

Osteoid Osteoma of the Humerus: A Rare Case Report and Review of the Literature

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Abstract

Case Report

Background: Osteoid osteoma is a benign bone tumor commonly affecting young adults, with the femur and tibia being the most frequent sites. Humeral involvement is uncommon and may lead to delayed diagnosis. **Case Presentation:** A 30-year-old man presented with severe nocturnal pain in the distal third of the left arm for one year, causing significant sleep disturbance. The pain persisted despite analgesics and nonsteroidal anti-inflammatory drugs but was markedly relieved by aspirin. Radiographs showed a cortical radiolucent nidus with surrounding sclerosis, and CT confirmed an osteoid osteoma of the distal humerus. The lesion was completely excised under fluoroscopic guidance using a high-speed burr, and the cortical defect was filled with an autologous cancellous bone graft. Histopathology confirmed the diagnosis. Complete pain relief was achieved from the first postoperative day, with no functional impairment or recurrence during follow-up. **Discussion:** Humeral osteoid osteoma is uncommon and can be overlooked because of its atypical location. Recognition of characteristic nocturnal pain and identification of the nidus on CT are essential for diagnosis. Although minimally invasive techniques such as radiofrequency ablation are increasingly used, open excision remains an effective option for accessible lesions, allowing complete removal and histological confirmation with excellent clinical outcomes.

Keywords: Osteoid osteoma; Humerus; Nidus; Nocturnal pain; Computed tomography; Surgical excision.

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INTRODUCTION

Osteoid osteoma (OO) is a common benign bone tumor accounting for approximately 10–12% of all benign bone tumors. [1] It typically affects children and young adults and is characterized by nocturnal pain that is markedly relieved by nonsteroidal anti-inflammatory drugs. Although the femur and tibia are the most frequently involved sites, humeral involvement is uncommon, representing only 19–31% of upper-limb osteoid osteomas. This unusual location may lead to delayed diagnosis because of its nonspecific clinical presentation. [2] We report the case of a 30-year-old man with an osteoid osteoma of the left humerus presenting with severe nocturnal pain causing sleep disturbance for one year. The patient was successfully treated by complete surgical excision, with complete resolution of symptoms.

CASE PRESENTATION

A 30-year-old man presented to our department with a one-year history of severe, persistent pain localized to the distal third of the left arm. The pain was predominantly nocturnal, causing significant sleep disturbance and impairment of daily activities. Despite repeated courses of analgesics and nonsteroidal anti-inflammatory drugs prescribed elsewhere, his symptoms persisted.

Physical examination revealed localized tenderness over the distal third of the left humerus without swelling, erythema, or limitation of shoulder or elbow range of motion. There were no neurovascular deficits. The aspirin test was positive, with marked relief of pain following aspirin administration.

Plain radiographs of the left humerus demonstrated a small cortical radiolucent nidus surrounded by reactive sclerosis. (Figure 1) Computed

tomography (CT) confirmed the diagnosis of osteoid osteoma by clearly identifying the cortical nidus in the distal third of the left humerus. (Figure 2) The patient was subsequently referred to our institution for definitive surgical management.

Under general anesthesia, the patient underwent open excision through a direct anterior approach centered over the lesion. The nidus was accurately localized using intraoperative fluoroscopic guidance and completely removed using a high-speed burr. (Figure 3) The resulting bone defect was filled with an autologous

cancellous bone graft harvested from the ipsilateral iliac crest. (Figure 4) Histopathological examination confirmed the diagnosis of osteoid osteoma. (Figure 5)

The postoperative course was uneventful. The patient experienced complete resolution of pain from the first postoperative day, with restoration of normal sleep. At follow-up, the surgical wound had healed uneventfully, and there was no evidence of recurrence or functional impairment.



Figure 1: Plain radiograph of the left humerus showing the osteoid osteoma in the distal third of the humeral shaft. The yellow arrow indicates the lesion



Figure 2: CT scan of the left humerus showing the cortical nidus of the osteoid osteoma in the distal third of the humeral shaft



Figure 3: Intraoperative images showing open excision of the osteoid osteoma through a direct anterior approach, with fluoroscopic localization and complete removal of the nidus using a high-speed burr

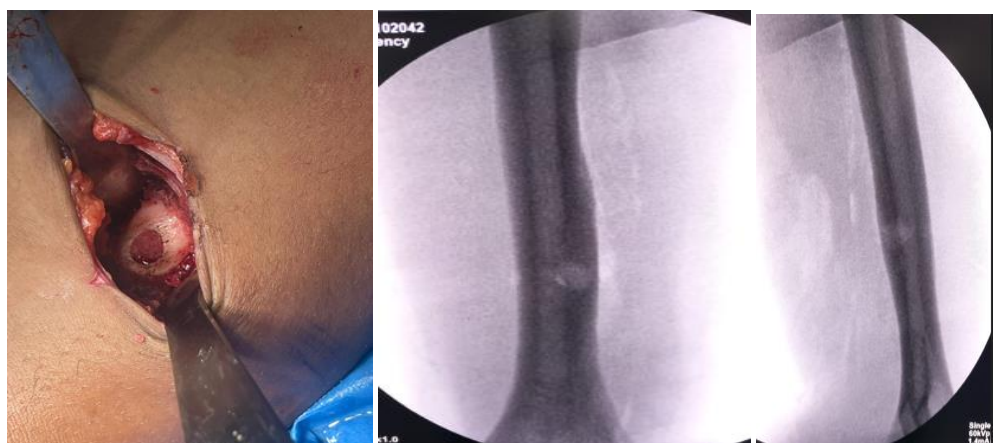


Figure 4: Intraoperative image showing filling of the bone defect with an autologous cancellous bone graft harvested from the ipsilateral iliac crest

