

Case Report

Ankle Synovial Chondromatosis: case report of 2 cases with 139 and 12 loose bodies treated arthroscopically

M. Shantharam Shetty¹, M. Ajith Kumar², Yogesh K.³, Karan Doshi⁴¹Chairman, Tejasvini Hospital & SSIOT, Mangalore, ²Head of Department, ³Consultant, ⁴Postgraduate resident, Department of Orthopaedics, Tejasvini Hospital & SSIOT, Mangalore

*Corresponding Author : Karan Doshi, Post Graduate Resident, Department of Orthopaedics, Tejasvini Hospital & SSIOT, Mangalore. E-mail : karaoshi@gmail.com.

Received : 25.02.2017

Review Completed : 11.08.2017

Accepted : 16.08.2017

Keywords : Ankle, Arthroscopy,
L o o s e b o d i e s ,
Osteochondromatosis, Synovial
chondromatosis

Access this article online

Quick Response Code



Abstract

Synovial chondromatosis is an uncommon, benign neoplastic nodular cartilaginous lesion of the synovium that can lead to loose bodies and arthritic degeneration if left untreated. We report the case of 2 patients with primary Synovial chondromatosis of the ankle with 139 and 12 loose bodies, respectively, who were treated arthroscopically. Both patients had successful outcomes without recurrence or malignancy, after excision of the lesions. We have reported the highest number of loose bodies (i.e. 139) in the ankle extracted arthroscopically. To conclude, Synovial chondromatosis, although benign, needs detailed investigations to rule out secondary causes and timely intervention to prevent further consequences. Arthroscopic treatment provides easy access and allows early return to activities.

Level of clinical evidence: 4- Case Report.

Introduction

Synovial chondromatosis is an uncommon, benign neoplastic nodular cartilaginous lesion of the synovium that can lead to loose bodies and arthritic degeneration if left untreated. First described by Leannac in 1813, Synovial chondromatosis is relatively rare, usually monoarticular consisting of proliferation of cartilaginous and multiple nodular cartilaginous bodies. This disorder has been found in the knee, hip, shoulder, elbow, foot, and ankle. The exact prevalence of ankle involvement with synovial chondromatosis is unknown.^[19] Only a few cases in the ankle have been reported in the literature. Larger joints are more commonly affected, with the knee being involved in up to 65% of reported cases. The number can vary from 1 to 2 loose bodies in the temporomandibular joint to >30 in the ankle.^[5,13] The disorder rarely converts to malignancy. The process that leads to the formation of loose bodies or "rice body" is unclear. It has been thought that changes in the

synovial membrane result in the formation of loose bodies in the joints. Ossification is not seen in approximately 45% of patients.^[1] This occurs in males twice as often as in females during the third to fifth decades.^[2] Trauma appears to be the precipitating factor and there has been no familial tendency reported.^[18] The formation of Synovial chondromatosis has commonly been considered a metaplasia that is a neoplastic process.^[15,4] Presenting complaints often include pain, swelling, sprains, paresthesias, and a palpable mass. Additionally, effusion, diffuse tenderness and crepitus can be found on clinical examination. Radiographs frequently show calcified, juxta-articular bodies, but are often nonspecific. Treatment for Synovial chondromatosis is removal of the loose bodies of the affected joint and synovectomy.

Nowadays, the arthroscopic approach is frequently preferred for ankle pathologies. The main advantages of

the arthroscopic approaches are decreased morbidity, synchronous visualization and treatment feature for intra and extra-articular pathologies.^[3]

We present 2 cases of synovial chondromatosis of the ankle treated with arthroscopic loose body removal and synovectomy with medium-term follow-up.

