# Subperiosteal Osteoid Osteoma of the Neck of Talus

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## ABSTRACT

Juxta-articular, subperiosteal osteoid osteomas arising around the ankle are unusual. Tumors arising on the neck of the talus commonly produce symptoms mimicking monoarticular arthritis. Patients are usually treated for arthritis or ankle sprain, which often leads to a delay in definitive diagnosis. Here we present a case of osteoid osteoma of neck of talus which was presented as ankle pain. It puzzled us until MRI was done. Diagnostic dilemma and delay can be avoided by high index of suspicion. The patient was treated with open removal of the tumor. We also present brief review of literature about juxta-articular, subperiosteal osteoid osteoma which is uncommon from the typical osteoid osteoma occurring elsewhere in the body.

Key words: *juxta-articular, subperiosteal, osteoid osteoma, talus neck*

## INTRODUCTION

Most orthopedic surgeons are well aware of Osteoid osteoma.[1] It is a common tumor comprising approximately 10-12% of all benign bone tumors.[2] This tumor consists of a centrally located vascularized nidus, typically surrounded by a variable amount of sclerotic reaction. The nidus is usually 1-10 mm.[3] This tumor predominantly occurs in children and young adults and is more common in males with a male-to-female ratio of 1.6:1 to 4:1.[3] Clinically, osteoid osteoma is usually accompanied by nocturnal pain promptly relieved by salicylates. Although any bone of the skeleton can be involved, approximately 50% of all osteoid osteomas occur in the femur and tibia.[2] Osteoid osteoma occurring in the foot is unusual and accounts for approximately 4% of cases.[4] Diagnosis of this small benign tumor is often delayed for months or even years.[5,6] Clinical symptoms may present long before radiographic change is evident; in unusual locations the lesion may remain radiographically invisible.[7] This applies especially to a nidus which is juxta-articular and subperiosteal.[8] Despite these general clinical characteristics, the preoperative diagnosis of osteoid osteoma occurring in the foot may be delayed because of unusual location and atypical symptoms.[9,10] In this article, we report an unusual case of Osteoid osteoma of the Neck of Talus in a 19 year old student who presented with ankle pain and soft-tissue swelling mimicking arthritis.

## CASE REPORT

A 19 years male student presented with pain and swelling in the left ankle for 12 months with no history of previous trauma but complaining of regular night

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pain. He was on analgesics regularly for pain. He had been treated as a case of reactive arthritis for about three months elsewhere. Examination revealed diffuse swelling of the whole anterior aspect of right ankle and localized tenderness at the neck of talus. There was local rise of temperature at the site of swelling, but the overlying skin was normal in color and texture. The laboratory data including White Blood Count and erythrocyte sedimentation rate showed normal findings at the time of presentation. Imaging evaluation included radiography, Computerized Tomography (CT) scan and Magnetic Resonance Imaging (MRI) at our institution. Radiography showed normal bone with increased soft tissue shadow (Figure 1). CT scan showed small sclerosis at the neck of the talus (Figure 2). MRI showed a round focus of low-signal nidus in the dorsal aspect of the left talus neck with extensive surrounding marrow and soft-tissue edema on both spin-echo Time 1 (T1) and Time 2 (T2) weighted images which was consistent with an osteoid osteoma(Figure 3). Enblock excision and bone grafting was performed, the sample was sent for histopathological examination. Histopathology confirmed the diagnosis of Osteoid osteoma (Figure 4). The patient was post operatively immobilized in boot cast for four weeks. Six months after surgery patient showed no evidence of recurrence.

