Yeditepe Medical Journal 2008;(8):125-129

Osteoid Osteoma After a Fracture of the Distal Ulna Mimicking Osteomyelitis

Case Report

Osteomyelite Benzeyen Distal Ulna Fraktüründen Sonra Osteoid Osteoma

Olgu Sunumu

Elif Karadeli, MD

Baskent University Faculty of Medicine, Department of Radiology

Esra Meltem Kayahan Ulu, MD

Baskent University Faculty of Medicine, Department of Radiology

Ahmet Fevzi Ozgur, MD

Baskent University Faculty of Medicine, Department Orthopedics and Traumatology

Halil Kiyici, MD

Baskent University, Faculty of Medicine, Department of Pathology

Corresponding Author

Elif Karadeli, MD

Baskent University Faculty of Medicine
Department of Radiology
Bahcelievler/Ankara/Turkey
e-mail: elifkaradeli@gmail.com

ABSTRACT

Osteoid osteoma is benign tumor of unknown cause that is usually located in long bones. We report a case of osteoid osteoma occuring at the site of a previous fracture of the ulna treated by internal fixation. The radiological findings of the patients was similar to osteomyelitis. As far as we know this is the first case in English literature.

Key words: *Osteoid osteoma, Fracture, Long bones*

ÖZET

Osteoid osteoma genellikle uzun kemiklerde lokalize, nedeni bilinmeyen iyi huylu bir tümördür. Biz daha önce internal fiksasyon ile tedavi edilen ulna kırığının yerinde gelişen osteoid osteoma olgusunu sunduk. Hastanın radyolojik bulguları osteomyelite benziyordu. Bizim bilgimize göre bu İngiliz literatüründeki ilk olgudur.

Anahtar kelimeler: *Osteoid osteoma, Kırık, Uzun kemikler*

INTRODUCTION

Osteoid osteoma is a common bone tumor, comprising approximately 10-12% of all benign bone tumors (1). It is usually located in long bones, mostly in femur and tibia. The lesion is rarely seen in the ulna. There are some reports in the literature about the radiological and clinical presentation of osteoid osteoma mimicking osteomyelitis (2). In addition it was reported that the osteoid osteoma may be seen after trauma and bone fractures (3,5). We report the radiological findings of a patient with osteoid osteoma in the ulna mimicking osteomyelitis. The patient had a history of distal ulnar and radial fracture twelve years ago.

CASE REPORT

A 15-year-old male complained of a 7 month history of pain and a 2 month history of swelling in his left wrist was referred to the department of Orthopedics and Traumatology. The symptoms were not relieved by nonsteroidal inflammatory drugs. He had a history distal ulnar and radial fracture twelve years ago treated by internal fixation (Figure 1). In physical examination, there was moderate swelling in the ulna that was painful on palpation. His white blood cell count and erythrocyte sedimentation rate were in normal limits. We evaluated him with the plain radiography and the extremity MRI. The radiography showed the significant cortical thickening on the radial side of distal ulna thought to be related to the callus formation (Figure 2). The MRI was performed on a Philips Gyroscan Intera 1.5 T system using extremity coil. The MRI showed an intracortical lesion in the medial side of the distal diaphysis of ulna that was hypointense on T1 and hyperintense on T2 weighted images compared to bone marrow. The lesion showed peripheral contrast enhancement on fat saturated T1 weighted images. Significant cortical thickening and expansion was noted at the site of lesion. There was diffuse marrow edema around the lesion showing contrast enhancement. Furthermore, the contrast enhancement was also detected in the paraosseous soft-tissues near the lesion (Figure 3). The preoperative diagnosis was the osteomyelitis and abcess formation of the bone. CT and bone scan were not obtained. In surgery, curettage of lesion without bone grafting was performed. The histologic diagnosis was consistent with an osteoid osteoma. There were microscopic focuses of osteoid, immature bone formation, too many osteoblast cells and some osteoclast cells in the histopathologic examination (Figure 4). There was not any finding of a malign tumor. The postoperative plain radiography shows the radiolucency in operation site (Figure 5).

