

C A S E R E P O R T

Ankle synovial chondromatosis in anterior and posterior compartments. A Case report

Hassan Zmerly^{1,2}, Manuela Moscato^{1,3}, Ibrahim Akkawi³

¹ Orthopaedics and Traumatology Unit, San Pier Damiano Hospital, Faenza, Italy; ² UCM Malta – Ludes Lugano Campus, Switzerland; ³ Orthopaedics and Traumatology Unit, Villa Erbosa Hospital, Bologna, Italy

Summary. Synovial chondromatosis is a rare benign disease, the aetiology of which is not clear. It can arise in the synovial membrane of joints, tendon sheaths, or bursae. Synovial chondromatosis is characterized by multiple loose bodies that can grow and cause symptoms such as pain, swelling and a limited range of motion. It can also result in joint damage. We describe the case of a 48-year-old male dancer with ankle synovial chondromatosis. Diagnosis by radiograph and MRI showed multiple lesions in anterior and posterior ankle compartments. The patient was successfully treated with arthroscopic removal of all loose bodies and partial synovectomy. Clinical follow-ups at one, four and 12 months and again at 10 years, showed the ankle had a full range of motion without pain or swelling. Post-operative radiographs at one month and at 10 years showed no lesions. Synovial chondromatosis is a benign condition with several loose bodies that must be removed to relieve symptoms and avoid future joint damage. The ankle is a rare location for chondromatosis and arthroscopic removal is the treatment of choice with good results. (www.actabiomedica.it)

Key words: ankle synovial chondromatosis, loose bodies removal, arthroscopy, ten years follow-up.

Introduction

Synovial chondromatosis is an uncommon proliferative condition of unknown aetiology, characterized by cartilaginous metaplasia of the synovial cells (1). Synovial chondromatosis is most commonly seen in large joints in males between 20 and 50 years old (2). It is very rare in children (3). The ankle joint represents about 7 % of all locations (4).

Synovial chondromatosis is characterized by multiple loose bodies that can grow and cause symptoms such as pain, swelling and a limited range of motion (5). If non treated, Synovial chondromatosis lead to severe joint damage (4). We report the case of a patient with synovial chondromatosis localized in anterior and posterior ankle compartments, successfully treated by arthroscopic loose bodies removal and partial synovectomy, at ten years follow-up.

Case Report

An active 48-year-old man presented at our Orthopaedic Department with a history of 10 months of pain and swelling in the left ankle. His symptoms were exacerbated by weight bearing and athletic activity. His medical record showed no injuries.

On clinical examination, the ankle joint presented with swelling and pain that was exacerbated by motion. He had a limited range of motion with dorsiflexion of 0 to 20° and plantar flexion of 5°, whereas muscle strength was normal.

Investigations

Serial radiographs of the ankle joint showed lesions in the anterior and posterior compartments with an increase in number and dimension (Fig. 1). Moreover, MRI showed multiple lesions in all compartments and synovial hyperplasia (Fig. 2).

Treatment

The patient underwent ankle arthroscopy under spinal anaesthesia and the use of tourniquet. The patient was treated by standard, first anterior (medial and lateral) and then posterior (medial and lateral) arthroscopic approaches. The arthroscopic examination showed multiple loose bodies with some cartilage fragments still attached to a hypertrophic synovial membrane. The treatment consisted of removing all

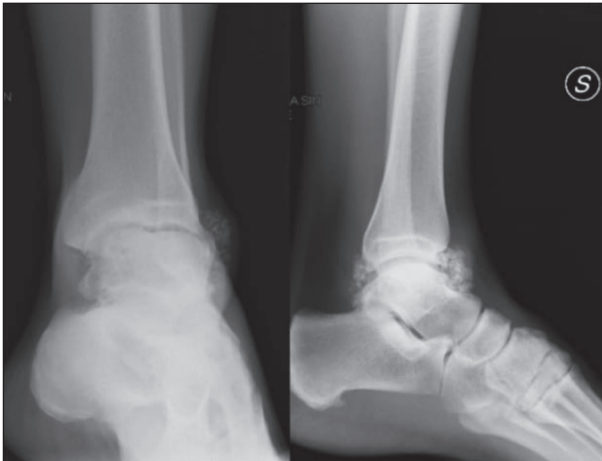


Figure 1. X-ray shows multiple lesions in all ankle compartments with typical characteristic and radio-densities of synovial chondromatosis.