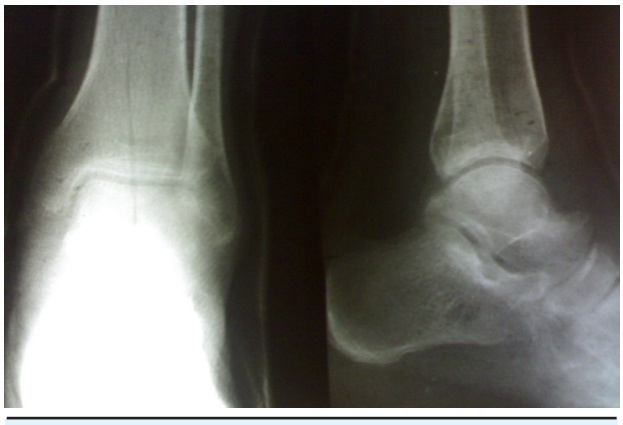

**Figure 1. Ankle x-ray: Anteroposterior and Lateral view.**

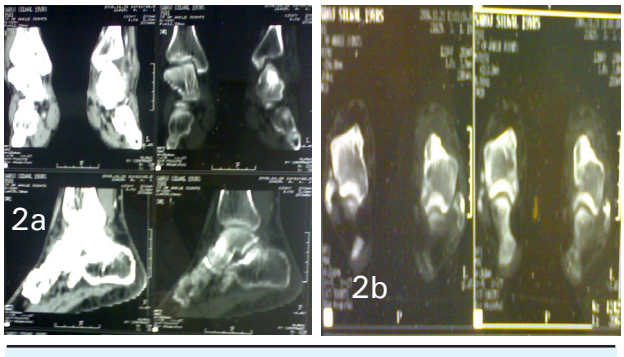


**Figure 2. 2a. CT scan Sagittal Cut. 2b. CT scan Coronal cut**

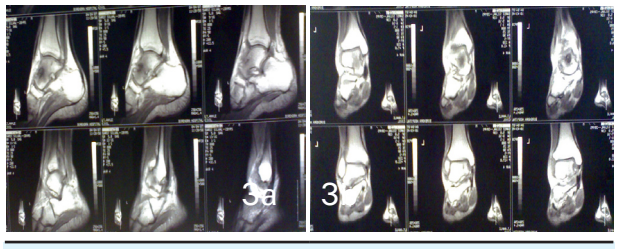


**Figure 3. 3a.T2 MRI saggital image 3b.T2 MRI coronal image**

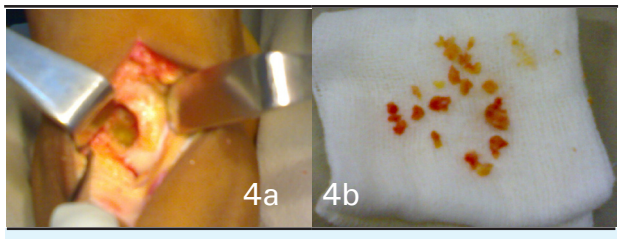


**Figure 4. 4a. Cavity after curettage 4b. Curetted material**

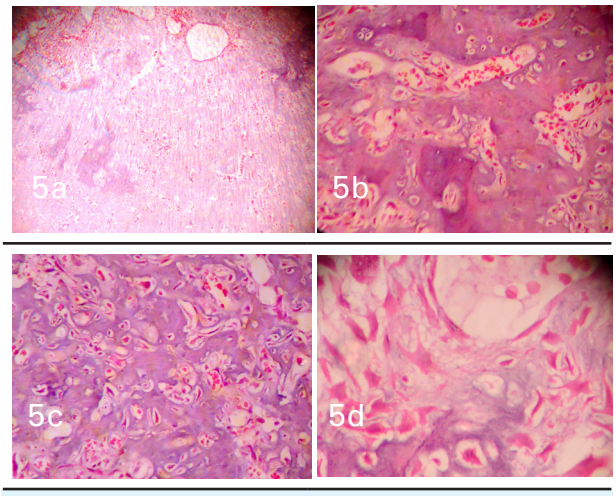


**Figure 5. 5a. histopathology (H and E stainX 40 ) 5b. histopathology (H and E stain X 80 ) 5c. histopathology (H and E stain X 100) 5d. histopathology (H and E stain X 200 )**

