed via CT scan, measuring <1.5 cm located in the medial distal femoral cortex with adjacent sclerosis. A Isotope Bone scan was done, which demonstrated an increase in the tracer uptake in the same tumor area (shown in figure 1).

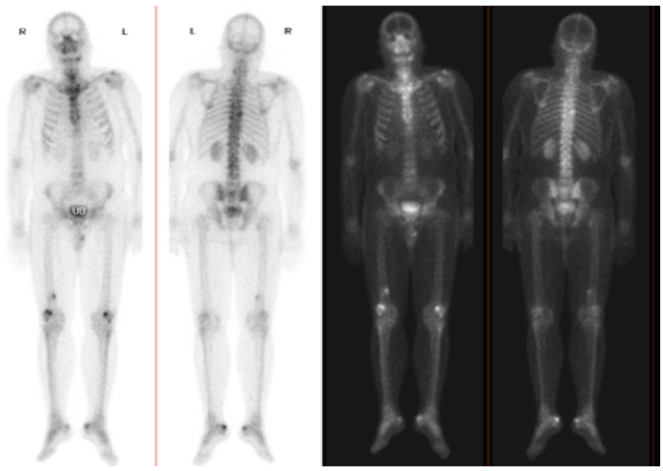

Figure 1: Bone scan showing increase uptake in the tumor region.

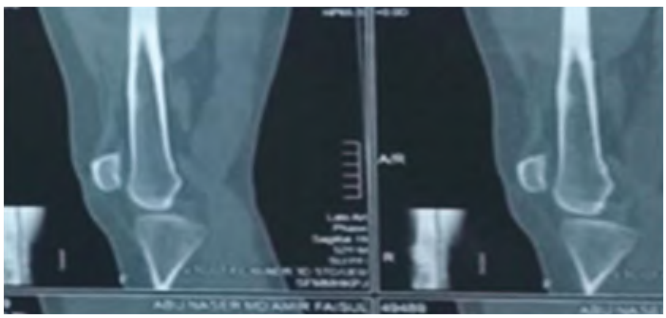

Figure 2: showing the nidus with surrounding cortical sclerosis

Preoperative CT imaging delineated the lesion's size and location (Showing in figure 2). The mid-vastus approach was chosen for direct access while preserving soft tissue structures. The localization techniques included intraoperative chiseling, K-wire marking, and C-arm fluoroscopy for confirmation.

The patient was supine under spinal anesthesia with a tourniquet applied to the left thigh. A medial parapatellar incision was made, and the distal femur was accessed using the mid-vastus approach (shown in figure 3). Palpation and chiseling identified the suspected nidus site. A K-wire was inserted for marking (shown in figure 4), and C-arm fluoroscopy reconfirmed the nidus location (shown in picture 5). En bloc excision of the nidus and surrounding sclerotic bone (shown in picture 6). The resultant defect (~2.5 cm) was reconstructed using a cortico-cancellous allograft to restore bone continuity. Layered closure of the vastus medialis and skin incision.

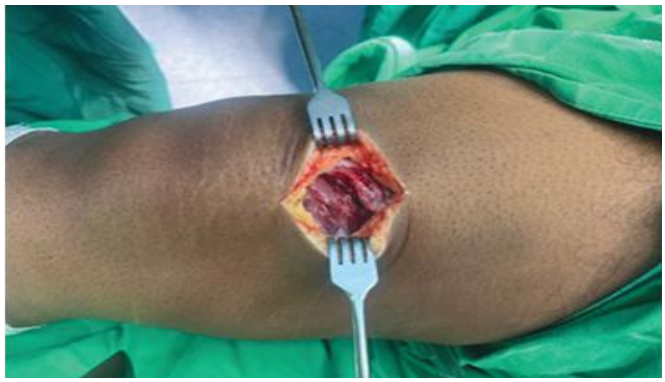

Figure 3:Per-operative picture showing the exposure of the area by a mid-vastus space

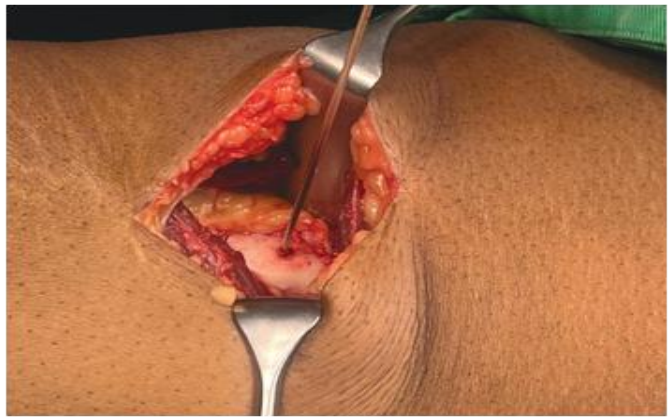

Figure 4:Per-operative picture showing K-wire which was inserted for marking

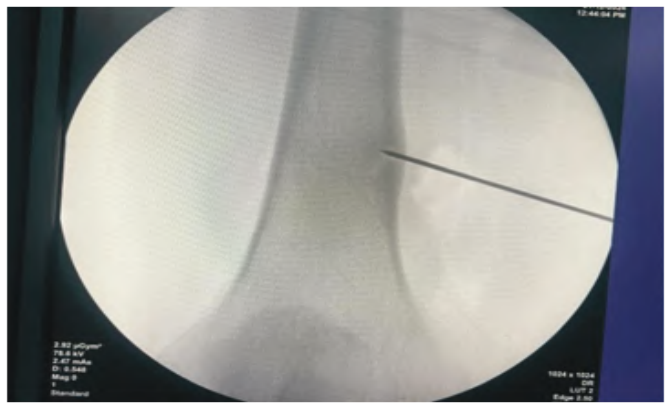

Figure 5: C-arm fluoroscopy showing the nidus location.

