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Case Report

IMAGING OF ANKLE SYNOVIAL CHONDROMATOSIS- A CASE REPORT

Ashish K. Gupta, *S Shrinuvasan, R Chidambaram and T Jothibasu
Department of Radiodiagnosis, Sri Lakshmi Narayana Institute of Medical Sciences (Affiliated to Bharath University) Osudu, Puducherry, India
**Author for Correspondence*

ABSTRACT
Synovial chondromatosis (SC) or joint chondroma is a rare benign cause of ankle swelling, There is a presence of multiple cartilaginous nodules or loose bodies in the synovium of the joints, tendon sheaths, ganglion, periarticular area and bursa. Most commonly it involves large joints, such as the knee, elbow, hip and shoulder. However, it is quite unusual and rare in the ankle joint .The diagnosis is made by taking a thorough history of the patient and performing a clinicoradiological examination. We present here the case report of a 64-year-old female with synovial chondromatosis of the right ankle joint and discuss the clinical and radiological findings.

Keywords: *Synovial Chondromatosis, Ankle Swelling, Radiological Findings*

INTRODUCTION
SC is a benign condition characterised by the formation of multiple intra-articular cartilaginous nodules present in the synovium of joints (Sedeek *et al.,* 2015). These nodules can become loose bodies post-detachment within the joint and may undergo secondary calcific and proliferative changes (Shearer *et al.,* 2007). Synovial cells undergo metaplastic transformation to chondrocytes, producing multiple cartilaginous nodules (Wong *et al.,* 1999). SC presents predominantly in men (M:F 2:1) in the age group of 30 to 50 years, mostly in large joints, (knee and hip) as small joints are less frequently involved (Blandino *et al.,* 1992). Patients usually present with an insidiously growing swelling associated with joint ache and limited of a range of movements. The patient also presents with a diffuse tenderness, joint effusion, and crepitus. Synovial chondromatosis presents in the ankle is an exceedingly rare condition (Galat *et al.,* 2008). We hereby present a case of synovial chondromatosis of the ankle joint and discuss the spectrum of classical imaging findings in various modalities such as radiography, USG, CT and MRI.

CASES
A 63-year-old female patient presented to the department with a 2-month history of pain in her right ankle. She also complained about joint stiffness, crepitation, and a catching sensation in the ankle; she also had a feeling of “walking on pebbles”. On examination, a mild tender swelling evident on the anterior and lateral aspect of the ankle joint. The patient's ranges of motion were decreased by 10% in dorsi- and 20% plantar flexion. No instability was detected with some anterior positive impingement was noted. There were no vascular or neurological abnormalities in the ankle and all laboratory studies were within the normal range.
Imaging features of SC are frequently pathognomonic. Anteroposterior and lateral radiographs of the right ankle were taken. Radiographic features illustrated multiple small, well-defined, juxta-articular ossific densities of varying size noted in the anterior and lateral aspect of the right ankle joint with periarticular soft tissue thickening. Joint space is maintained with no evidence of periarticular erosions noted (Figure 1a, b). On USG examination multiple curvilinear hyperechoic areas with dense after shadowing noted within joint space. Synovial thickening and minimal joint effusion also noted (Figure 2a, b). On CT examination Axial and reformatted coronal sections of CT show ossific densities adjacent to ankle joint (Figure 3a, b). Coronal T2W and T1W MRI sections of right ankle show synovial joint effusion with loose bodies appearing isointense to muscle on T1W and hyperintense to muscle on T2W sequences (Figure 4a, b) Sagittal sections of MRI ankle shows synovial joint effusion with herniation of synovium in

posterior aspect. One of the loose body in anterior aspect seen indenting superior aspect of talus with breach in cortex suggesting erosion (Figure 4c).