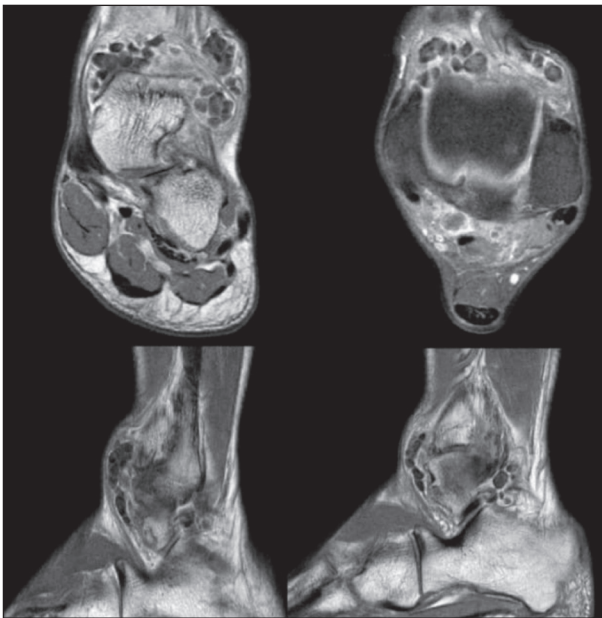


Figure 2. MRI images show multiple loose bodies that are filling and distending the synovial recesses.

loose bodies and partial synovectomy. In supine position with the use of distraction, our first step was loose bodies removal from all compartments through standard anterior ankle arthroscopy portals; then with patient in lateral position we proceed to remove the posterior remaining few larges fragments via posterior portals.

Outcome and follow-up

Post-operatively the ankle joint was passively and actively mobilized and partial weight bearing was allowed as tolerated; the patient was able to return to daily activity after one month. Histopathology showed multiple calcified and ossified loose bodies, with lobules of cartilage in the synovial membrane and confirmed the diagnosis of synovial chondromatosis. At clinical follow-ups after one, four and 12 months and again at 10 years, the ankle joint presented a full range of motion without pain or swelling. Post-operative radiographs at one month and at 10 years (Fig. 3) showed an absence of lesions, i.e., no recurrence. After 10 years, the radiographs indicate signs of mild degenerative changes. The patient was able to return to dancing.

Discussion

Synovial chondromatosis is a benign lesion that can grow and cause pain and swelling (6). Ankle joint location is not typical, but ankle bilateral location is also described (7).

Synovial chondromatosis is of unknown origin, characterized by metaplastic changes of the synovial

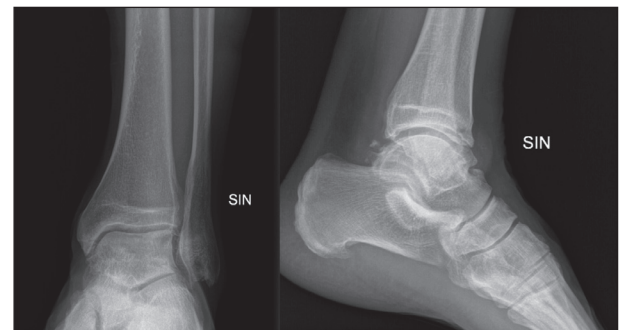


Figure 3. Post-operative X-ray at 10 years, shows absence of synovial chondromatosis recurrence with middle degenerative changes.

membrane, which develop a series of cartilaginous substance nodules that grow slowly, and are gradually released into the joint space as they detach from the synovial membrane.

Based on Milgram classification (8), synovial chondromatosis can be divided into three consecutive phases: the early phase is described as an active synovial disease without the presence of loose bodies, the intermediate phase with the presence of synovial disease and loose bodies, and the last phase is defined by the presence of loose bodies without synovial involvement.

Synovial chondromatosis patients present with symptoms that include joint pain exacerbated by activity, limited range of motion, joint effusion, and locking of the joint (9). At the beginning of the disease, differential diagnosis includes all causes of pain and swelling. The presence of loose bodies in the joint represents a continuous irritative process of the anatomical structures that severely compromise the balance of the joint with irreversible mechanical damage. Patients suffering from this symptomatology should be tested immediately to establish a correct diagnosis and a specific therapy (10). It is precisely for this reason that loose bodies must be removed as soon as possible, because they can lead to serious joint damage that requires further treatment (1,6).

Differential diagnostics must include testing for all forms of neoplasm that arise around joints and diseases that can cause articular loose bodies such as osteochondral post traumatic lesions, osteochondritis dissecans, rheumatoid arthritis, and tuberculosis arthritis. In the case of recurrences of the disease, malignant degeneration must always be suspected (11, 12).