Figure 6: Per-operative picture showing en-block resected tumor

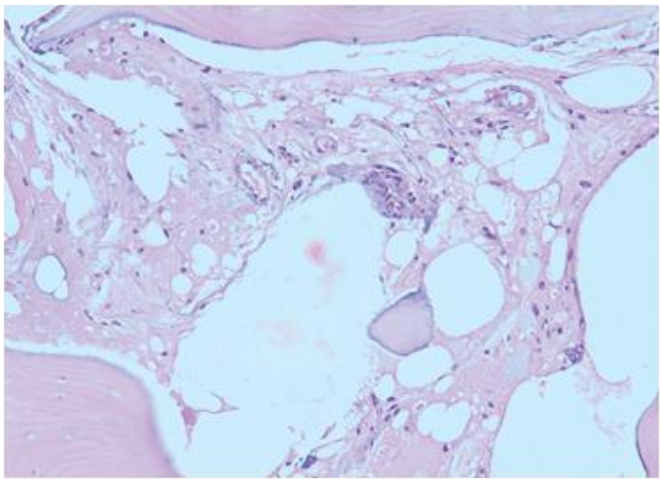

Figure 7.A: histopathology picture showing nidus of osteoid material with surrounding reactive sclerotic bone

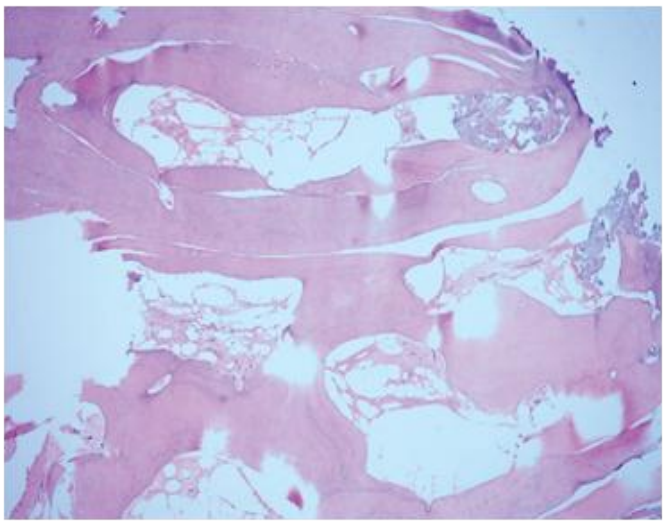

Figure 7B: histopathology picture showing nidus of osteoid material with surrounding reactive sclerotic bone

On histopathological analysis, the excised specimen showed a nidus of osteoid material with surrounding reactive sclerotic bone, confirming osteoid osteoma[4] (showing in figure 7 A&B). After Surgery, Immediate pain relief was noted postoperatively. Partial weight-bearing began at 2 weeks, transitioning to full weight-bearing at 6 weeks following radiological confirmation of graft stability. Physiotherapy focused on a range of motion exercises and quadriceps strengthening. The patient was asymptomatic at 6 months follow-up, with no recurrence and full functional recovery.

DISCUSSION

Osteoid osteoma is a rare benign tumor characterized by a nidus of osteoid tissue surrounded by reactive sclerotic bone[5]. The medial aspect of the distal femur is an uncommon site, which poses challenges in terms of accessibility and reconstruction due to its weight-bearing role and proximity to vital structures. Accurate localization is crucial for complete resection of the nidus while minimizing unnecessary bone removal[6]. In this case, chiseling allowed initial identification of the nidus, while K-wire marking and C-arm fluoroscopy ensured precise excision. These techniques are particularly important in areas where the nidus is obscured by reactive sclerosis. The mid-vastus approach provided optimal access to the medial distal femur while preserving the extensor mechanism and minimizing soft tissue damage[7]. This approach is less invasive compared to traditional medial approaches, with reduced postoperative morbidity. Cortico-cancellous allografts are commonly used to reconstruct defects after tumor excision in weight-bearing bones[8]. They provide immediate structural support and facilitate integration with the host bone, as observed in this case. Minimally invasive techniques such as CT-guided radiofrequency ablation (RFA) are effective for smaller lesions in accessible locations. However, for larger or anatomically challenging lesions, surgical excision remains the gold standard[9]. This case demonstrates that meticulous surgical planning, precise localization, and appropriate reconstruction can yield excellent outcomes, even in challenging locations like the distal femur.

CONCLUSION

En bloc resection of osteoid osteoma using the mid-vastus approach is an effective treatment for lesions in the medial distal femur. Intraoperative localization using chiseling, K-wire marking, and C-arm fluoroscopy ensures accurate nidus removal. Reconstruction with cortico-cancellous allografts restores structural stability and enables functional recovery.

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