

Osteoid osteoma mimicking tuberculosis and juvenile idiopathic arthritis – a case report

Kostniak kostnawy w masce gruźlicy i młodzieńczego idiopatycznego zapalenia stawów – opis przypadku

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CASE REPORT

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Abstract

Osteoid osteoma is a common benign bone tumor. The classic presentation includes nocturnal pain that responds well to nonsteroidal anti-inflammatory drugs. Osteoid osteoma can mimic many conditions, including juvenile idiopathic arthritis, infection, malignant neoplasm, and post-traumatic condition. We present the case of a 14-year-old girl with a months-long history of pain with limited mobility of the left hip joint. The patient was subject to several incorrect diagnoses followed by incorrect treatment pathways. Initially, a post-traumatic condition was diagnosed, then latent tuberculosis and juvenile idiopathic arthritis. Numerous hospitalizations, laboratory and imaging studies, and inappropriate treatment delayed the diagnosis and appropriate management by 2 years. Ultimately, a CT scan of the hip joints enabled the correct diagnosis to be made. Thermal ablation with intraoperative 3D navigation was utilized to successfully treat the lesion.

Key words: osteoid osteoma, bone tumor, tuberculosis, juvenile idiopathic arthritis, computed tomography, radiofrequency ablation.

Streszczenie

Kostniak kostnawy jest częstym łagodnym nowotworem kości. Klasyczna prezentacja objawów obejmuje ból nocny, dobrze reagujący na niesteroidowe leki przeciwzapalne. Kostniak kostnawy może naśladować wiele schorzeń, m.in. młodzieńcze idiopatyczne zapalenie stawów, infekcję, nowotwór złośliwy, stan pourazowy.

Prezentujemy przypadek 14-letniej dziewczynki z wielomiesięczną historią bólu z ograniczeniem ruchomości lewego stawu biodrowego. Pacjentka przeszła kilka nieprawidłowych ścieżek diagnostyczno-leczniczych. Początkowo rozpoznano stan pourazowy, następnie gruźlicę latentną oraz młodzieńcze idiopatyczne zapalenie stawów. Liczne hospitalizacje, badania laboratoryjne, obrazowe oraz niedostosowane leczenie spowodowały opóźnienie rozpoznania i wdrożenie odpowiedniego postępowania o 2 lata. Ostatecznie wykonanie badania TK stawów biodrowych umożliwiło postawienie prawidłowego rozpoznania. Wyleczenie uzyskano za pomocą ablacji termicznej z śródoperacyjną nawigacją 3D.

Słowa kluczowe: kostniak kostnawy, guz kości, gruźlica, młodzieńcze idiopatyczne zapalenie stawów, tomografia komputerowa, ablacja prądem częstotliwości radiowej.

Introduction

Osteoid osteoma (OO) is a benign bone tumor, usually affecting patients before the age of 20 years [1-3]. It is the third most common benign bone tumor and is particularly prevalent in Caucasian adolescents and young adults [4,5]. OO accounts for approximately 3% of all primary bone tumors, occurring several times more frequently in males [6,7].

Osteoid osteoma classically presents as a single, round lytic lesion (nidus) usually up to 1 cm in size, surrounded by an area of sclerotic bone. It is usually located in the metaphysis of a long bone, most commonly the femur [8].

The classic presentation of OO is nocturnal pain that responds well to nonsteroidal anti-inflammatory drugs [9]. Depending on the location of the lesion, patients may report local swelling, tenderness, and gait disturbance [10].

Many musculoskeletal conditions may exhibit clinical and radiographic features that mimic OO [5]. Osteoid osteoma can be misdiagnosed as arthritis, avascular necrosis of the femoral head, fatigue fracture, tuberculous arthritis, or juvenile idiopathic osteoarthritis [11]. Delay in diagnosis can lead to muscle atrophy, growth disturbances, or joint contractures [12,13].

Case presentation

A 14-year-old girl was admitted to the Department of Trauma and Orthopaedic Surgery with a range of motion limited by pain in her left hip. The girl associated the onset of symptoms with trauma during physical education classes. She had left hip pain for 7 months, and limping for 4 months. The X-ray was normal. Labral injury of the left hip joint was under suspicion. The patient was admitted to the Department for MRI. Findings included a significant amount of effusion in the left hip joint, thickened synovial membrane with accompanying swelling of the left femoral neck marrow, suggesting features of synovitis. The above MRI interpretation did not include the description of a small lesion located in the left femoral neck (Fig. 1).