Case 1

A 29-year-old male presented with pain localized to the right ankle, aggravated by standing and walking. He had noted pain in his ankle for 2 years with difficulty in bearing weight. There was no history of trauma. His medical history was unremarkable and no family history of bone or joint diseases. On examination he had a visible swelling on the antero-lateral aspect of the ankle, crepitus was felt on movement at ankle and there was mild tenderness along the anterior joint line. Ankle range of motion was terminally painful. Radiographic imaging studies showed

multiple loose body calcifications (Fig 1). Since there was no history of prior, direct ankle trauma or systemic inflammatory disease, primary synovial chondromatosis was strongly suspected. The patient was scheduled for arthroscopic surgery and the diagnosis was confirmed. The patient had 139 loose bodies removed arthroscopically (Figs 2, 3). Arthroscopic ankle synovectomy was performed and joint lavage was performed with 3% hydrogen peroxide, well known for its cytotoxic effects.^[7] The gross pathological examination of the specimens was reported as multiple ovoid portions of white-tan osteocartilaginous tissue with the biggest and smallest dimensions of 0.9 cm × 0.8 cm × 0.6 cm and 0.2 cm × 0.1 cm × 0.1 cm in the permanent pathology report respectively (Fig 4). His ankle was otherwise stable. He was able to return to regular activities within 3 months without pain or limitations. He was on regular follow up for 1 year and there were no symptoms or signs of recurrence of loose bodies. .



Figure1 : Case 1 Preoperative AP & Lateral Xrays

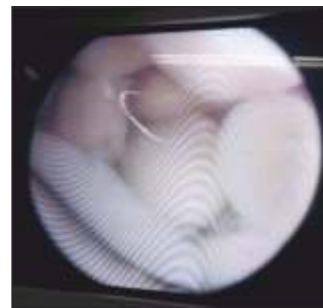


Figure 2 : Arthroscopic Loose body visualisation



Figure3: 139 lose bodies extracted from the ankle in Case 1



Figure 4 : Case 1 Loose bodies

Case 2

A 35-year-old male presented with primary complaints of occasional pain localized to the left ankle. He also complained of crepitation, and a catching sensation in the

ankle. The patient complained of pain since 3 years with no history of trauma. The patient was not a known smoker. His medical history was unremarkable and no family history of bone or joint diseases. On examination there was

tenderness on the anterior aspect of the ankle and crepitus on palpation with effusion. Ankle range of motion was symmetrical bilaterally. Multiple loose body calcifications in ankle joint with talo-navicular lipping were present on the plain anteroposterior and lateral X-ray images of the right ankle. (Fig 5) The patient was scheduled for arthroscopic surgery. The patient had 12 loose bodies removed arthroscopically. Arthroscopic ankle synovectomy was performed and joint lavage was performed with 3% hydrogen peroxide. The dimensions of the loose bodies ranged from 0.6 cm × 0.6 cm × 0.3 cm to 1.8 cm × 0.6 cm × 0.5 cm (Fig 6). There was no ankle instability. He returned to sports within 5 months. He was on regular follow up for 18 months and there was no recurrence of loose bodies.

Since there is a high rate of recurrence, these patients have to be periodically monitored for recurrence.



Figure 5 : Case 2 Preoperative AP and lateral Xrays



Figure 6 : Loose bodies extracted from Ankle in Case 2

Discussion

Synovial chondromatosis is essentially a benign process. A series in Northern Ireland demonstrated a 5% chance for malignant change. [1] The authors commented that although 5% represents a small risk of malignant change, this is a much higher risk than that quoted for malignant

change in other well recognized bone diseases.

The disease is classified as primary or secondary. [17] The primary one is characterized by undifferentiated stem cell proliferation of stratum synoviale. Trauma, degenerating joint diseases, osteochondritis dissecans, rheumatoid arthritis and tuberculosis arthritis are examples of the secondary form. Our cases were evaluated in the primary synovial osteochondromatosis group due to the absence of previous trauma or inflammatory pathologies.

