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Case Report

A case report of an unrecognized osteoid osteoma of the proximal femur ☆,☆☆

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ABSTRACT

We present the case of a 59-year-old male patient with unrecognized osteoid osteoma in radiography as well as in magnetic resonance imaging. Computed tomography revealed osteoid osteoma that was successfully treated with percutaneous computed tomography guided radiofrequency ablation. The osseous pathology was underestimated on magnetic resonance imaging in the presented case and bone marrow edema led to incorrect diagnosis. The particular case emphasizes the value of computed tomography scans diagnosing an osteoid osteoma.

Case presentation

A 59-year-old patient presented in November 2017 to our clinic with progressive right hip pain. He did not have any history of a specific illness or previous trauma. In September 2016, after the initial evaluation by an orthopedic surgeon, the patient's pain was partially alleviated by nonsteroidal anti-inflammatory drugs. This orthopedic surgeon found transient bone marrow edema (BME) in an externally performed magnetic resonance imaging (MRI) in September 2016 of the right hip. Control MRI in September 2017 still showed BME. The patient was referred to our clinic as his pain progressively increased and he had started limping. In his first examination in our clinic, he had right hip pain and difficulty walking. Clinically, the range of motion demonstrated 15° loss of inter-

Abbreviations: BME, bone marrow edema; CT, computed tomography; MRI, magnetic resonance imaging; OO, osteoid osteoma; TIRM, turbo inversion recovery magnitude.

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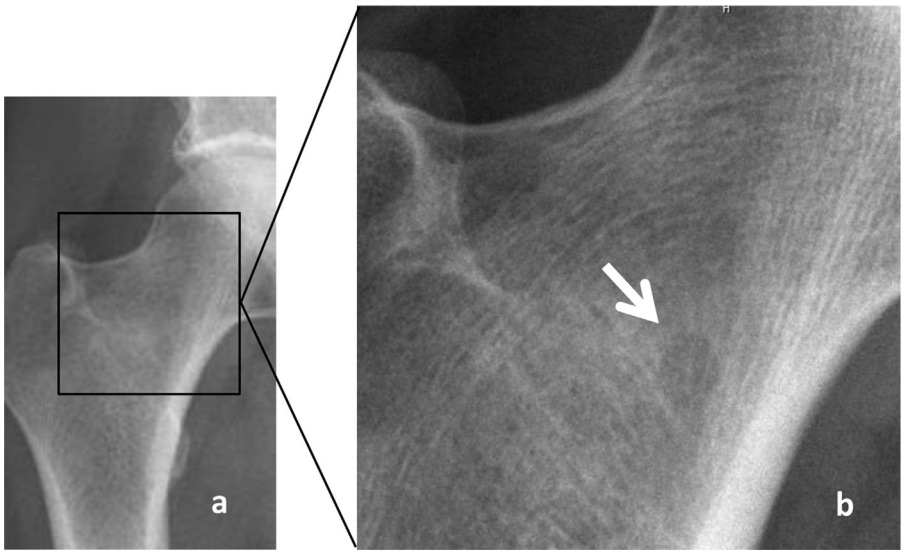

Fig. 1 – Preoperative anterior-posterior hip radiography shows in retrospect evaluation a small oval lucency within the ward triangle (A) with an enlarged view of the lucency (B)—see arrow. This was only noticed after exact evaluation of the MRI.

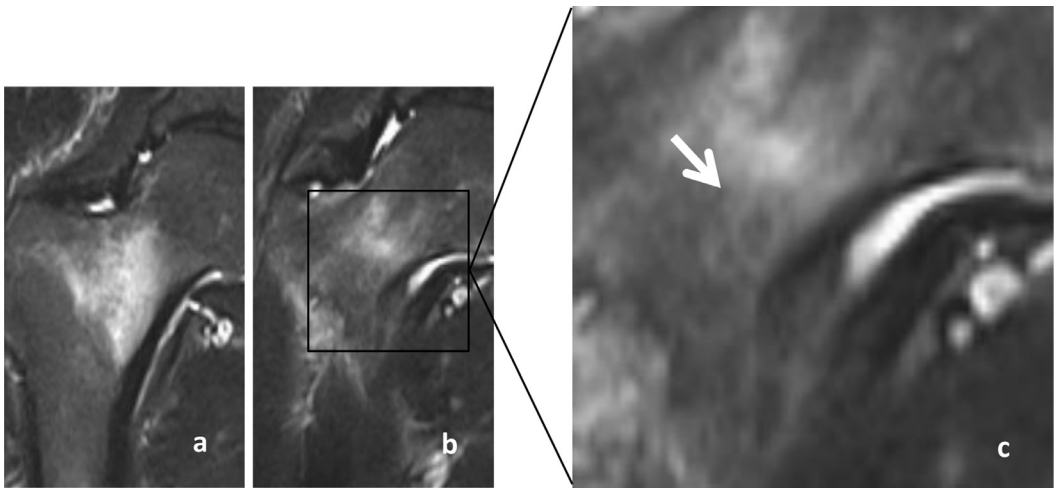

Fig. 2 – MRI (T2-weighted TIRM sequence) shows BME in the femoral neck, primarily described as transient BME (A) with the osteolytic area visible on only 1 image (B) with an enlarged view of the osteolytic area (C)—see arrow.