Figure 1: *Plain radiography shows distal ulnar and radial deplaced fractures when the patient is four years old.*

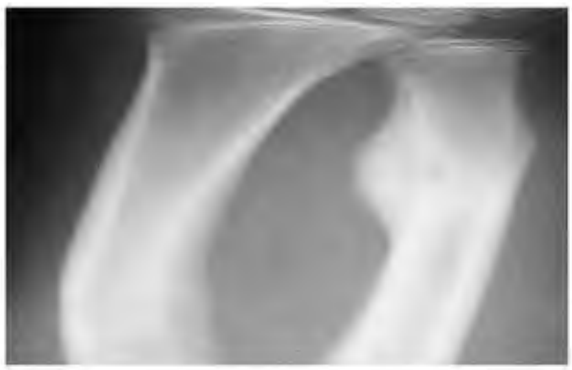

Figure 2: *Plain radiography shows significant cortical thickening thought to be related to the callus formation although there is no identifiable lesion at the same localisation.*

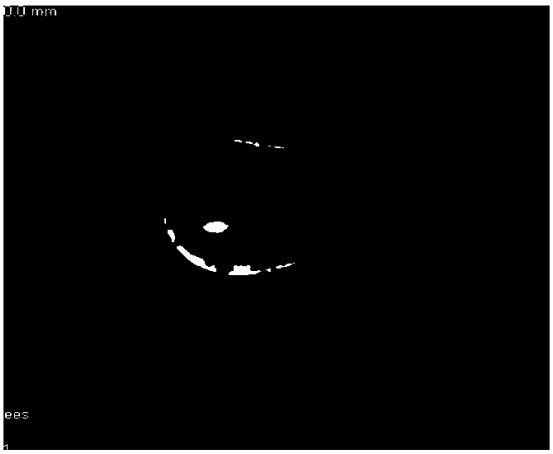

Figure 3a: *Axial*

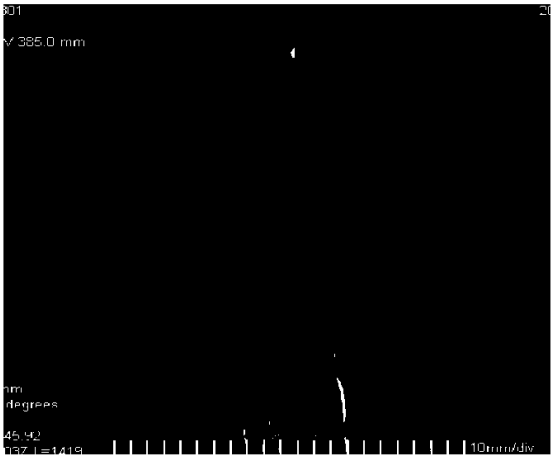

Figure 3b: *Sagittal*

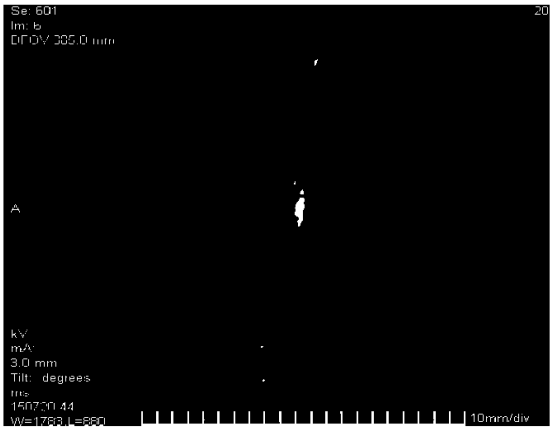

Figure 3c: *T1 weighted images show a hypointense lesion and sagital*

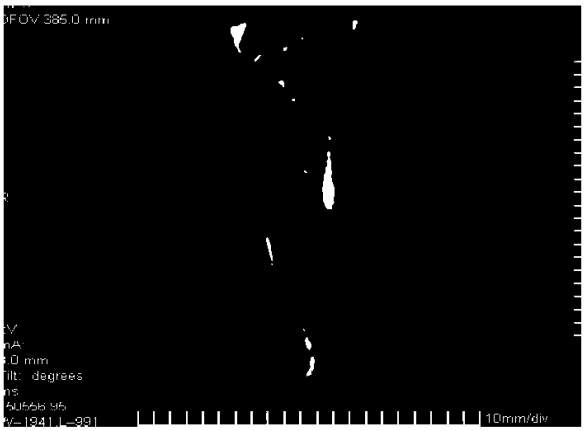

Figure 3d: *Coronal. Significant juxtacortical marrow edema and soft tissue edema was seen in T2 weighted images*

