

Radiological Case Report / Caso Clínico

Intraarticular Osteoid Osteoma of the Elbow – A Challenging Case*Osteoma Osteóide Intra-Articular no Cotovelo – Um Desafio Diagnóstico*Natália Ferreira¹, António Costa², Ana Ferreira¹, Artur Duarte³, José Fonseca Santos⁴

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Abstract

Osteoid osteoma is a common bone tumor, usually found in young patients. Intraarticular locations are rare, occurring in approximately 13% of cases. The most commonly involved joint is the hip, while the elbow is less commonly affected.

Intraarticular osteoid osteoma may be associated with atypical clinical features and imaging findings that often differ from the classical hallmarks of extraarticular lesions.

Patients with osteoid osteoma of the elbow frequently present pain, chronic synovitis, joint effusion and limitations in motion, simulating inflammatory arthropathy. Additionally, in intraarticular lesions, reactive cortical thickening or sclerosis is minimal or absent giving a subtle radiographic appearance that often delays the diagnosis. Careful search for history data and extensive imaging procedures with computed tomography, bone scintigraphy and magnetic resonance can lead to the correct diagnosis.

The case of a young male with an osteoid osteoma of the elbow is presented.

Keywords

Osteoid osteoma; Bone neoplasms; Diagnostic imaging; Tomography; Magnetic resonance imaging

Resumo

O osteoma osteóide é um tumor ósseo comum que ocorre predominantemente em jovens. A localização intra-articular é rara, surgindo em cerca de 13% dos casos. A anca é a articulação mais vezes envolvida, enquanto que o cotovelo é uma localização menos comum.

O osteoma osteóide intra-articular pode apresentar-se com manifestações clínicas atípicas e achados imagiológicos que diferem dos sinais clássicos das lesões extra-articulares.

Os casos de osteoma osteóide do cotovelo frequentemente cursam com dor, sinovite crónica, derrame articular e limitação de movimento, simulando uma artropatia inflamatória. Acresce que nas lesões intra-articulares o espessamento cortical ou esclerose podem ser mínimos ou ausentes, dificultando a deteção das lesões pela radiografia. A avaliação detalhada da história clínica e o recurso a métodos de imagem como a tomografia computadorizada, cintigrafia óssea e ressonância magnética são essenciais na abordagem diagnóstica.

Os autores apresentam um caso de osteoma osteóide do cotovelo num jovem do sexo masculino.

Palavras-chave

Osteoma osteóide; Tumores ósseos; Diagnóstico radiológico; Tomografia; Ressonância magnética.

Introduction

Osteoid osteoma is a relatively common bone lesion and corresponds to approximately 10-12% of all benign bone tumors.¹ It is usually found in young individuals between the ages of 7 and 25 years and men are more frequently affected than women.^{1,2} Patients often show pain that worsens at night and is relieved by the administration of salicylates.¹ Osteoid osteoma is preferentially found in the diaphysis of the femur and the tibia.³

Intraarticular osteoid osteoma, which occurs within or near a joint, is rare and considered a separate clinical entity.^{2,4} Intraarticular locations may be associated with atypical clinical features and imaging findings often differ from those of intracortical osteoid osteoma.² When intraarticular, reactive cortical thickening or sclerosis is minimal or absent giving a subtle radiographic appearance that often leads to delay of diagnosis.⁵

Computed tomography (CT) is the method of choice to identify the nidus, whereas magnetic resonance imaging (MRI) is the best technique to identify changes in the intramedullary area and in the soft tissues adjacent to the lesion.⁶

We present a case of a boy with an intraarticular osteoid osteoma of the elbow.

Clinical History

A 15-year-old male presented progressive, mild intensity pain and stiffness of the elbow for a 3-month period. There was no history of trauma and his past medical history was unremarkable. On physical examination, the patient reported pain on elbow motion. The plain film did not reveal significant findings.

An ultrasonography of the elbow was performed, revealing hypoechoic synovitis with associated hyperemia on the

color Doppler evaluation and a small joint effusion (fig. 1). Intense pain was produced when the transducer was pressed over the area of the synovitis.

The patient underwent a contrast-enhanced MR imaging examination. A small, round cortical lesion with intermediate signal intensity on T1- and T2-weighted MR images and modest enhancement was noticed in the coronoid fossa of the distal extremity of the elbow (fig. 2). Bone marrow edema adjacent to the lesion, synovitis and mild joint effusion were also present (fig. 2). The diagnosis of osteoid osteoma was suspected.

Finally, a CT was performed, revealing a 15-mm lytic lesion with a central radiolucent nidus that contained a calcified center, located in the coronoid fossa of the distal extremity of the elbow, bulging through the cortical bone (fig. 3). Periosteal reaction and subtle cortical thickening was noted. The CT findings confirmed the diagnosis of intraarticular osteoid osteoma.

After the lesion was surgically removed, the patient remained asymptomatic.