nal rotation of the right hip joint in comparison to the left hip. He did not show erythema, temperature increase, or swelling of the hip. The infection parameters were within the normal ranges. Most evidences suggested transient BME or femoral head necrosis as possible diagnoses. Contradictions were the patient's long period of illness for more than 6 weeks, as well as the persistency of BME without any signs of necrosis. In our initial assessment in November 2017, plain anterior-posterior hip radiography was considered normal (Fig. 1). The external MRI that was performed 2 months before showed BME of the inferomedial portion of the anterior femoral neck (Fig. 2A). The presence of a small osteolytic area was visible in only 1 sequence (Fig. 2B and 2C). In retrospect, a questionable small oval lucency within the ward triangle was present adjacent to the lesser trochanter on the anterior-posterior projection (Fig. 1A and 1b). Additionally, a computed tomography (CT) scan (Fig. 3) including 3D reconstruction (Fig. 4) was performed defining the osteoid osteoma (OO) nidus measuring 5 mm in subcortical location with minimal surrounding sclerotic bone. This lesion was successfully treated with percutaneous CT-guided radiofrequency ablation. Under CT guidance, an electric-driven bone biopsy needle (Oncontrol, Teleflex) was advanced through the reactive bone into the nidus of the OO (Fig. 5). A sample was taken. The course after treatment was uneventful. A control MRI was performed 3 months after intervention (Fig. 6). The patient had significant pain relief immediately after intervention and has remained without symptoms in a 1 year's follow-up.

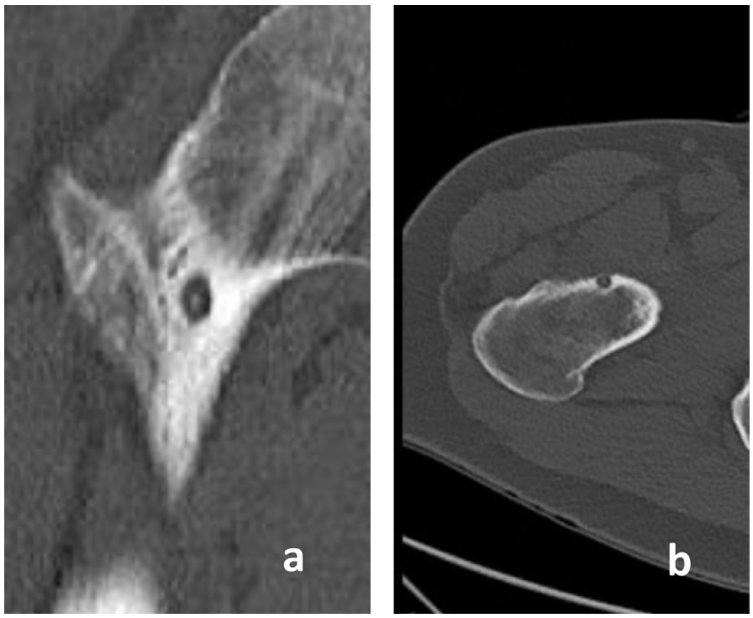

Fig. 3 – CT scan (coronal plane) reveals the characteristic nidus with a hypodense part in the femoral neck with coronal plane (A) and axial plane (B).

Fig. 4 – 3D reconstruction again illustrates a nidus-like lesion in the femoral neck.

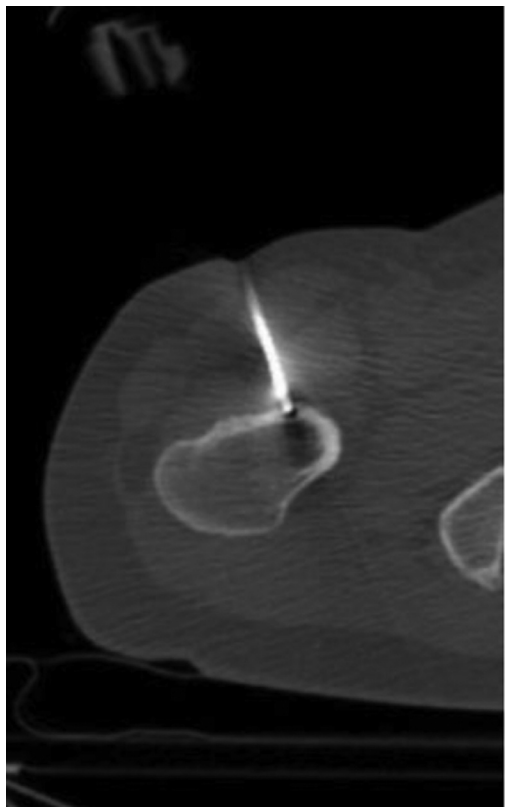

Fig. 5 – CT-guided radiofrequency ablation was performed after assessment of the correct positioning of the needle.

