

Osteoid osteoma of the patella

Case report and review of the literature



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Osteoid osteoma of the patella: case report and review of the literature

Osteoid osteoma is a benign, bone-forming tumor. The diaphyses of the long bones are the sites of predilection (at least 50% of all cases occurring in the femur and the tibia). Also this lesion has a male preponderance and the majority of cases present in the second and third decade. We represent an unusual localization of osteoid osteoma in the patella of a 51-year old woman.

KEY WORDS: Osteoid osteoma of patella, MRI – gadolinium contrast administration.

Case report

A 51-year old female referred to our department on July 2000 with a 2^{1/2} years history of intense, aching knee pain, present day and night, well localized at the patella. There was no history of previous trauma, nor relief with non-steroidal antiinflammatory agents administration. Regarding past medical history, hypertension was only recorded. Physical examination revealed mild effusion, no redness or local rise of temperature. Range of motion was very limited (from 0° to 20° of extension) due to incapacitating pain, which was aggravated by patellar squeezing. Severe thigh atrophy was also apparent, whereas quadriceps contraction was impossible because of pain. Clinical examination could not be completed due to patient's non-cooperation. Laboratory studies including CBC, ESR, CRP and basic biochemical control were unremarkable.

A profile radiograph of the knee joint showed a small radiolucent nidus located on the upper border of the patella (Fig. 1).

MRI (T1WI – sagittal image) showed a well circumscribed round alteration in the marrow of the patella,



Fig. 1: Profile radiograph of the knee joint. Small radiolucent nidus located on the upper border of the patella.

without severing of the shell bone (Fig. 2). T2-weighted axial image showed the low signal intensity of the alteration (Fig. 3). Sagittal fatsuppressed T1-weighted image after intravenous gadolinium contrast administration showed an intense peripheral enhancement of the lesion (Fig. 4). Also the coronal fatsuppressed T1-weighted image after intravenous gadolinium contrast admi-

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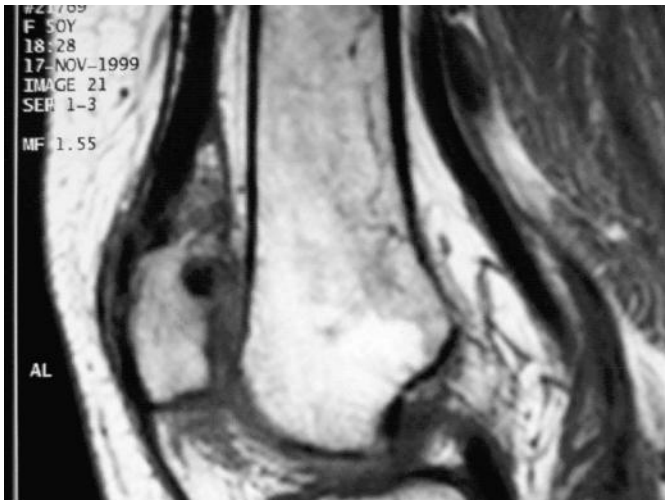


Fig. 2: MRI T1WI - sagittal: Well circumscribed round alteration in the marrow of the patella, without severing of the shell bone.

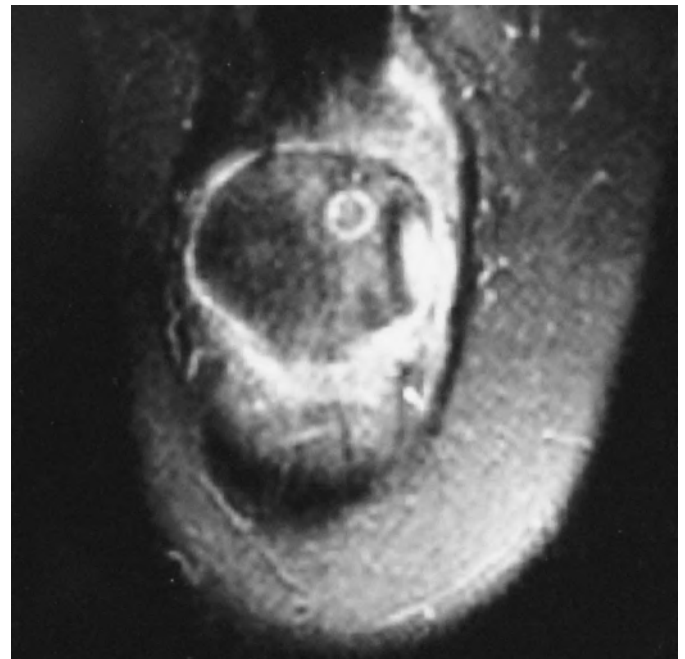


Fig. 5: MRI T1WI - coronal fatsuppressed + Gd: Peripheral enhancement of the lesion