## DISCUSSION

Osteoid osteoma is a common bone tumor, comprising approximately 10-12% of all benign bone tumors.[2] Osteoid osteoma occurring in the foot is unusual and accounts for approximately 4% of cases.[4] The common site in the bone of the foot is the talus and in 75% of cases, it is subperiosteal at its juxta-articular region.[11] Preoperative diagnosis of osteoid osteoma occurring in the foot may be delayed because of unusual location and atypical symptoms such as that of sprained ankle,[9] monoarticular arthritis, anterior impingement syndrome, and traction spur of the talar neck.[12] Edeiken, DePalma and Hodes (1966) distinguish three modes of presentation of osteoid osteoma according to the localization of the

nidus in cortical, cancellous or subperiosteal bone. Their description of the subperiosteal lesions includes: "Subperiosteal osteoid osteomas present as round soft-tissue masses immediately adjacent to bone.[13] As a rule underlying bone reveals pressure atrophy or irregular bone resorption. Instead of invoking reactive bone, they affect neighboring joints, causing synovitis, effusion and even inflammation which settles and a normal range of joint movement eventually returns.[14] Joint rarefaction suggests arthritis rather than osteoid osteoma. The literature on subperiosteal osteoid osteoma is sparse. Only thirty cases have been reported, and in more than half of these the first diagnosis was wrong.[15] The talus and distal humerus seem to be the most common sites. Diagnosis is usually based on the typical pattern of pain, with relief by salicylates, and on local tenderness to palpation. Local swelling if present may be seen, but concomitant joint effusion, muscle atrophy, limitation of movement and local warmth may all confuse the diagnosis. Radiographic changes in bone are absent or very limited. The absence of the bone sclerosis which is typical of cortical osteoid osteoma explains this. Local rarefication, slight periosteal new bone formation and joint space narrowing may suggest inflammatory arthritis or even osteomyelitis.[16,17] Bone scans and angiography are also less helpful in Subperiosteal Osteoid osteoma than in the classical cancellous type. Increased uptake of 99Tc seldom reveals a local hot spot, but is usually diffuse and results from reactive hyperemia and associated synovitis.[18,19] CT scans of the elbow and the hind - foot are said to be difficult to interpret because of the anatomical complexity of this region.[20] The synovium is macroscopically thickened, brittle and edematous; microscopically the synovitis is non-specific.[14,16,17,19] Whether this synovitis is of mechanical origin or due to chemical substances from the tumor remains uncertain.[21] The local periosteal reaction sometimes seen at a distance from Juxta-articular osteoid osteoma is probably, as in rheumatoid arthritis, secondary to the synovitis.[1] The basic pathophysiology consists of a small radiolucent nidus containing nerve fibers, vascular elements, and very high levels of prostaglandin which causes chronic reactive change in the surrounding bone resulting in marked surrounding periosteal sclerosis and synovitis.[22,23] The excess sclerotic bone helps to point the location of the lesion during surgery. The prostaglandin is responsible for the constant, severe pain, which arises because the vasodilatory effect of the prostaglandin increases the intra-cortical pressure within the nidus. The prostaglandin also has a potentiating effect on bradykinin, a powerful vasodilator, adding to the pain mechanism. Nonsteroidal anti-inflammatory drugs and salicylates may improve symptoms by inhibiting the production of prostaglandin. Removing the prostaglandin source may resolve symptoms and is thus an indication for surgery.[24]

Medical or surgical management yields similar long-term outcomes; the lesion may regress after a mean period of three years of conservative treatment. This includes prolonged use of oral indomethacine.[25] Different surgical treatments have varying degrees of success. A wide en bloc excision of the nidus with surrounding bone has been the standard surgical treatment. Percutaneous CT Guided Radiofrequency ablation and CT guided Ethanol injection techniques are less invasive and almost as accurate as open surgical excisions but requires a lot of technical expertise and equipments.[26,27] Osteoid osteomas are not known to have malignant potential, although change to an osteoblastoma has been documented.[28,29]

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