Calcaneal Osteoid Osteoma Hidden by Confusing Symptoms in a 18 Years Old Basketball Player: A Case Report

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Osteoid osteoma is a small common benign osteoblastic tumor. Foot osteoid osteomas represent a minority of cases. Patients are usually male children and young adults within the third decade. In our case report we describe an osteoid osteoma of the calcaneus in a young adult, semi-professional basketball player. Starting from the case description, we aim to: 1) Analyse the reasons of initial misdiagnosing, also due to misleading previous sport injury, and potential mimickers, 2) Discuss the different conservative and surgical therapeutic options.

The clinical case presented here suggests that close collaboration between general practitioner and physical therapist could lead to a faster correct management of this rare disease. Osteoid osteoma should be considered in differential diagnosis when chronic foot pain, in children or in young adults, doesn’t improve with conservative treatment.

Keywords: Osteoma; Osteoid; Differential diagnosis; Sport medicine; Musculoskeletal disease

Introduction

Osteoid osteoma is a small common benign osteoblastic tumor accounting for approximately 10-15% of all benign bone tumors [1-3]. This bone-forming lesion mostly appears in the lower extremities (65% of cases) where femur and tibia are the most frequent sites of manifestation. Foot osteoid osteomas represents a minority of cases (4%-16% prevalence), mainly localized in the talus [1,3-5]. This pathology usually affects children and young adults within the third decade [1,2,6] and males are from 2 to 3 times more affected than females [6].

Usually local pain exacerbating at night and improved by the assumption of NSAIDs, especially salicylates, [1,2,6,7] is the main symptom. However, when the site of presentation of the tumor is intra or juxta-articular (lesions surrounded by or very close to the joint capsule and synovium), it can clinically mimic a more widespread disorder, due to chronic articular pain. Less commonly, the pain is associated with symptoms like swelling, joint stiffness, contracture and limping [2,3,6]. Osteoid osteomas may heal spontaneously, but this process may take several years. The available therapeutic options are the conservative management of pain by NSAIDs or the surgical intervention [2,4].

Starting from the case description, we aim to: 1) analyse the reasons of initial misdiagnosing, also due to misleading previous sport injury, and potential mimickers, 2) discuss the different conservative and surgical therapeutic options.

Case Report

The patient is a normal-weighted Caucasian 18-year-old male, student and basketball player, who consulted a physical therapist at a private outpatient clinic for pain in the right ankle that prevented him to train.

During the history taking the patient reported to have suffered six months earlier of a grade I [8] inversion sprain of the right ankle. Pain and disability related to the ankle sprain were managed through PRICE protocol (Protection, Rest, Ice, Compression and Elevation), taking non-steroidal antiinflammatory drugs (NSAIDs) for three days and a short program of proprioceptence exercises, with a complete resolution of symptoms in three weeks.

Two months ago, in absence of trauma, after an intense pre-seasonal training session, a slight pain in the midfoot reappeared. The pain gradually increased and in the last four weeks it was so intense (NRS 8 out of 10) to lead the patient to suspend his training. There were no other associated symptoms; family history and psychosocial conditions were not relevant. The x-rays of the right foot, prescribed by the general practitioner were negative for stress fractures and a written report of a magnetic resonance of the right foot, self-prescribed by the patient, described an oedema of the third and fourth metatarsal bone.

Inspection did not reveal signs of inflammation and palpation any ligaments involvement. Active range of motion was complete and painless, both in non-weight-bearing and in weight-bearing position. Manual strength tests were also painless and negative for any muscle. The passive range of motion examination demonstrated slight diffused end-feel stiffness in the hindfoot and the midfoot, without a specific direction of restriction. Repetitive strain injury, related to stiffness caused by previous ankle sprain apparently was the most probable diagnostic hypothesis emerged after the clinical evaluation.

Passive ankle and midfoot joints mobilisations were performed for three times a week for 15 days with the aim of reducing pain by improving the only evident sign (mild stiffness) without any improvement. Therefore, the physical therapist decided to retake a more depth history, which revealed sleep difficulties, due to pain, that occurred several times in the last week unrelated to the treatment.