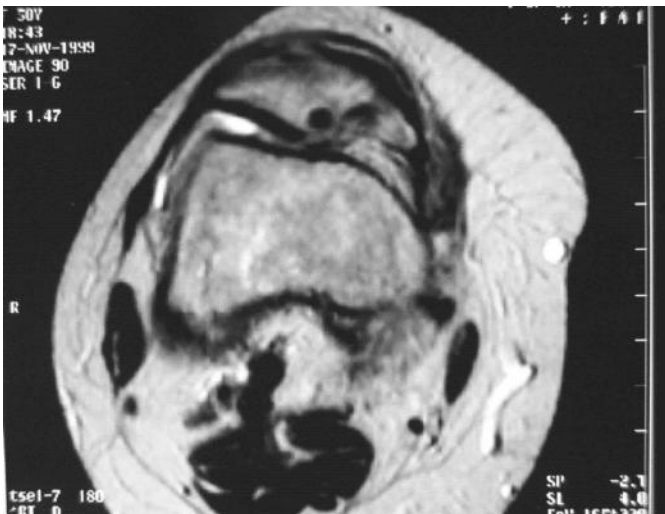


Fig. 3: MRI T2WI - axial: Low signal intensity of the alteration.

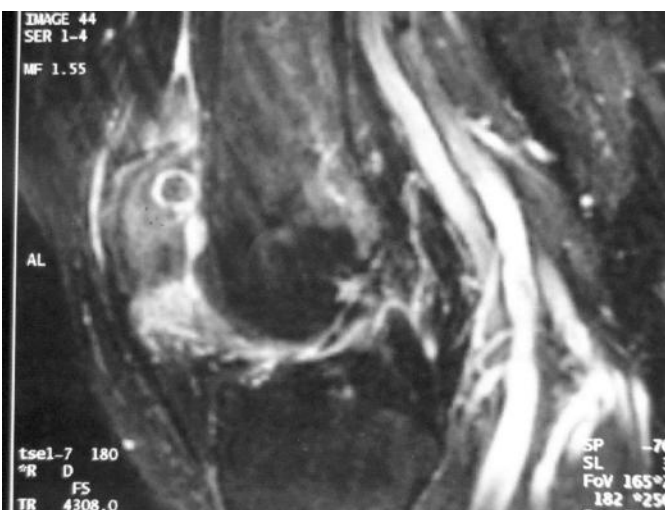


Fig. 4: MRI T1WI - sagittal fatsuppressed + Gd: Intense peripheral enhancement of the lesion.

nistration demonstrated a similar peripheral enhancement of the lesion (Fig. 5).

Discussion

Jaffe was the first to describe osteoid osteoma in 1935, as a benign neoplasm^{1,4}. This has a male preponderance (3:1) and is usually presented in the second and third decade of life, although it may occur in any age².

Osteoid osteoma is located in the diaphyses of the long bones (50% of all cases occurring in the femur and the tibia) but theoretically can be located in any bone^{1,2,3} such as the ethmoid with intraorbital and intracranial extension⁹, the hand and wrist¹⁰, the astragalus¹², the lunate¹³, even in multiple locations¹¹ or may occur in a former fracture site¹⁴.

An intense, aching, well localized, pain, present mainly at night is the characteristic symptom of this disease. This pain is totally relieved with aspirin. Severe thigh atrophy of the muscles due to confinement of motility is also apparent.

Despite the fact that characteristic pain, having night appearance and relieved by aspirin and characteristic radiological image, with the radiolucent nidus surrounded by sclerotic halo, may easily lead to a certain diagnosis of osteoid osteoma, in many cases the clinical and radiological features are atypical and may lead in difficulties in diagnosis, unnecessary surgical procedures and delayed therapy^{3,5}.

Mainly in cases that pain is located in the knee joint, difficulties in diagnosis are even more. At the past Torg et al⁶ reported 11 cases of osteoid osteoma that caused knee pain and emphasized the difficulties in diagnosis.

Another case of rare localization of osteoid osteoma in the patella is referred by Koos Z. and Than P.⁷ in a 17-year-old girl with right anterior knee pain for 2 years, which was initially believed to be due to chondromalacia patellae. After ineffective conservative management, arthroscopy was undertaken, but was normal.

The pain worsened, especially at night. Repeated radiographs revealed a small radiolucent lesion with central mineralization in the upper part of the patella. Despite the absence of a typical sclerotic halo, the appearances were strongly suggestive of osteoid osteoma. The lesion could hardly be seen on the AP view. ^{99m}Tc-MDP bone scintigraphy demonstrated significantly increased uptake in the right patella surrounded by less intense uptake - the double density sign characteristic of osteoid osteoma. Fluoroscopically controlled en-bloc resection of the lesion was performed. Osteoid osteoma was confirmed histologically. The patient is asymptomatic after 2 years of follow-up.