Fig. 1. Initial MRI scan – image consistent with an osteoid osteoma in the left femoral neck scan. The lesion was overlooked.

The patient was hospitalized in the Pediatric Department with suspected left hip arthritis. The treatment included NSAIDs and antibiotics – clarithromycin and cefuroxime.

Six months later the girl was hospitalized in the Department of Rheumatology of the Developmental Age with suspicion of unspecified hip arthritis. The patient had severely limited range of motion, pain with ambulation, and unladen movement. Abnormal gait with left lower limb-sparing. Laboratory tests revealed HLA B27 antigen and weakly positive antinuclear antibodies. Positive tuberculin test – 10 mm. The patient was urgently hospitalized at the Pulmonary and Tuberculosis Treatment Center with a diagnosis of latent tuberculosis.

With suspected tuberculous hip arthritis, the patient was admitted to the Department of Pediatric Orthopaedics and Traumatology for repeat MRI, bone and synovial biopsy, and culture. MRI scan showed the same image as the previous one. The cultures were negative, synovitis in the biopsy material. The patient was again hospitalized at the

Center for Lung Disease and Tuberculosis. The patient was started on isoniazid with the recommendation to continue the treatment for 9 months.

One month later the patient was again hospitalized in the Department of Rheumatology of the Developmental Age with the same symptoms as above and left hip joint flexion contracture. Juvenile idiopathic arthritis was diagnosed with the presence of HLA B27 antigen. Methotrexate was administered subcutaneously (20 mg/week) and the anti-tuberculosis treatment was maintained.

The patient was treated in the Institute of Rheumatology 10 months after the first hospitalization. The patient had a history of left hip joint pain at night and in the morning. On physical examination, the range of motion improved, but flexion contracture and rotation restrictions persisted. An ultrasound examination was performed with a description of a slight deformation of the left femoral head. An increased dose of methotrexate (25 mg/week) and maintenance of antituberculosis treatment were recommended.

The patient was hospitalized several times at the Institute of Rheumatology over the next year with periodic improvements in range of motion. In the control USG chronic inflammatory process with coexisting degenerative changes. In the control MRI, active inflammation of the left hip joint with slight coronary osteophytosis of both femoral heads may cause acetabular-femoral conflict. Chloroquine phosphate was included in the treatment. At the next hospitalization, ultrasound image as before, MRI image normal. Chloroquine treatment was discontinued, sulfasalazine treatment was started, methotrexate treatment was maintained. The patient was scheduled for another hospitalization 3 months later in order to qualify for biological treatment and was referred to the orthopedic clinic with suspicion of acetabular-femoral conflict.

During the next hospitalization (21 months after the first hospitalization and 28 months after the first symptoms) several laboratory and imaging examinations were performed again. A CT scan of the hip was performed for the first time during long-term and extensive treatment. The imaging showed an osteolytic lesion, 7 mm. in the posterior-basal part of the left femoral neck (Fig. 2A-B). The lesion was located in the cortical layer of the bone, with central inflammation - a picture typical for osteoid osteoma. Osteoid osteoma of the left femur was diagnosed.

4 months later, thermoablation of the tumor using intraoperative 3D navigation at 90°C for 6 min was performed at the Department of Pediatric and Adolescent Orthopaedics and Traumatology (Fig. 3A-C). Without complications during and after the procedure. After the thermoablation procedure, complete resolution of pain symptoms was achieved, and the range of motion of the left hip joint improved in the following months. In the follow-up examination six months after the procedure, there was no recurrence of symptoms in both clinical examination and imaging studies.