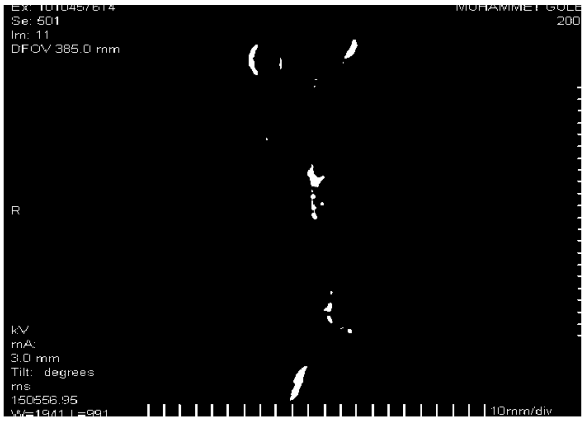

Figure 3e: *Coronal. Significant juxtacortical marrow edema and soft tissue edema was seen in T2 weighted images*

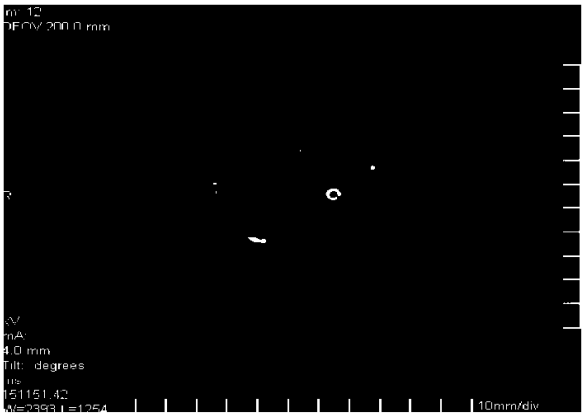

Figure 3f: *T2 weighted images show a hyperintense lesion located on the radial side of distal ulna. The cortex was significantly thickened at the level of lesion related to the periosteal reaction. The lesion was enhancing peripherally after IV contrast medium was given.*

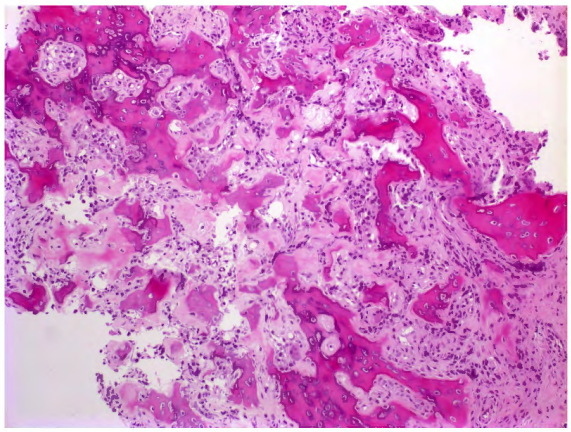

Figure 4: *Nidus, x100, H&E.*

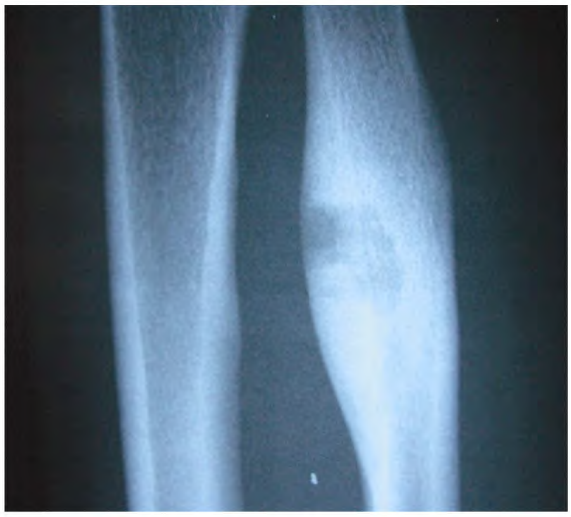

Figure 5: *The postoperative plain radiography shows the radiolucency in operation site.*