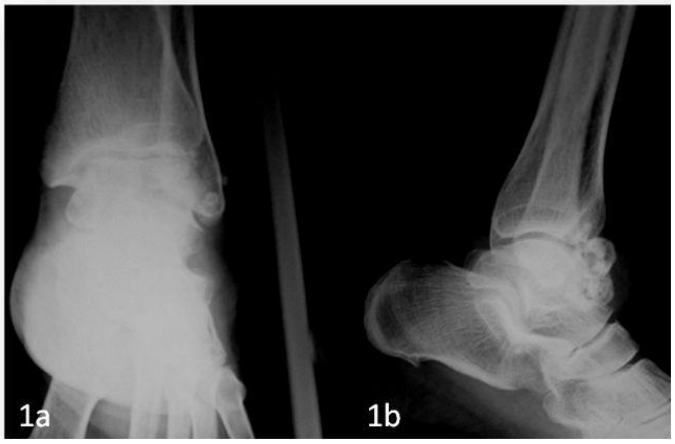

Figure 1: Multiple Small, Well-Defined, Juxta-Articular Ossific Densities of Varying Size in the Right Ankle Joint with Periarticular Soft Tissue Thickening Noted; Joint Space is Maintained with No Evidence of Periarticular Erosions and a Small Plantar Calcaneal Spur Noted (Figure 1a,b)

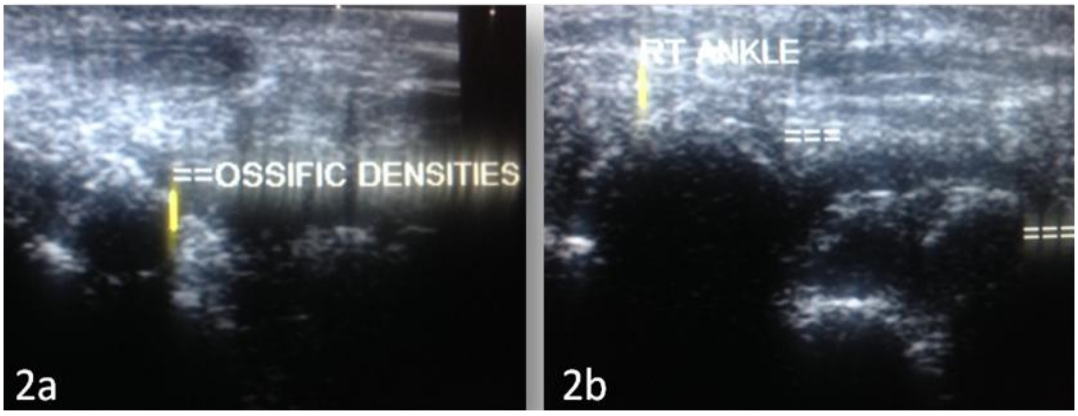

Figure 2: Multiple Curvilinear Hyperechoic Areas with Dense after-Shadowing within Joint Space; Synovial Thickening and Minimal Joint Effusion also Noted (Figure 2a, b)

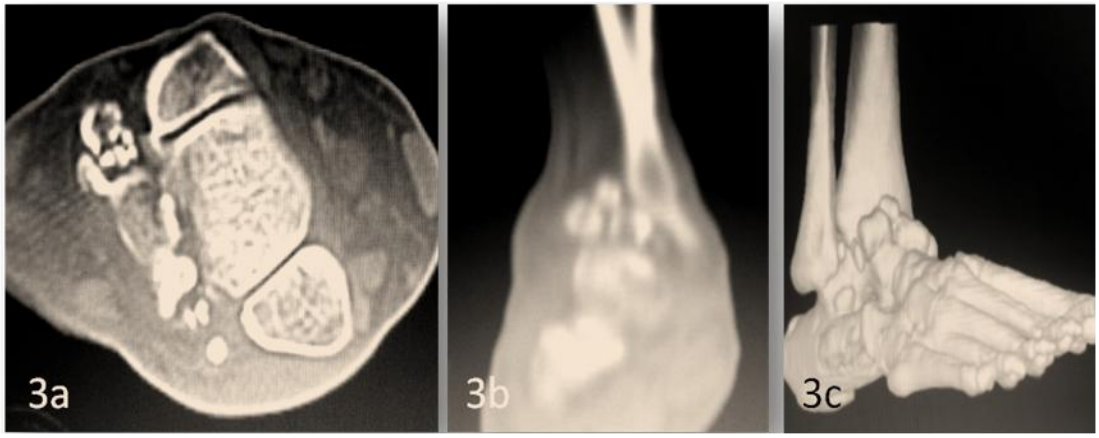

Figure 3: Axial and Reformatted Coronal Sections of CT Show Ossific Densities Adjacent to Ankle Joint (Figure 3a, b) which was also Confirmed on 3D Reconstruction Imaging (Figure 3c)

