

Case Report

Synovial chondromatosis as an etiology of ankle impingement: a case report

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Abstract

Anterior ankle impingement is a common cause of chronic pain in this site and has synovial chondromatosis, albeit rare, as one of its possible etiologies. Both arthroscopic approach and open arthrotomy are reported as therapeutic option, but the few published data showed that the first is believed to bring more advantages. In a recent study, one of the limitations found by the authors was the rareness of this condition in the ankle, and thus the small number of publications on the topic. We present the rare case of synovial chondromatosis of the ankle in a middle-aged man, which was clinically manifested as anterior impingement syndrome and treated arthroscopically, showing an atypical arboriform vascularization pattern.

Level of Evidence V; Diagnostic Studies; Expert Opinion.

Keywords: Ankle joint; Chondromatosis, synovial; Arthroscopy.

Introduction

Anterior ankle impingement is a common cause of chronic pain in this joint. It is described as a syndrome that causes anterior ankle pain and restricted dorsiflexion, resulting from impingement of talotibial osteophytes or soft tissues⁽¹⁾.

Synovial chondromatosis of the ankle, one of the etiologies of anterior impingement, is a rare proliferative metaplastic synovial disease, of intra or extra-articular manifestation, which induces the formation of cartilaginous loose bodies within the joint space and may affect the anterior compartment, the posterior compartment, or both. This type of chondromatosis more often affects the knee, the elbow, and the hip, being less reported in the ankle⁽²⁾. It may also affect soft tissues, such as tendon sheaths and bursae^(2,3).

Clinically, when chondromatosis is concentrated on the anterior compartment of the ankle, it manifests with signs and symptoms typically observed in anterior impingement syndromes: pain, edema, and limited range of motion, especially dorsiflexion⁽¹⁾. Therefore, synovial chondromatosis, albeit rare, should always be considered as a possible etiology of impingement syndromes.

In a systematic review conducted in 2020 by Al Farii et al.⁽⁴⁾ on the arthroscopic management of ankle synovial chondromatosis, one of the limitations presented by the authors was the rarity of this condition in the ankle, and thus the low number of publications addressing this topic.

The present report describes a rare case of ankle synovial chondromatosis clinically manifested as anterior impingement syndrome and treated arthroscopically, exhibiting an atypical arboriform vascularization pattern.

Case Description

This study was submitted to the institutional Research Ethics Committee linked to Brazil Platform.

A 48-year-old male hypertensive patient, a truck driver, who had been presenting with pain and discomfort on the anterior region of the right ankle since January 2018. There was no history of trauma or previous incidents. According to the patient, the pain increased when walking, standing, and applying manual pressure to the anterior region of the ankle. He also noticed the appearance of a small mass on the anterolateral region and, occasionally, inflammation at the site.

On clinical examination, the patient presented no foot deformities upon weight-bearing and had a usual gait pattern, without claudication. On inspection, edema was found in the anterolateral region of distal tibia. On palpation, no expansive

Study performed at the School of Medicine, Universidade Federal de Alfenas, Alfenas, MG, Brazil.

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lesions were found in the ankle, but intensification of pain on palpation was observed in the anterior distal border of the tibia. With regard to mobility, a restriction of 15 degrees in ankle dorsiflexion was observed, with intensification of pain when this movement was performed in a forced manner. Neurovascular examination was normal.

The patient underwent radiographic tests, which showed anterior tibial articular osteophytosis, in addition to radiopaque loose bodies in the joint space (Figure 1).

Magnetic resonance imaging confirmed osteophytosis in the anterior tibial articular border, joint chondral loose bodies, in addition to extensive synovitis, characterized by hypersignal in T2 (Figure 2).

In view of clinical-imaging suspicion of syndrome of anterior ankle impingement due to synovial chondromatosis and the presence of an evident mass, the advantages and disadvantages of conservative vs surgical treatment were discussed with the patient and a joint decision was made for anterior videoarthroscopic surgical treatment, with diagnostic and therapeutic proposals being discussed simultaneously.

In January 2021, the patient underwent anterior videoarthroscopy of the right ankle, with the classical anteromedial and anterolateral portals. On articular inventory, extensive synovitis was observed in the ankle joint, as well as chondral loose bodies, abundant osteophytosis in the entire anterior border of the tibia, with direct impact on the talus, and an atypical neovascularization pattern covering the chondral surface of the talus and having an arboriform aspect (Figure 3).