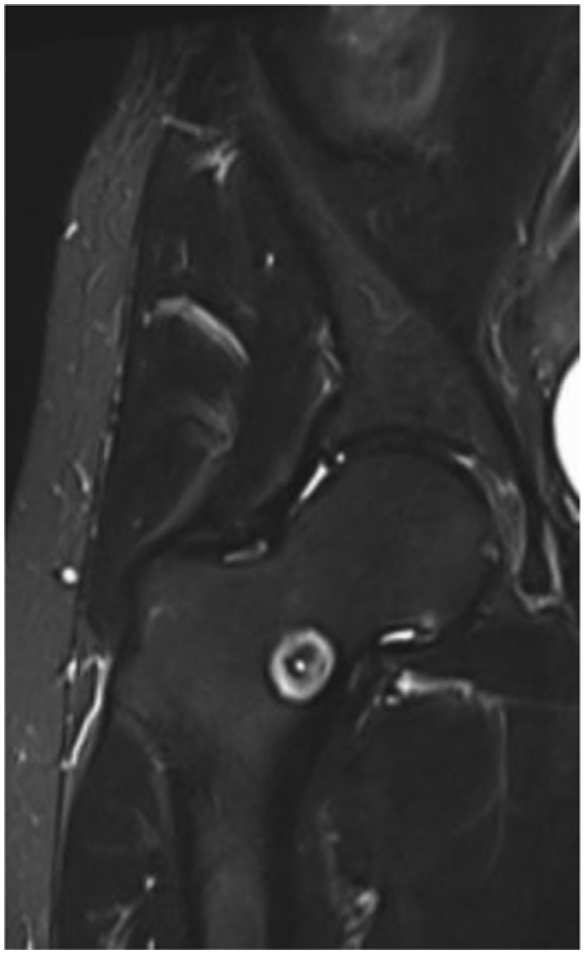

Fig. 6 – Three months postoperative MRI (T2-weighted TIRM sequence).

Discussion

OO of the femoral neck is a rare diagnosis that may lead to painful restriction of hip motion. It accounts for 10% to 14% of all benign bone tumors [1,2]. OO can affect any bone, but is mostly seen in the long bones of the lower extremities [2,3]. It was first mentioned by Jaffe in 1935 [4]. At least 25% to 27% of OO are located in the proximal femur [5]. The most common symptoms of an OO are recurrent dull hip pain in varying degrees and limping. Severe pain typically occurs at night, also affecting sleep quality [6] and can be reduced with nonsteroidal anti-inflammatory drugs [7]. Early diagnosis and proper treatment can be delayed due to confusing clinical and radiological features such as BME, pain, joint effusion, tenderness, and limited range of motion [8–11]. Delayed treatment may cause changes in bone morphology as well as secondary osteopenia [8].

Frequently, evaluation of hip pain includes radiographs and MRI [12]. However, Pikoulas et al stated in 1995 that all patients with suspected OO should have a CT scan because of its higher sensitivity and specifity compared to plain radiographs or MRI [9,13]. Nonetheless, MRI can give useful information to define changes to the labrum or cartilage and to differentiate between OO and osteomyelitis as well as other tumors [12]. Pain control can be achieved with nonsteroidal anti-inflammatory drugs as part of conservative treatment [7,14,15]. Various treatment options for OO have been established. Open surgery for excision of the nidus is the classic treatment for OO. Rosenthal et al showed the essential equivalent of open surgery and CT-guided percutaneous ablation in the treatment of OO [16,17]. Arthroscopic excision of the nidus is another useful treatment option that became more widely used during recent years with excellent pain relief, but it should be performed in instances where the location of the lesion precludes percutaneous techniques [18,19]. The advantages of CT-guided percutaneous methods are rapid recovery and low complication rates, but they have their own limitation, since they require advanced instrumentation [20]. Radiofrequency ablation can lead to good results in terms of pain relief [21] while avoiding the risks of arthroscopy or open surgery.

In retrospect, the small lucency could have been noticed by more careful inspection of the plain anterior-posterior hip radiography. In our case, only the characteristic high signal lesion as seen in T2-weighted turbo inversion recovery magnitude (TIRM) sequence in one sequence (Fig. 2B) aroused suspicion and led to the decision to perform CT following prescribed treatment procedures as recently proposed by [22]. One reason for delayed evaluation and decision-making could have been the patient's age as OO is most commonly seen in the second and third decades of life. The osseous pathology was underestimated on MRI in the presented case and BME led to incorrect diagnosis of BME. The particular case emphasizes the value of CT scans diagnosing an OO.

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