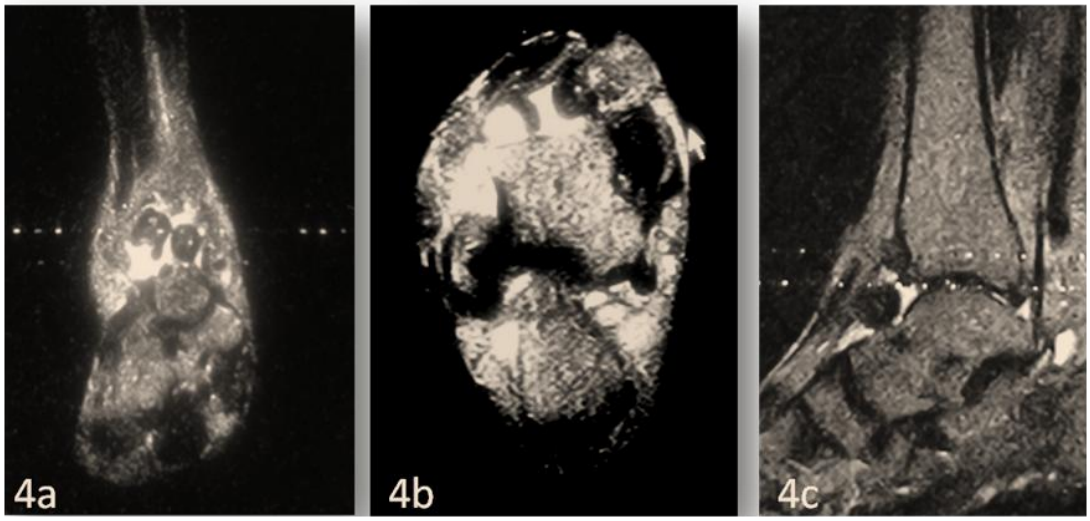

Figure 4: Coronal and Axial T2W MRI of Right Ankle Shows Joint Effusion with Loose Bodies Appearing Hyperintense to Muscle (Figure 4a, b) Sagittal MRI of Ankle Shows Joint Effusion with Herniation of Synovium in Posterior Aspect; One of the Loose Bodies is Seen Indenting Superior Aspect of Talus with Breach in Cortex Suggesting Erosion (Figure 4c)

The patient underwent ankle arthrotomy and surgical excision of the intra-articular bodies. Over 25 to 30 intra-articular loose bodies were extracted and revealed, all of which were ranged from 2.5 to 8 mm in size and homogenous in appearance. The diagnosis of primary synovial chondromatosis was affirmed by the histopathological examination (HPE) of the sample.

DISCUSSION

SC is a rare benign condition of synovial swelling characterised by multiple Intra- and extra-articular osteochondral loose bodies like pebbles (Wong *et al.,* 1999). Mostly large joints are affected frequently and the involvement is typically monoarticular .The knee joint is involved in 60 to 70% of cases and next are the elbow, shoulder and hip joints (Blandino *et al.,* 1992). Synovial chondromatosis of the ankle is a very rare condition. A review of the literature shows only a limited number of reported cases involving the foot and ankle (Galat *et al.,* 2008).

It is generally agreed that the exact aetiology of synovial chondromatosis is unknown to the source and controversy presents surrounding proposed hypotheses. Milgram *et al.,* (1977) classified the disease process into three distinct stages. In the first stage, the synovial lining changes into cartilaginous metaplasia. Active synovitis and nodule formation are present, but no calcifications can be identified. In the second stage, the nodules get to detached from the synovium joint and appear as loose bodies. The loose bodies are still cartilaginous primarily. In the third stage, activation of the synovium has subsided and multiple loose bodies can be observed within the joint cavity without any visible intrasynovial bodies. There is a tendency of loose bodies to unite and calcify (Milgram *et al.,* 1976).

Clinically, patients with synovial chondromatosis mostly present with joint pain, swelling, stiffness, and / or a movable mass, and some of them have a long clinical history before an accurate diagnosis is made (Hocking and Negrine, 2003). Recently there has been increasing interest in the diagnosis of these such cases due to a potential malignant degeneration (Milgram *et al.,* 1976). In Davis *et al.,* (1998) reported a 5 % relative risk for malignant degeneration in primary chondromatosis cases.

Imaging plays a crucially important role to reveal the diagnosis of synovial chondromatosis, with calcifications being present in the radiographic examination in 70 to 95% of cases. Multiple variable sized, smooth, round, calcified loose bodies, found within the joint cavity are significant diagnostic findings (Shearer *et al.,* 2007). Radiographic images usually only show an increase in soft tissue density around the affected joint (Wong *et al.,* 1999).