Complaints of pain, swelling of the joint (especially after physical activity) with or without accompanying pain, decreased range of motion, palpable mass, locking paresthesias and joint clicking are main symptoms and signs in patients with synovial chondromatosis. The suspected diagnosis was confirmed by the appropriate radiologic investigations and pathologic examination after history taking and physical evaluation. The calcified form synovial osteochondromatosis could be seen in the anteroposterior and lateral plain Xray images.

The goal for the treatment of synovial chondromatosis is to remove the loose bodies, improve pain symptoms, regain movement in the joint, and limit the development of early osteoarthritis. The best treatment option is excision of the loose bodies with total synovectomy. Ankle arthroscopy can allow a faster return to activity. [14] Adjacent tendon sheaths could also have loose bodies; thus, preoperative examinations are critical. Tendoscopy could be of benefit and has been reported as a treatment for 3 cases. [10]

Milgram [12] described a classification of Synovial chondromatosis based on the location of the loose bodies within a joint and the pathologic findings of the synovium and loose bodies. He described phase 1 as intrasynovial involvement of cartilaginous loose bodies within the synovial membrane. Histopathologic examination showed intrasynovial proliferation of cartilage. Phase 2 was considered intrasynovial involvement with loose bodies, and phase 3 was multiple free bodies due to synovial osteochondromatosis. Both conditions have loose bodies found in a joint. In the first 2 phases, the loose bodies will

be cartilaginous with very little ossification. In phase 3, the loose bodies will have calcification. However, the classification does not explain the nidus that results in the proliferation of loose bodies.

Several studies have indicated a chromosomal component; others have reported a marked increase of fibroblasts in the presence of Synovial chondromatosis. Malignancy is seen typically seen in 5% of the cases.^[15,4] A review of the published data showed that with malignancy, multiple recurrences of Synovial chondromatosis develop.

Galat et al reported 8 patients with ankle synovial chondromatosis. In half the patients, synovectomy with excision of loose bodies resulted in pain free return to normal function, without recurrence. However, recurrence occurred in 3 of 8 patients with subsequent malignant transformation to low-grade chondrosarcoma in 2 patients.^[6]

Irrigation with hydrogen peroxide has been used by other authors for synovial tumors in the foot and ankle; this appears to decrease recurrence^[7,9]. Goni et al stated that hydrogen peroxide serves as a chemocautery (removing microscopic chemical elements), citing Kotwal et al's work from 2000^[9]. This may account for our favorable outcomes as we also used hydrogen peroxide for irrigation.

Saxena et al^[16] reported 2 cases with synovial chondromatosis of the ankle. They claimed that histopathologic analysis is required to rule out the presence of malignancy. They had long- and medium-term follow-up of the patients who underwent loose body removal and synovectomy. They were able to decrease their symptoms and increase their activity level. According to them, practitioners should have a high index of suspicion for Synovial chondromatosis when patients complain of joint stiffness and radiographs show multiple loose bodies

References

1. Davis R.I, Hamilton A, Biggart J.D Primary synovial chondromatosis: a clinicopathologic review and assessment of malignant potential. *Hum Pathol*.29 (7):683-8. 1998
2. Davis RI, Foster H,Arthur K Cell proliferation studies in primary synovial chondromatosis. *J. Pathol*. 184:18 –23. 1998
3. Doral MN, Uzumcugil A, Bozkurt M. Arthroscopic treatment of synovial chondromatosis of the ankle. *J Foot Ankle Surg* 46: 192–5.2007
4. Evans S, Boffano M, Chaudhry S et al. Synovial chondrosarcoma arising in synovial chondromatosis. *Sarcoma* 2014:1–4.2014
5. Fetsch JF, Vinh TN, Remotti F Tenosynovial (extra-articular) chondromatosis: an analysis of 37 cases of an under recognized clinicopathologic entity with a strong predilection for the hands and feet and a high local recurrence rate. *Am J Surg Pathol* 27(9):1260–1268. 2003

in and around a synovial joint.