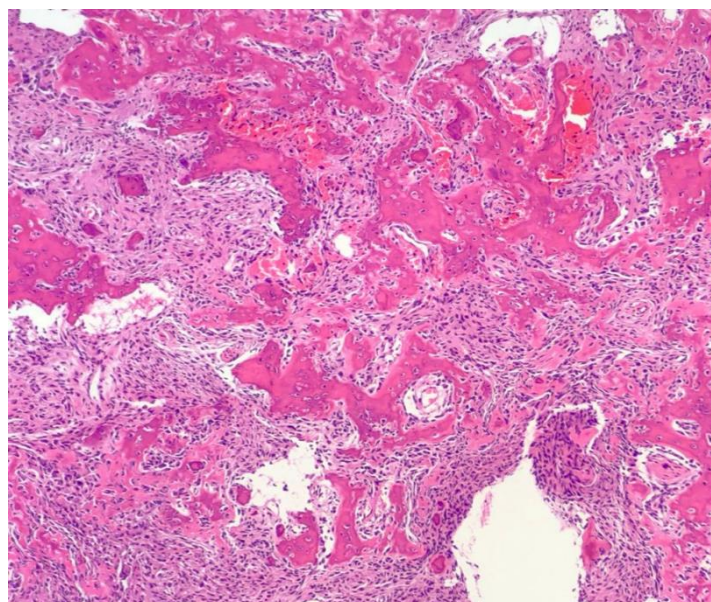


Figure 5: Histopathological examination showing tumor proliferation composed of bony trabeculae, occasionally lined by osteoblastic rimming (H&E ×100)

DISCUSSION

Osteoid osteoma is a benign osteoblastic tumor that predominantly affects young males and most commonly involves the femur and tibia. Humeral localization is uncommon, accounting for a small

proportion of cases. Our patient, a 30-year-old man with a cortical lesion in the distal third of the humerus, represents an unusual but characteristic presentation of this tumor. [3]

The clinical presentation in our case was highly suggestive of osteoid osteoma. The patient reported severe nocturnal pain with significant sleep disturbance and persistent symptoms despite conventional analgesic and NSAID therapy. The marked relief obtained after aspirin administration further supported the diagnosis. This typical pain pattern is related to the high prostaglandin concentration within the nidus. Although upper-extremity osteoid osteomas may sometimes present atypically and mimic other musculoskeletal conditions, the clinical features in our patient were classic. [4]

Imaging findings also contributed to a straightforward diagnosis. Plain radiographs demonstrated a small cortical radiolucent nidus surrounded by reactive sclerosis, while CT clearly delineated the nidus in the distal humeral cortex. CT is considered the most sensitive imaging modality for identifying the nidus and is particularly useful when conventional radiographs are inconclusive. [5] In our case, the characteristic radiographic and CT appearance, together with the typical clinical presentation, allowed accurate preoperative diagnosis.

Several treatment options have been described for osteoid osteoma, including open surgical excision and minimally invasive techniques such as CT-guided radiofrequency ablation (RFA). RFA is currently widely used because of its high success rate, limited morbidity, and rapid recovery, particularly for easily accessible extra-articular lesions. However, open excision remains an effective treatment when percutaneous ablation is unavailable, technically difficult, or when direct removal and histological confirmation are preferred. [6]

In our patient, open excision was selected because of the accessible cortical location of the lesion in the distal humerus. Fluoroscopic guidance allowed accurate localization of the nidus, which was completely removed using a high-speed burr. The resulting cortical defect was filled with an autologous cancellous bone graft harvested from the ipsilateral iliac crest. Histopathological examination confirmed the diagnosis of osteoid osteoma. Complete pain relief was obtained from the first postoperative day, with immediate restoration of normal sleep and no subsequent functional impairment or evidence of recurrence.

This case emphasizes that osteoid osteoma should be considered in the differential diagnosis of persistent localized pain in the humerus, particularly in young adults presenting with nocturnal pain and a positive aspirin or NSAID response. Recognition of the nidus on radiographs and, when necessary, CT allows prompt diagnosis and appropriate treatment [7].

Although minimally invasive ablation techniques are increasingly preferred, open excision remains a reliable and effective option for accessible humeral lesions, providing definitive removal and histological confirmation with excellent clinical outcomes. [8]

Conflict of Interest: No conflicts of interest.

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