Figure 1. Profile radiological scan of right ankle showing anterior tibial articular osteophytosis and radiopaque joint loose bodies.

The following procedures were performed, exclusively by an anterior arthroscopic approach: extensive ankle joint synovectomy, removal of articular free bodies, and of osteotomy of anterior tibial osteophytosis guided by intraoperative fluoroscopy (Figure 4).

Furthermore, cauterization of talar arboriform neovascularization was performed. The resected material was sent to the laboratory for histopathological examination (Figure 5).

The ankle was immobilized with an orthopedic boot and unrestricted protected support.

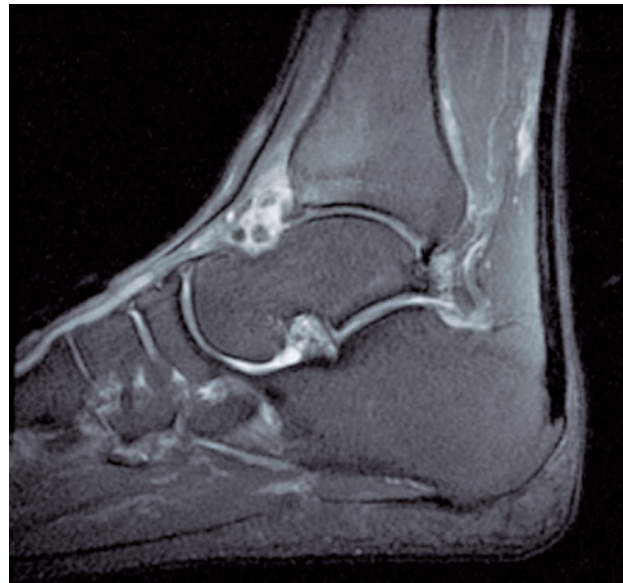


Figure 2. T2-weighted sagittal magnetic resonance image revealing osteophytosis in the anterior tibial articular border, joint chondral loose bodies, and synovitis.

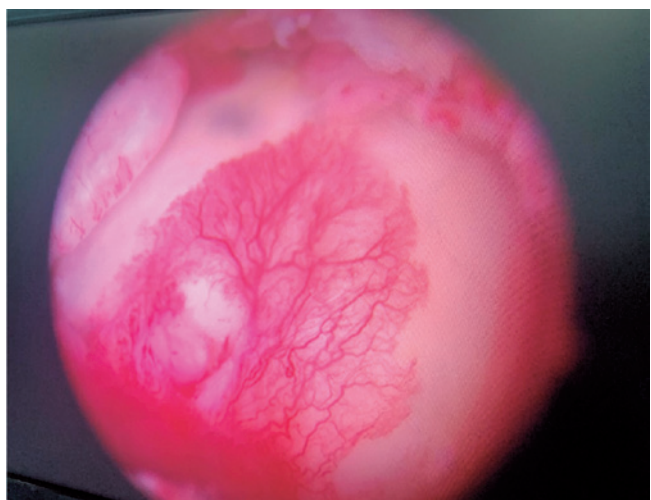


Figure 3. Intraoperative arthroscopic image demonstrating neovascularization covering the chondral surface of the talus and having an arboriform aspect.

On the first postoperative assessment, 1 week after surgery, the patient had already reported improvement in pain symptoms and was satisfied with reduction in anterior ankle edema. At 2 weeks postoperatively, the patient brought the results from histopathological examination, which described multiple firm whitish irregular fragments measuring 2.5 x 2.0 x 1.5 cm in total, consistent with synovial chondromatosis, with no signs of malignancy. At 3 months postoperatively, after physical therapy, the patient showed full improvement of impingement



Figure 4. Profile view of fluoroscopic image of ankle after anterior tibial articular osteotomy.



Figure 5. Joint specimen collected on videoarthroscopy and sent to histopathological examination.

symptoms, improvement of 10 degrees in ankle extension, with no pain or functional complaints. Year patient follow-up was proposed, or earlier in case of appearance of symptoms, due to the risk, albeit low, of potential malignancy.