Recurrent disease in the hip and knee has been reported in most series, regardless of the treatment. Maurice et al.^[11] suggested that recurrence after synovectomy may be due to remaining active synovium or persistence of the unknown stimulus which caused the metaplasia. DNA image cytometry suggests that chondrocytes in primary Synovial chondromatosis are fairly active and capable of proliferation.^[8] This finding may then obligate the surgeon to consider performing a complete synovectomy in the face of active synovium. Young-in Lee et al^[19] reported 5 cases of Synovial chondromatosis of the foot treated with arthrotomy and excision with no clinical or radiographic evidence of recurrence with an average of 5 years of follow-up.

Neither of our patients had any evidence of recurrence on follow-up.

Although the classical treatment approach for ankle joint chondromatosis is open surgery, arthroscopic surgery has been rarely encountered in the literature. Some important advantages of arthroscopic surgery are wide visualization areas, easy access to difficult to reach areas, lower morbidity, no need for casting and immobilization, early rehabilitation and quick recovery period. However, there is the possibility of limited synovectomy and residual loose bodies.

We have reported the highest number of loose bodies (i.e. 139) in ankle extracted arthroscopically.

To conclude, Synovial chondromatosis, although benign, needs detailed investigations to rule out secondary causes and timely intervention to prevent further consequences. Arthroscopic treatment provides easy access and allows early return to activities.

6. Galat DD, Ackerman DB, Spoon D et al Synovial chondromatosis of the foot and ankle. *Foot Ankle Int.* 2008 Mar;29(3):312-7. 2008
7. Goni V, Gopinathan N, Radora B, Vishwanathan V, Logithasan R, Balaji S Giant cell tumor of peroneus brevis sheath: a case report and review of the literature. *BMJ Case Reports* 2012 Jul 13 .2012
8. Knoeller SM .Synovial osteochondromatosis of the hip joint. Etiology, diagnostic investigation and therapy. *Acta Orthop. Belg.* 67:201 – 210.2001
9. Kotwal PP, Gupta V, Malhotra R Giant-cell tumor of the tendon sheath: is radiotherapy indicated to prevent recurrence after surgery? *J Bone Joint Surg Br* 82:571–573.2000
10. Liu TH .Tenosynovial osteochondromatosis of the flexor hallucis longus tendon treated by tendoscopy. *J Foot Ankle Surg* 54:758–764.2015
11. Maurice H, Crone M, Watt I. Synovial chondromatosis. *J. Bone Joint Surg.* 70B:807–811.1988
12. Milgram JW .Synovial osteochondromatosis: a histopathological study of thirtycases. *J Bone Joint Surg Am* 59:792–801.1977
13. Murphey MD, Vidal JA, Fanburg-Smith JC Imaging of synovial chondromatosis with radiologic-pathologic correlation. *RadioGraphics* 27:1465–1488. 2007
14. Ozemeric A, Aydogan N, Kocadal O, Kara T, Pepe M, Gozel S .Arthroscopic treatment of synovial chondromatosis in the ankle joint. *Int J Surg Case Rep* 12:1010–1013. 2014
15. Perry B, McQueen D, Lin J Synovial chondromatosis with malignant degeneration to chondrosarcoma: report of a case. *J Bone Joint Surg Am* 70:1259–1261.1988
16. Saxena A, St Louis M. Synovial Chondromatosis of the Ankle: Report of Two Cases with 23 and 126 Loose Bodies. *J Foot Ankle Surg.* 2016 Apr 5. Doi: 10.1053/j.jfas.2016.02.009
17. Shearer H., Stern P., Brubacher A .A case report of bilateral synovial chondromatosis of the ankle. *Chiropr Osteopat.* 2007;15:18.2007
18. Springer KR: Synovial chondromatosis. *J. Foot Surg.* 30(5):446–449.1991
19. Young-In Lee F, Hornicek FJ, Dick HM Synovial chondromatosis of the foot. *Clin. Orthop.* 423:186–190. 2004