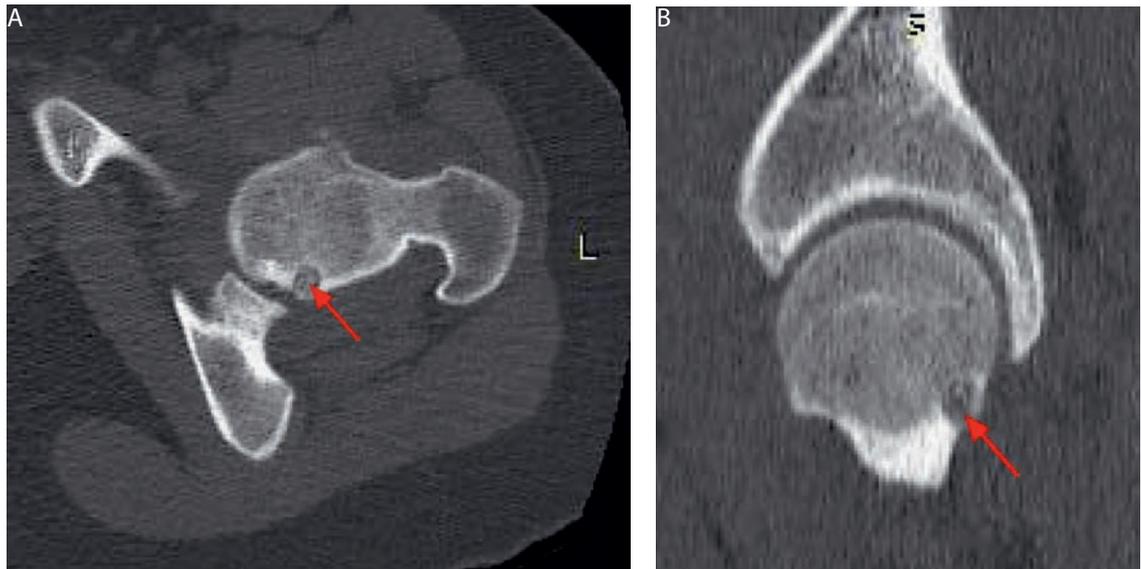


Fig. 2A-B. CT scan. Osteoid osteoma is visible in the left femoral neck.