The new information of the nocturnal non-mechanical pain was discussed with general practitioner and it was decided to administrate NSAIDs therapy to check responsiveness of pain to drugs, to support or refute the hypothesis of inflammatory disease.

After taking acetylsalicylic acid before sleeping for one week, night pain almost disappeared and also day pain significantly improved.

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confirming the suspected inflammation.

Definitive diagnosis was made following a magnetic resonance imaging (MRI) and a computed tomography (CT) assessment, which revealed a quite rare intra-medullary osteoid osteoma of the calcaneus (Figures 1 and 2).

Thereafter, the patient was treated by percutaneous CT-guided radiofrequency thermoablation. Immediately after discharge, the patient resumed weight bearing as tolerated. Complete weight-bearing sport training started after 30 days. Symptoms entirely disappeared within the two following months.

Discussion

Osteoid osteomas arising in short bones of the foot and the hand are often intramedullary, typically juxta-articular [2]. Because of complementary nonspecific symptoms in intra-articular or juxta-articular osteomas (chronic articular pain, swelling, joint stiffness, contracture and limping), the delay in diagnosis is often more than one year [1-4,6,7]. Moreover, if the patient has a history of injury; the initial diagnosis is even more difficult to make, as it is natural for the physician to attribute the symptoms to the previous trauma [7].

Possible differential diagnosis are inflammatory arthropathy, stress fracture, osteomyelitis, aggressive bone tumour, anterior or posterior ankle impingement, reflex sympathetic dystrophy, chronic ankle sprain, os trigonum syndrome, tarsal coalition, sinus tarsi syndrome and bone cyst [1-4,6].

A delayed diagnosis could expose the patient to an even minimal, risk of malignancy. Although, the osteoma osteoid generally seems to be a self-limiting or with little growth potential tumor [9]; malignant transformation into aggressive osteoblastomas has been reported [10]. Moreover, the persisting pain and suffering can have an important impact on disability and quality of life of the subjects that stay for long without a definitive diagnosis.

Responsiveness to NSAIDs can be suggestive of any inflammatory disease, and is often seen in osteoid osteomas. However the definitive diagnosis can be made only with CT imaging, in which pathognomonic findings (nidal calcification and perinidal sclerosis) are considered the gold standard [1-3,6,7]. Radiographies, being cost-effective for a large number of pathologies and less invasive than CT, are often the first imaging approach to identify bone involvement. Notably some authors found that all lesions they investigated in the hindfoot were radiographically occult, probably as consequence of the complex anatomy combined with the lack of periostal reaction in this site [1], and our case report confirm this assertion. Authors agree that MRI that can show only diffuse edema localized to a single bone with soft tissue edema is less specific than CT [1-3,5-7]. Moreover, in clinical conditions characterized by chronic foot pain with a normal radiographic exam, MRI is likely to be the next investigation to point out soft tissue signs. In the present clinical case, MRI together with negative radiographies, history of a recent trauma and a slight restriction of ankle mobility, had a misleading role and delayed the diagnosis.

Although some evidence suggests that osteoid osteomas may regress spontaneously, this process may take several years and pain management with NSAIDs medication, excluding in fact this option for paediatric patients [1,4-6] or for an athlete as in our case. Surgical choice provides immediate and complete pain relief in high percentage of cases [2,4]. Complete excision of the nidi is less frequently performed [5] while percutaneous procedure like CT-controlled percutaneous drill resection [11], Ethanol Injections [12], Laser Ablation [13], Thermocoagulation [14] and radiofrequency thermoablation [15,16] are more used. Among these options seems that CT-guided percutaneous radiofrequency thermoablation is a successful and less invasive treatment [15,16], with more rapid weight-bearing recover [2].

Conclusion

Intramedullary osteoid osteomas (e.g. in the calcaneum) namely when close to a joint, are difficult to diagnose. Such small bony lesions may manifest as a joint disease. Initial radiographic examinations can be normal, delaying the correct diagnosis. A previous history of local trauma can be additionally misleading. Suspicion should arise when
young patients present with chronic joint pain, not responding well to usual care [1-4,6,7]. The CT-guided percutaneous radiofrequency thermoablation seems to be the best therapeutic option in most cases, avoiding a long lasting NSAIDs therapy and allowing for a rapid recovery of full abilities of the young patient.

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References