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A rare location for osteoid osteoma on the foot: A case report

Ayakta osteoid osteoma için nadir bir yer: Olgu sunumu

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Abstract
Osteoid osteoma (OO) is benign small neoplasm of the bone that accounts for 11% of all benign tumors and 3% of all primary benign tumors. Usually they are located at diaphyseal and metaphyseal regions of long bones, but foot lesions are rare. Metatarsal osteoid osteoma's are quite rare. We present a 23 years old male with the complaints of ongoing swelling localized at fifth finger of right foot for 1 year. Preoperative osteoid osteoma diagnosis was made and lesion was removed with curettage and burring.
Keywords: Osteoid osteoma, Metatarsi, Curettage, Foot

Öz
Osteoid osteoma (OO), tüm iyi huylu kemik tümörlerinin %11'ini ve tüm primer iyi huylu tümörlerin %3'ünü oluşturan kemiğin benign küçük neoplazmıdır. Genellikle uzun kemiklerin diyafiz ve metafiz bölgelerinde bulunurlar, ancak ayak lezyonları nadirdir. Metatarsal osteoid osteomalar oldukça nadirdir. Bu çalışmamızda sağ ayak beşinci parmağında, 1 yıl boyunca l devam eden şişlik şikayeti olan 23 yaşında bir erkek hastayı sunmayı amaçladık. Hastaya preoperatif osteoid osteoma tanısı konuldu, küretaj ve burleme işlemiyle lezyon alındı.
Anahtar kelimeler: Osteoid osteoma, Metatars, Küretaj, Ayak

Introduction

Osteoid osteoma (OO) is benign small neoplasm of the bone that accounts for 11 % of all benign tumors and 3% of all primary benign tumors [1]. The most frequent localization of OO is the diaphyseal and metaphyseal regions of long bones, especially the femur and tibia [1]. Approximately 10% of all OO is seen at foot especially at neck of the talus [2]. Other locations of the foot are rare occurrence. We want to present a case of metatarsal OO in this article.

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Case presentation

A 23 years old male otherwise healthy patient admitted to our outpatient clinic with the complaints of ongoing swelling localized at fifth finger of right foot for 1 year. The patient did not complain of pain and also had no other clinical findings except edema. He was indeed complaining about the swelling on the lateral of the foot expanding regularly within 1 year. There was significant swelling on the proximal metaphysis of fifth metatarsi at physical examination (Figure 1). He expressed difficulty while wearing his shoe. There was accompanying tenderness and mild increase in local temperature. Preoperative plain radiographs demonstrated a lytic bone lesion with a sclerotic rim at proximal of metaphysis the fifth metatarsi. Lesion was elevated the periosteum of the metatarsal and went out of cortical bone (Figure 2). Informed consent was obtained from the patients included in the study.

Blood tests and bone scan was made since OO's clinical presentation can mimic osteomyelitis or inflammatory arthritis. Infection indicators like sedimentation rate, C-reactive protein, and leukocyte values were within normal ranges. Tc^{99m} bone scan revealed diffuse intense uptake at fifth metatarsi. Magnetic resonance imaging (MRI) scan was obtained for differential diagnosis. MRI showed rounded nidus along the lateral border of fifth metatarsi bone marrow and soft tissue edema in fifth metatarsi (Figure 3).

Preoperative osteoid osteoma diagnosis was made. The patient was informed about the procedures and an informed consent form was signed. A longitudinal incision on the lateral side of the fifth metatarsi was made for surgical exposure. OO with significant nidus was remarkably seen at fifth metatarsi (Figure 4). Intraoperative frozen section of the surrounding soft-tissue revealed no malignancy. Intraosseous lesion was removed with curettage and burring. Lesion was sent for culture and pathological examination; osteoid osteoma diagnosis was confirmed (Figure 5). The patient did not feel any pain during preoperative and later postoperative process except the early postoperative period. Our patient healed with no complication after a 2 year follow up period.

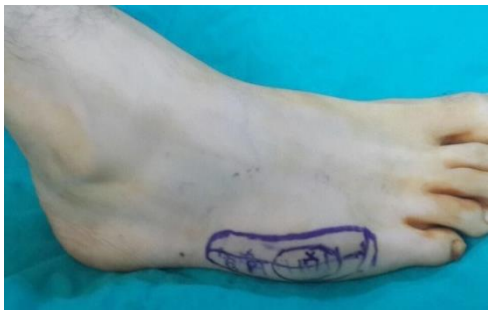

Figure 1: There was significant swelling on the proximal metaphysis of fifth metatars at physical examination

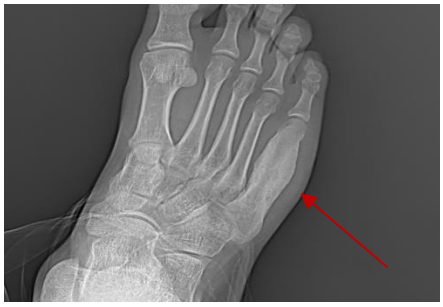

Figure 2: Lesion was elevated the periosteum of the metatarsal and went out of cortical bone