X-ray imaging can be diagnostic and the presence of mineralized nodules are pathognomonic for synovial chondromatosis (13). Other important investigations are MRI and CT scan. In our case study, MRI revealed several loose bodies and proliferative synovium. The use of intravenous contrast is helpful in separating synovial fluid from synovial tissue with high vascularity. Once removed, the accurate diagnosis of the nature of the lesions must be confirmed through histopathological examination (12).

Treatment should be conservative and should aim to reduce pain, improve mechanical function, and prevent or restrict arthritis progression and chondral

damage (14). Traditionally, removal of large loose bodies and partial or subtotal synovectomy were achieved with open arthrotomy. Arthroscopy is a non-invasive procedure and associated with better recovery and less joint damage (14,15). Arthroscopy is very helpful in case of synovial chondromatosis in anterior and posterior compartments.

Conclusion

Synovial chondromatosis is a rare benign condition that can affect joint synovial tissue. In the presence of lesions that cause symptoms or grow in dimension, excision and synovectomy must be done. Ankle localization in anterior and posterior compartments can be treated by an arthroscopic approach that is linked to low morbidity and early rehabilitation.

Conflict of interest: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article

References

1. Padhan P, Ahmed S. Synovial Chondromatosis. *N Engl J Med.* 2019;381(14): 1364.
2. Neumann JA, Garrigues GE, Brigman BE, Eward WC. Synovial Chondromatosis. *JBJS Rev.* 2016 May 10;4(5). pii: 01874474-201605000-00005.
3. Sathe P, Agnihotri M, Vinchu C. Synovial chondromatosis of ankle in a child: A rare presentation. *J Postgrad Med.* 2020 Apr-Jun;66(2): 112-113.
4. Saxena A, St Louis M. Synovial Chondromatosis of the Ankle: Report of Two Cases With 23 and 126 Loose Bodies. *J Foot Ankle Surg.* 2017;56(1): 182-186.
5. Pellacci F, Zmerly H. I corpi liberi endoarticolari. *Rivista Italiana di Biologia e Medicina,* 2001;21(1): 345-347.
6. Peixoto D, Gomes M, Torres A, Miranda A. Arthroscopic treatment of synovial chondromatosis of the ankle. *Rev Bras Ortop.* 2018;53(5): 622-625.
7. Shearer H, Stern P, Brubacher A, Pringle T. A case report of bilateral synovial chondromatosis of the ankle. *Chiropr Osteopat.* 2007;15:18.
8. Milgram JW. Synovial osteochondromatosis: a histopathological study of thirty cases. *J Bone Joint Surg Am.* 1977 Sep;59(6): 792-801.
9. Santiago T, Mariano C. Primary synovial chondromatosis of the ankle joint presenting as monoarthritis. *BMJ Case Rep.* 2013;2013: bcr2013202186

10. Isbell JA, Morris AC, Araoye I, Naranje S, Shah AB. Recurrent Extra- and Intra-articular Synovial Chondromatosis of the Ankle with Tarsal Tunnel Syndrome: A Rare Case Report. *J Orthop Case Rep.* 2017;7(2): 62–65.
11. Yu N, Cheng F, Xiao L, Tong P, Wang C. Synovial sarcoma of the foot enlightening etiology: a case report. *Acta Biomed.* 2010 Dec;81(3):233–6.
12. Urwin JW, Cooper K, Sebro R. Malignant Transformation of Recurrent Synovial Chondromatosis: A Case Report and Review. *Cureus.* 2019 Oct 4;11(10):e5839.
13. Dheer S, Sullivan PE, Schick F, et al. Extra-articular synovial chondromatosis of the ankle: Unusual case with radiologic-pathologic correlation. *Radiol Case Rep.* 2020;15(5): 445–449.
14. Kunzler DR, Shazadeh Safavi P, Warren BJ, Janney CF, Panchbhavi V. Arthroscopic Treatment of Synovial Chondromatosis in the Ankle Joint. *Cureus.* 2017;9(12):e1983.
15. Ozmeric A, Aydogan NH, Kocadal O, Kara T, Pepe M, Gozel S. Arthroscopic treatment of synovial chondromatosis in the ankle joint. *Int J Surg Case Rep.* 2014;5(12): 1010–1013.

Received: 10 April 2020

Accepted: 10 May 2020

Correspondence:

Hassan Zmerly MD PhD

Head of Orthopaedic Surgery Department, Maria Cecilia Hospital, Presidio San Pier Damiano

Via Portisano 1, Faenza (RA) 40018 Italy.

Tel:+390546671111

Fax: +390546671514

E-mail: zmerly@libero.it