

## Prophylactic Internal Fixation in Tumors of Long Bones: Two Case Reports

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### Abstract

Internal fixation for long bone tumors is still a debatable topic. Approximately 75% of children present with pathological fracture in case of unicameral bone cyst and osteoid osteoma. We report a case of unicameral bone cyst of neck of femur and another case of osteoid osteoma at distal end of fibula wherein both the cases underwent bone curettage and prophylactic internal fixation. After 3 months of follow up both the patients are having full range of movements of the affected joint and are walking full weight bearing, Five year follow up, No recurrence, Prophylactic internal fixation showed good results and can prevent pathological fracture in future in bone tumors.

**Keywords:** Unicameral Bone Cyst; Osteoid Osteoma; Prophylactic Internal Fixation; Pathological Fracture.

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### Introduction

Simple, or unicameral, bone cysts are a benign lesion in growing children. Cysts are more common in males (70%) and typically present in the proximal humerus (70%) or femur (25%). While exact figures are unknown, it is estimated that approximately 75% of children present with pathological fracture [1]. Cysts heal in less than 15% of children following fracture [2]. Although unicameral bone cysts are believed to resolve with skeletal maturity, without treatment these children are at risk for pain, or recurrent fracture leading to activity restriction for many years.

Osteoid osteoma is a relatively common bone tumor, accounting for approximately one tenth of all symptomatic benign bone tumors and 5% of all primary bone tumors. Osteoid osteoma is generally a condition of the young, but it can affect a wide range of individuals aged 8 months to 70 years. The literature reports that people aged 10-30 years are

most susceptible. Men are affected more frequently than women. The lower extremities are the most common sites of osteoid osteomas. The femur, particularly the intertrochanteric or intracapsular regions of the hip, is affected in two thirds of cases [3]. The diaphyseal part of the tibia and the humerus are other common sites.

Recurrent pathological fractures in children with unicameral bone cysts and osteoid osteoma require immobilization, and/or internal fixation, and restriction of activities. Recurrent fractures, particularly in the lower limb, may also cause limb length discrepancy and deformity. In addition, children are often afraid of their usual play activities or are restricted from all sporting activities by their parents or physician because of the concern of fracture(s). Finally, some children with unhealed cysts complain of pain [4]. Although the origin of this pain is unclear, the pain seems to resolve with the healing of the cyst. Thus despite the benign nature of these lesions, unicameral bone cyst and osteoid

osteoma can have significant detrimental effects on otherwise normal children and their families.

Prophylactic internal fixation is routinely not done but can prove as a better treatment option in many bone tumors.

### Case Report 1:

We report a case of 11 year old boy presented with complaints of pain and swelling at the right hip. There was no history of trauma. On local examination tenderness was present at right hip and range of movements of the right hip joint were restricted and painful. Radiography revealed a lytic lesion involving neck of the femur (Figure 1). After obtaining fitness, patient was taken to surgery, where the cavity was curetted and Internal Fixation using 3 Titanium Elastic Nail System was done (Figure 2). Tissue with affected bone was sent for Histopathological evaluation which was reported as unicameral bone cyst. Post operation partial weight-bearing was allowed. After 3 month of follow-up, the patient is walking unsupported, able to squat (figure 3) with full range of movements (figure 4) and there is no pain, and the radiograph shows complete obliteration of the cavity.



Fig. 1: Plain X-ray AP view of pelvis with bilateral hip showing a lytic lesion in the neck of right femur suggestive of unicameral bone cyst.



Fig. 2: Post-operative Plain X-ray AP and Lateral view of right femur showing TENS in situ



Fig. 3: Showing patient is able to squat completely



Fig. 4: Showing patient is able to perform full range of movements of the right hip joint.

### Case Report 2

A 13 year old boy presenting with complaints of pain and swelling over lateral aspect of right lower leg. There was a history of injury to school bench. On local examination tenderness was present at right distal leg lateral aspect and range of movements of the right ankle joint were restricted and painful. Radiography revealed a lytic lesion with nidus in cavity involving the right lateral malleolus (Figure 5). After obtaining fitness, patient was taken to surgery, where the cavity was curetted and Internal Fixation using semi tubular plate was done (Figure 6). Tissue was sent for histopathological evaluation which reported as osteoid osteoma. Post operation partial weight-bearing was allowed. After 3 month of follow-up, the patient is walking unsupported, there is full range of movement at the ankle joint, there is no pain, and the radiograph shows complete obliteration of the cavity. Follow after 5 years – no recurrence .



**Fig. 5:** Plain X-ray AP and Lateral view of distal tibia and fibula showing osteoid osteoma (arrow) in distal third of fibula.



**Fig. 6:** Postoperative X-ray AP and Lateral view of distal tibia and fibula after excision of lesion and internal fixation with semi tubular plate .

## Discussion

Traditional methods of treatment for Unicameral Bone Cysts have included observation, open curettage and bone grafting, and steroid injections. Some techniques have integrated cyst decompression as a treatment [5]. Additionally, some techniques have begun to use bone graft substitutes such as demineralized bone matrix to fill benign bone defects [6]. Treatment of UBCs is difficult, and recurrence is frequent, regardless of the method used. Given this high recurrence rate, indications for surgical intervention generally are limited to critical weight bearing areas or to prevent an impending pathologic fracture. In our patient, we performed a prophylactic internal fixation using TENS. However, regardless

of surgical technique, recurrence of UBCs is common [7].

The diagnosis of an osteoid osteoma is usually based on clinical and radiographic findings. Conventional radiographs can show the nidus as a small lytic spot surrounded by a radiolucent ring. However, about a quarter of osteoid osteomas are not detected on plain radiographs alone. In such cases, CT, bone scintigraphy, magnetic resonance imaging and angiography are useful in making the correct diagnosis [8]. Surgical treatment including excision of the nidus is usually curative, and is the treatment of choice. Recently, minimally invasive techniques, such as percutaneous trephine or drill resection, with or without the subsequent injection of ethanol and thermal destruction with laser photocoagulation or radiofrequency ablation, have been used for the removal or destruction of the nidus [9]. Prophylactic internal fixation as done in our study prevents the chances of pathological fracture in future and hence is a safe technique.

## Conclusion

In our study, prophylactic internal fixation showed good results and can prevent pathological fracture in future in bone tumors.

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