DISCUSSION

Osteoid osteoma is a benign bone tumor consisting of an osteoid nidus in a highly vascular connective tissue stroma. The nidus is usually 1-10 mm. 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 (6). Direct graphy examination shows bone sclerosis with an area of central radiolucency. CT findings of osteoid osteoma were defined as a low-attenuation nidus with possible internal calcification and variable peripheral sclerosis. On MRI, the nidus of osteoid osteoma shows low or intermediate signal intensity on spin echo T1 weighted images, variable signal intensity on T2 weighted images, and variable enhancement. Sometimes bone marrow and soft tissue edema may accompany the lesion. The juxtanodal bone marrow edema was defined. Perinidal soft tissue swelling has been reported, particularly in the digits of the hands and feet and in superficially located bones such as the anterior tibia, distal fibula, and distal radius and ulna. Other manifestations include reactive periosteal bone formation, particularly when the nidus is in cortical bone, and nonspecific proliferative synovitis, usually lymphofollicular in nature, when the nidus is within a joint (1,7,8). The mechanism that results in bone marrow and soft tissue edema is uncertain; however, prostaglandin, which is reported to be a cause of peritumoral edema on MRI, has been implicated because levels of this inflammatory mediator are elevated in osteoid osteoma. Baron and Garcia et al (2,3) have been reported 2 cases of osteoid osteoma after fracture of bones.

To our knowledge, an osteoid osteoma developed after a fracture of the distal ulna has not been reported yet in the literature. In addition the MRI features of our lesion were not typical. The lesion showed peripheral enhancement beside bone marrow and soft tissue edema mimicking osteomyelitis and abscess formation. The lesion had significant cortical thickening thought to be related to periosteal bone formation. In the cases of posttraumatic osteoid osteoma reported by Baron (3), Garcia (4) and Adil (5) et al, the manifestation time of osteoid osteoma after fracture was as long as 4-6 years. These fractures were located in the femur and the radius, and they have been also treated by internal fixation. Our case had history of distal ulna fracture treated by internal fixation however, the development of the lesion was longer than the defined in literature. Spjut et al (9) has been theorized that fracture and internal fixation may be a trigger for the formation of the osteoid osteoma. Adil et

al (5) thought that the reason of osteoid osteoma might be the invagination of the periosteum at the time of reduction and fixation of the fracture.

We report a case of osteoid osteoma occuring at the site of a previous fracture of the ulna treated by internal fixation. Radiography could not showed the lesion except significant cortical thickening thought to be related to the callus formation. The peripheral enhancement of our lesion and juxtacortical bone marrow edema resembled the abscess formation on MRI. In conclusion, osteoid osteoma should be considered in the differential diagnosis of bone pain, especially, if the patient had history of previous trauma, and is young. Direct graphy, CT and MRI are useful diagnostic tools in the evaluation of these lesions although the lesion sometimes presented with atypical features.

REFERENCES

1)Kransdorf MJ, Stull MA, Gilkey FW, Moser RP Jr. Osteoid osteoma. Radiographics 1991;11: 671-696

2)Lee GK, Kang IW, Lee ES, et al. Osteoid osteoma of the tarsal cuboid mimicking osteomyelitis. AJR 2004;183:341-342.

3)Baron D, Soulier C, Kermabon C, Leroy JP, Le Goff. Osteomes osteoides post-traumatiques: a propos de deux cas et revue de la litterature. Rev Rheum Mal Osteoartic 1992; 59: 271-275

4)Garcia G, Lance JF, Lin JJ. Osteoid osteoma: an unusual presentation. Clin Orthop 1981;156:216-218.

5)Adil A, Hoeffel C, Fikry T. Osteoid osteoma after a fracture of the distal radius. AJR 1996; 167: 145-146

6)Greenspan A. Benign bone forming lesions: osteoma, osteoid osteoma, and osteoblastoma-clinical, imaging, pathologic, and differential considerations. Skeletal Radiol 1993; 22: 485- 500

7)Bauer TW, Zehr RJ, Belhobek GH, Marks KE. Juxtaarticular osteoid osteoma. Am J Surg Pathol 1991;15:381-387

8)Snarr JW, Abell MR, Martel W. Lymphofollicular synovitis with osteoid osteoma. Radiology 1973; 106:557- 560

9)Spjut HJ, Fechner RE, Ackerman LV. Tumors of bone and cartilage, fasc. 5. Washington DC: Armed Forced Institute Pathology, 1971: 120- 132