Thus, in cases where plain radiography cannot demonstrate ossification or calcification Ultrasonography, CT and Magnetic Resonance Imaging is particularly most useful (Blandino *et al.*, 1992).

In our study, radiographic images itself shows multiple loose bodies and confirmed by USG which shows synovial thickening and effusion as an additional findings. Whereas CT and MRI with multi-planner reconstruction help in planning the surgery.

The main goal for the treatment of synovial chondromatosis is to reveal and extract out the loose bodies from synovium, improve pain symptoms, regain movement in the joint, and limit to restrict the development of early osteoarthritis (Milgram *et al.*, 1976). The treatment of choice is either arthroscopic or open surgical excision. Synovectomy is mostly performed when there is active synovitis present, usually stage 1 or stage 2. Sometimes unknowingly, patients present in the late stage when active synovitis stage is not present; hence, a synovectomy is not needed (Davis *et al.*, 1998). Recurrence occurs in 5% to 25% of cases, due to active synovium remaining after synovectomy or sometimes metaplasia caused by the presence of the stimulus (Chen *et al.*, 2003).

In our case, the patient underwent ankle arthrotomy with surgical excision of the intra-articular bodies. Over 25 to 30 intra-articular loose bodies were extracted and revealed, all of which were ranged from 2.5 to 8 mm in size and homogenous in appearance. There was synovial thickening or proliferation present; hence, a synovectomy was performed. The diagnosis of primary synovial chondromatosis confirmed by the HPE of the sample. Postoperative radiographs show no loose bodies.

Conclusion

We report a case of synovial chondromatosis of the ankle because of its rarity. This unusual, benign synovial neoplasm presents readily recognisable clinical, radiographic, and pathological features. The pathologic appearance of SC may be misleading because of significant atypical histology, and therefore, radiologic correlation is vital and important to achieving a correct diagnosis. USG is important to identify synovial thickening and effusion.

CT is the best imaging modality to detect calcified bodies. Both CT and MR are good in image evaluation of bone erosions, but MR is the better modality to detect bone marrow invasion because of its superior musculoskeletal anatomical definition value, MR can also show soft tissue and extra-articular involvement. A multimodality imaging approach is better to fully identify this condition and to allow for optimal patient management.

REFERENCES

Blandino A *et al.*, (1992). Synovial osteochondromatosis of the ankle: MR findings. *Clinical Imaging* **16**(1) 34–36.

Chen CY *et al.*, (2003). Synovial chondromatosis of the hip: management with arthroscope-assisted synovectomy and removal of loose bodies: report of two cases. *Chang Gung Medical Journal* **26**(3) 208–214.

Davis RI *et al.*, (1998). Primary synovial chondromatosis: a clinic pathologic review and assessment of malignant potential. *Human Pathology* **29**(7) 683– 688.

Galat DD *et al.*, (2008). Synovial chondromatosis of the foot and ankle. *Foot and Ankle International* **29**(3) 312–317.

Hocking R and Negrine J (2003). Primary synovial chondromatosis of the subtalar joint affecting two brothers. *Foot and Ankle International* **24**(11) 865–867.

Milgram JW (1977). Synovial osteochondromatosis: a histopathological study of thirty cases. *The Journal of Bone & Joint Surgery Series A* **59**(6) 792–801.

Milgram JW *et al.*, (1976). Synovial osteochondromatosis of the knee. Chondromatous recurrence with possible chondrosarcomatous degeneration. *The Journal of Bone & Joint Surgery—American Volume* **58**(2) 264–266.

Sedeek SM *et al.*, (2015). Synovial Chondromatosis of the Ankle Joint: Clinical, Radiological, and Intraoperative Findings. *Hindawi Publishing Corporation Case Reports in Orthopedics* **2015** Article ID (359024), 3 pages http://dx.doi.org/10.1155/2015/359024.

Shearer H *et al.*, (2007). A case report of bilateral synovial chondromatosis of the ankle. *Chiropractic & Osteopathy* **15**(18). Published online 2007 Nov 24. doi: 10.1186/1746-1340-15-18.
Wong K *et al.*, (1999). Monoarticular synovial lesions: a radiologic pictorial essay with pathologic illustration. *Clinical Radiology* **54**(5) 273–284.