Also Cohen et al.⁸ represent a case of a 25-year-old woman with long-standing anterior, right knee pain who had 3 interventions: 2 diagnostic arthroscopies and distal, femoral biopsy, without any result. Supported by X-ray and scintigraphic findings, the diagnosis of osteoid osteoma of the patella was suggested and then histologically confirmed.

Patellofemoral pain is the most common symptom complex in the knee joint. Despite its frequent presentation diagnosis sometimes remains difficult. There are multiple causes of patellofemoral pain such as overuse syndromes, patella dislocations or subluxations, patella tendinitis, degenerative arthritis, tumors, osteochondritis dissecans or infections.

In our case, the possible diagnosis based on the clinical history of the patient, the clinical examination and the image findings, are osteonecrosis, osteoblastoma, giant-cell tumor, Brodie's abscess, osteoid osteoma and eosinophilic granuloma.

Chronic osteomyelitis can be post-traumatic, postoperative or sequel of acute osteomyelitis.

The causal organisms are usually staphylococci, streptococci and occasionally pneumococci and haemophilus influenzae or other bacteria like *E. coli* or *pseudomonas* etc introduced from septic wounds. Treatment and healing are feasible at any stage because of natural resistance or under the influence of antibiotics. At the earliest stage of minimal destruction, the exudate is absorbed and new bony trabeculae are formed¹⁵.

Organisms of lesser virulence and inadequate patient resistance may result in the formation of a persisting abscess that is surrounded by fibrous membrane and walled off by a ring of dense bone known as Brodie's abscess. A Brodie's abscess is usually small, but it may be of any size and occur anywhere in the bone. Clinically it may remain silent for years, or present with recurrent attacks of intense pain. During an attack the bone is tender and there may be a little swelling. X-rays show a translucent

area with a well-defined margin and a small area of surrounding sclerosis, beyond which the bone looks normal¹⁵.

Osteoid osteoma is small, round or oval in shape, presented in young adults, especially males, from 10 to 25 years of age, although occurrence is possible from 5 to 35 years. It has a predilection for the long bones, particularly the tibia and the femur. It can occur in intramedullary, intracortical or periosteal sites. The leading symptom is pain, which is sometimes severe, continuous, not relieved by rest, worsened at night. Salicylates often relieve the pain. The x-ray shows a small radiolucent area, usually less than 2 cm, called nidus¹⁹.

Osteonecrosis is presented with symptoms of anterior knee pain, continuous, occurring also at night and increased by walking, effusion and mechanical obstruction. X-ray shows subchondral radiolucency, named crater, surrounded by sclerotic halo¹⁶.

Osteoblastoma is presented in young male adults usually less than 20 years of age. It can occur in cortex, in spongiosa or in periosteum. Pain is dull, aching and persistent not nocturnal or relieved by aspirin. In x-ray the lesion is eccentric well-circumscribed and expansile with an intact surrounding shell of bone. Centrally there is usually a lytic area over 2 cm with surrounding sclerosis¹⁷.

Giant-cell tumor occurs in young adults with chronic, constant pain, well localized, progressively more severe, worsened at night. Activity increase pain and causes swelling. X-rays demonstrate a sharply circumscribed area of reduced density asymmetrically located without new bone formation¹⁹.

Eosinophilic granuloma is a solitary, rarely multiple benign bone-destructive lesion. If lesions are multiple, usually only one is symptomatic. Complaints are limited to local areas of involvement and consist of constant, dull, aching pain, tenderness and swelling. X-rays show a well localized and radiotranslucent defect without surrounding new bone formation¹⁸.

In conclusion, the osteoid osteoma must be included in the differential diagnosis of persistent - chronic knee pain, especially when the objective findings of the knee are vague. Plain radiographs of the knee usually don't have high diagnostic value, whereas MRI before and after contrast medium (Gadolinium) administration can be suggestive of such a lesion. CT and isotope bone scan can be very helpful in detecting the disease, taking under consideration the main disadvantage of x-ray use in the contrary with MRI.

Riassunto

L'osteoma osteoide è un tumore benigno delle ossa. Le diafisi delle ossa lunghe sono i siti prediletti per la sua localizzazione (in effetti più del 50% di tutti i casi noti sono localizzati al femore ed alla tibia). Sembra che

la lesione si presenti più di frequente nel sesso maschile e la maggior parte dei casi riguarda la seconda e la terza decade della vita quale età di sviluppo. In questo studio presentiamo l'insolito caso di un osteoma osteoide comparso in una donna dell'età di 54 anni e localizzato nella patella.

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