Discussion

Synovial chondromatosis is a rare joint disease that is even rarer in the foot and the ankle. It affects more men than women, is more frequent between 30 and the 50 years of age, and the role of trauma or genetic predisposition in its etiology has not been elucidated yet⁽⁵⁾. The present report is consistent with these findings, since it described the case of a 48-year-old man with no history of trauma or relevant genetic-hereditary issues. The case series reported by Saxena and St Louis⁽⁶⁾ in 2017 supports these epidemiological data by presenting 2 cases of ankle synovial chondromatosis in male individuals aged from 37 to 43 years old. The most recent systematic review on the topic found a male/female ratio of 3:1, evidencing again the predominance of men⁽⁴⁾.

From the clinical point of view, pain is the most common symptom, and more than a half of patients complain of edema and reduced ankle mobility⁽⁴⁾. These manifestations are typically described in syndromes of anterior ankle impingement, which have several variations described in the literature, such as impingement of bones or soft tissues affecting the anteromedial or anterolateral region⁽¹⁾. In the case reported here, pain was indeed the most disturbing symptom for the patient, who also complained of persistent edema and difficult mobility, especially for extension. Since it is a diffuse hypertrophic synovial disease, with multiples loose bodies in the joint⁽⁴⁾, impingement of bones and soft tissues affected the anterior compartment of the ankle as a whole, not respecting the anteromedial vs anterolateral separation. In the cases reported by Saxena and St Louis⁽⁶⁾, pain and stiffness were also the predominant manifestations; moreover, the observed impingement and degeneration also affected the anterior compartment diffusely.

The present case, as well as those reported by Saxena and St Louis⁽⁶⁾, and 95% of those investigated in the systematic review by Al Farii et al.⁽⁴⁾, were classified into phase 3 chondromatosis, according to the classification described by Milgram⁷, with free loose bodies within the joint. There are no data correlating disease phases, according to this classification, and risk of malignancy.

The treatment of synovial chondromatosis of the ankle is based on patient's age, symptoms, and clinical disease stage⁽⁴⁾. Both arthroscopic approach and open arthrotomy are reported, but the few published data showed that the first is believed to bring more advantages, allowing for a wider visualization, ease of access to more restricted, lower morbidity, earlier recovery, and greater patient's satisfaction. Isbell et al.⁽⁸⁾ describe a case of recurrent disease that, on the second presentation, was managed using arthroscopy [intra-articular approach] and open resection [extra-articular approach], a fact that is confirmed by Mihovil's study employing complete synovial resection. Varied arthroscopy techniques are


reported, but all of them included total synovectomy and excision of joint loose bodies as the core of treatment⁽⁴⁾. When indicated, addition procedures, such as bursectomy, tendon sheath debridement, microfractures, osteochondral lesion debridement, and osteophyte resection are also performed using an open approach⁽⁴⁾. In the case reported here, ancillary procedures involved resection of anterior tibial osteophytes to control the syndrome of anterior bone impingement and complete cauterization of an atypical neovascularization that covered the chondral surface of the talus, as shown in Figure 3, a procedure not often described in the literature. There are no data proving the superiority of the arthroscopic approach over the open approach with regard to recurrence and risks of malignancy.

Although chondromatosis is often a benign condition, differential diagnosis with chondrosarcoma, as well as its potential for malignant transformation, is evidenced in up to 5%

of the cases⁽⁹⁾. Perry et al.⁽¹⁰⁾ reported the case of a woman with calcified joint loose bodies in the knee 13 years after initial trauma. Surgical treatment was total synovectomy, and histopathological analysis revealed grade 2 chondrosarcoma requiring transfemoral amputation. Therefore, histopathological analysis is always necessary, in addition to prolonged patient follow-up⁽⁶⁾.

Conclusion

A joint condition little described in the literature, synovial chondromatosis should always be considered as an etiological hypothesis of syndromes of anterior ankle impingement. More publications on this unusual condition are needed to endorse studies that propose to explore the best therapeutic options for this disease. The bias of this study was its short follow-up, which did not allow us to describe the relationship with recurrence and malignancy.

Authors' contributions: Each author contributed individually and significantly to the development of this article: EASJ *(<https://orcid.org/0000-0002-5054-874X>) conceived and planned the activities that led to the study, wrote the article, interpreted the results of the study, data collection, bibliographic review. *ORCID (Open Researcher and Contributor ID). 

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