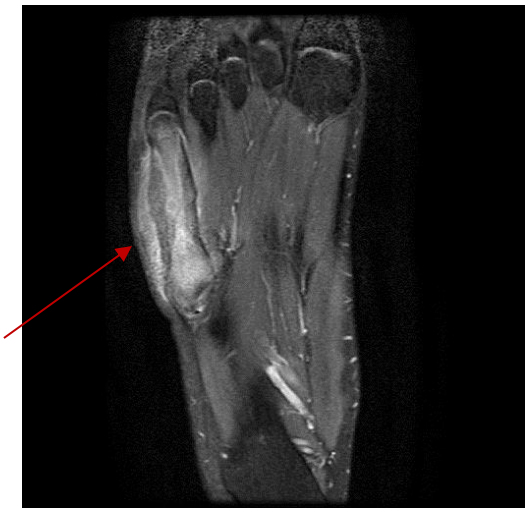

Figure 3: MRI showed rounded nidus along the lateral border of fifth metatars bone marrow and soft tissue edema in fifth metatarsi

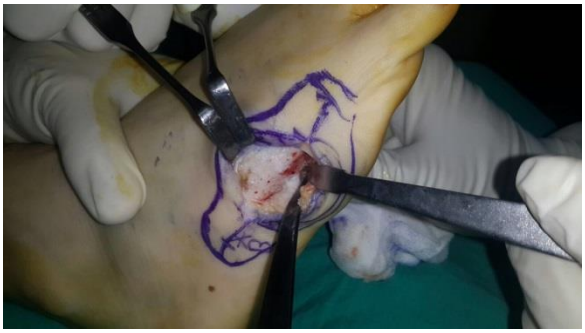

Figure 4: Significant nidus was remarkably seen at fifth metatars

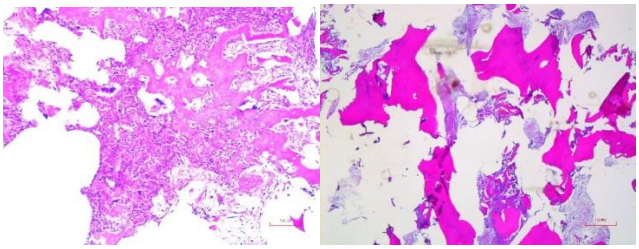

Figure 5: Pathological examination of the removed nidus

Discussion

We presented a case of an uncommon located osteoid osteoma. Foot is a rare location for OO. Talar neck comparatively the most common (3.4%) region for foot OO [2]. Metatarsal osteoid osteoma is quite rare with the incidence of 1.7% [2]. Spencer et all presented a case report about 24 -year old female patient who was diagnosed as fifth metatarsal's osteoid osteoma. Their radiological studies revealed erosion of the medial aspect of the head of the fifth metatarsal with destruction of the cortical margin. Patient healed with complete relief after removing of the lesion with curettage and burring [3].

Classical history of osteoid osteoma is progressive throbbing, disturbing pain that relieve with non-steroidal anti-inflammatory drugs and worse at night. It is so severe that wakes the patient up. Nocturnal pain is unique among bone tumors [4]. The reason for timing of pain is unknown but there are 2 explanations about the reason of pain. First, prostaglandin E2 ($PGE_{2)}$ is responsible for the pain by vasodilatation and by affecting pain signals [5]. Nidus osteoblasts produce cyclooxygenase-2 enzyme which is key for production of $PGE_{2.}$ PGE_2 concentration in the nidus may be 1000-fold increase in concentration [6-8]. Second pain reason is nerve fibers in the nidus. They are established especially in the perifocal reactive zone [4]. Reactive zone is a loose fibrovascular tissue with nerve

fibers in. Tension at this reactive zone, which should be loose, results in with pain. Our patient did not show classical osteoid osteoma pain history. He didn't have nocturnal pain and even severe pain. All his complaints were about the fear of malignant tumor because of severe swelling and enlargement. We think that osteoid osteoma unloaded its content by elevating the periosteum of the metatarsal and went out of cortical bone. This mechanism prevented pain but swelling occurred.

Differential diagnosis of osteoid osteoma is with bone abscess, solitary enostosis, osteomyelitis, sclerosing osteitis, syphilis of bone, early-stage Ewing's sarcoma, glomus tumor, or stress fracture. When there is confusion about diagnosis blood tests, bone scan and either computerized tomography (CT) or MRI must be performed. We also planned blood test, bone scan and MRI scan for our case to differentiate the diagnosis with osteomyelitis.

Optimal treatment for osteoid osteoma is surgery. Lesion is either excised or ablated because pain disturbs the patient's much, even wake them up at night. Nevertheless, there are numerous publications that state spontaneous regression of untreated OO during an average of 6 years [9]. Lesions closer to bone cortex and younger patients has higher chance of spontaneous regression [1]. If the patient tolerates pain with using non-steroidal anti-inflammatory drugs conservative treatment may be a choice for the patient. But if there is a severe pain that affects patient's participation in social life and psychological state then there is an indication for surgery.

The nidus, the source of pain, must be removed completely for pain relief. Most important step in cure is to determine the exact localization of nidus. Preoperative radiography or CT, preoperative CT-guided needle marking or perioperative fluoroscopic scanning must be done for exact localization. Occasionally in very rare cases, like ours, nidus can be seen visible even macroscopically.

En-bloc resection and removing with curettage and burring techniques are most common surgical methods [1]. Although wide local excision has greater advantages like assurance that all the nidus is removed, it is also more invasive. Also, success rates are very high with careful local curettage and burring technique [10]. Less invasive techniques like radiofrequency ablation treatment [11], CT-guided percutaneous nidus removal [10] are also favorable techniques for nidus removal.

Conclusion

Osteoid osteomas are common benign lesions but foot lesions are rare. Metatarsal osteoid osteoma is quite rare entity. Because of their presentations in uncommon location should be kept in mind as a reason of foot pain. It is possible to get high success rates with careful surgery to well-localized nidus in the cases which conservative treatment does not benefit.

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