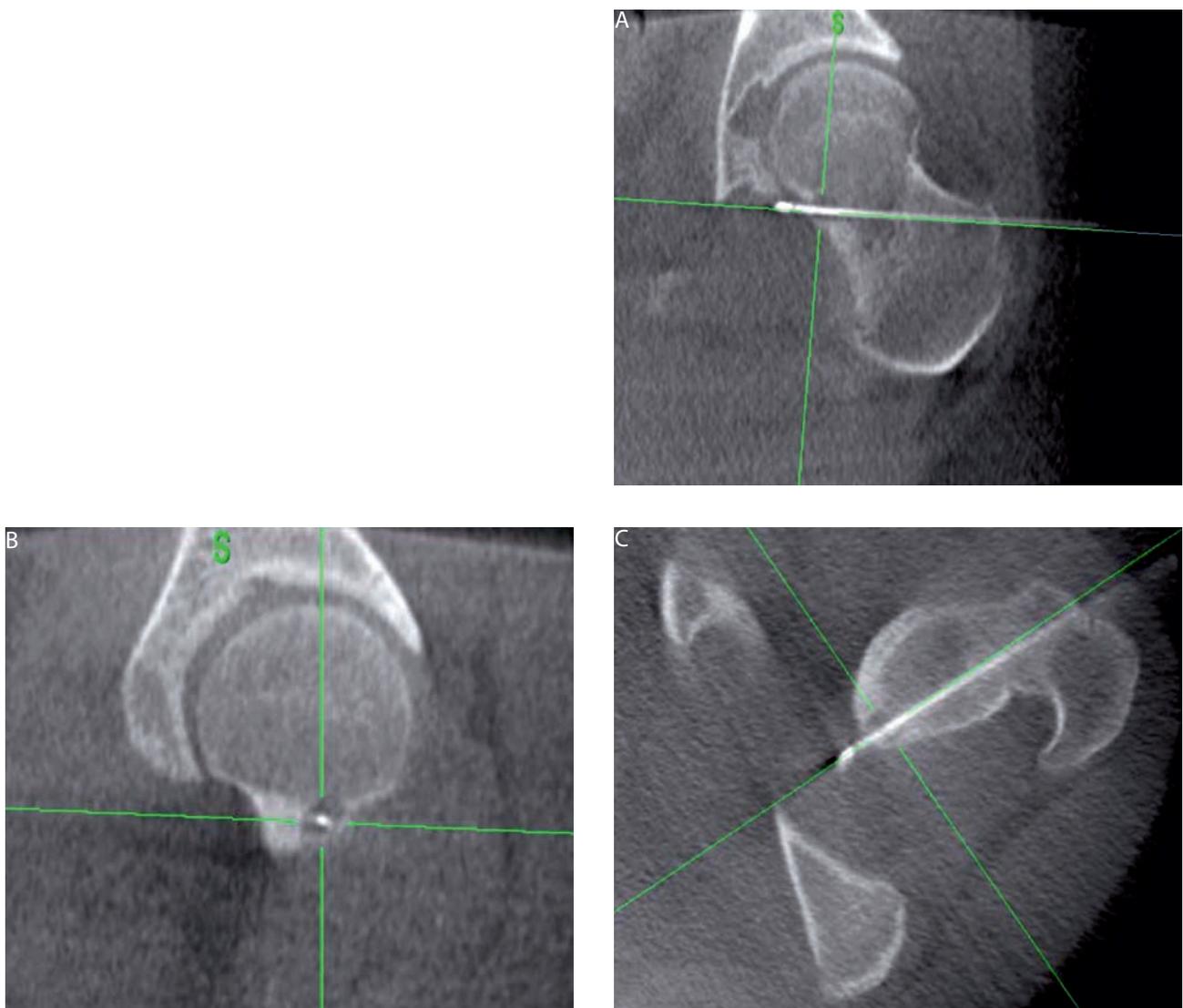


Fig. 3A-C. Thermal ablation with intraoperative 3D navigation.

Discussion

Osteoid osteoma may mimic rheumatologic diseases, particularly juvenile idiopathic arthritis. [14] Another common misdiagnosis is tuberculosis. Radiographic changes on standard radiographs in joint tuberculosis are absent or nonspecific in the early stages of the disease, so it is not a sufficient test to differentiate tuberculosis and OO [11]. Diagnosis is often delayed for months or even years [15].

Our study presents the patient who underwent multiple misdiagnostic pathways, despite she had osteoid osteoma with typical location and symptoms. The patient was hospitalized 12 times, underwent 4 MRI scans and numerous other imaging and laboratory studies. The diagnosis was delayed for almost 2 years, exposing the patient to a prolonged period of discomfort, stress, discomfort, costs, and side effects of the applied treatment for the misdiagnosed conditions.

Pain is not always clearly localized. It can radiate in any direction. In rare cases, OO may even occur without pain. Intra-articular or adhesion-related OO is associated with nonspecific, misleading symptoms such as joint effusion, synovitis, and limited mobility. The clinical presentation in this case often includes limp [16]. The leading symptom of osteoid osteoma located intra-articularly or appendicular is the painful restriction of joint mobility with features of synovitis of the joint. This symptom is not observed with osteoid osteoma located extra-articularly [17].

OO is often not recognized on classic radiography due to its small size [16]. While MRI is often the method of choice for the diagnosis of hip pain, the diagnostic accuracy of MRI in detecting atypical OO is significantly lower than that of CT. OO can be difficult to identify on MRI, and images can easily be misinterpreted. In particular, unexplained areas of bone marrow edema require further imaging studies (CT) [18,9]. MRI may also fail to visualize tumors in the early stages. CT is the study of choice in any suspected osteoid osteoma [12]. The flagship symptom of nocturnal pain relieved by salicylates is an indication for a CT scan of the area. Bone scintigraphy is particularly useful in the search for an active focus [19,3].

Thermal ablation with intraoperative 3D navigation is currently the treatment of choice for osteoid osteoma for pediatric patients because it is safe, effective, and minimally invasive [17,20]. Thermal ablation is a minimally invasive treatment option that provides immediate results with low complication and recurrence rates [21,22].

Conclusion

Some osteoid osteomas are difficult to diagnose due to nonspecific presentation and misleading diagnostic findings. Clinicians and radiologists should be aware of the misleading imaging findings of osteoid osteoma, especially

when located in the joint region. Computed tomography is the study of choice for diagnosis and should be performed early in the differential diagnosis of osteoid osteoma.

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