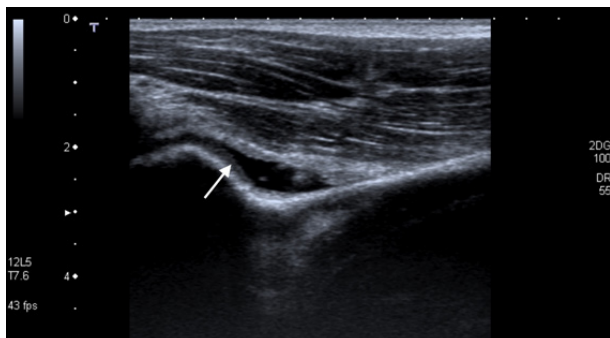


Figure 1 – Ultrasound of the elbow depicting synovitis (arrow) with mild joint effusion.



Figure 2 – MRI of the elbow. Sagittal images on T1 TSE (a) and PD TSE SPAIR (b) show the nidus with isointense signal on T1 and slightly hyperintense signal on proton density weighted images (arrow). Note periosteal reaction (curved arrows) and synovitis with mild joint effusion (*). Axial T1 SPIR after gadolinium administration (c) depicts slight enhancement of the nidus (arrow). Adjacent bone marrow edema is also observed.

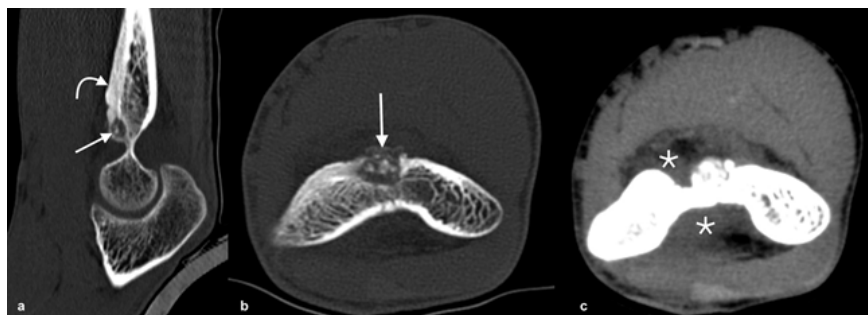


Figure 3 – CT of the elbow. Sagittal reconstruction (a) demonstrates the presence of the radiolucent nidus in the coronoid fossa (arrow) and prominent periosteal reaction (curved arrow). Axial CT image with bone window (b) show the 15-mm diameter radiolucent nidus (arrow) that contains a calcified centre. On axial CT image with soft tissue window (c) mild joint effusion is identified.

Discussion

Approximately 13% of osteoid osteoma arise within a joint.⁷ This tumor is considered to be intraarticular when it occurs at the extremity of long bones, around or within the joint, in a bone limited by the capsule, very close to it

and to the synovia¹. The most commonly involved joint is the hip, while the ankle, elbow, wrist, and knee are less commonly affected.²

In intraarticular osteoid osteoma, clinical symptoms can be different from the classical hallmarks of extraarticular lesions. The pain is not necessarily worse at night and may not be relieved by salicylates.⁷ Additionally, joint tenderness and effusion may be prominent, contributing to the diagnostic confusion.²

Patients with osteoid osteoma of the elbow frequently present pain, chronic synovitis, joint effusion and limitation in range of motion, simulating inflammatory arthropathy,¹ as in this case. Furthermore, the radiological findings can be uncharacteristic and misleading.

At plain film and CT, osteoid osteoma is typically depicted as a well-defined, round or ovoid lytic lesion, called nidus, that is surrounded by an area of bone sclerosis and/or reactive cortical thickening.² CT is the method of choice to identify the nidus of an intra- or juxta-articular osteoid osteoma.³ In the center of the nidus a focus of high attenuation can be seen, a feature corresponding to mineralized osteoid. In cases of intraarticular involvement, reactive cortical thickening can be minimal or absent,^{1,5} reason why sometimes it is difficult to identify it on the plain film.

On MR imaging, the nidus shows low or intermediate signal on T1-weighted images and has variable signal on T2-weighted images.² High signal in the bone marrow and soft-tissue abnormalities on T2-weighted images may be found adjacent to the lesion.² Compared with CT, MRI is less sensitive to depict small nidi because the signal is similar to that in cortical bone¹. Enhancement of the nidus may be seen both in CT and MRI after contrast intravenous administration.

On bone scintigraphy, the tumour presents a typical pattern known as “double density” sign: intense activity centrally in the nidus region and less intense activity in the periphery of the lesion.³ However, bone scintigraphy often fails to visualize the nidus and shows unspecific findings.⁶

The differential diagnosis for osteoid osteoma of the elbow include: monoarthritis, osteochondritis dissecans, osteomyelitis, chondroblastoma and osteoblastoma. Complete nidus excision is curative and is the most traditional treatment method. However, minimally invasive techniques, such as radiofrequency ablation, have also been proved safe and effective alternatives.³ There's also evidence that osteoid osteoma may resolve spontaneously over time

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and can be treated conservatively with nonsteroidal anti-inflammatory drugs in certain patients.³

In conclusion, clinicians and radiologists should be aware of the potentially confusing clinical and imaging findings associated with intra-articular osteoid osteoma. Careful search for history data and extensive imaging procedures can lead to the correct diagnosis.

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