Scholars Journal of Medical Case Reports
Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Radiology

Teno-Synovial Chondromatosis: A Radiological Case Report with Review of the Literature

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DOI: 10.36347/sjmcr.2022.v10i07.020 | **Received:** 18.06.2022 | **Accepted:** 13.07.2022 | **Published:** 23.07.2022

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Abstract **Case Report**

Teno-synovial chondromatosis is an extra-articular cartilaginous or osteo-cartilaginous multinodular proliferation by metaplasia of synovial tissue. It can be primary (Reichel-Jones-Henderson syndrome) or secondary (trauma, arthritis, neuro-arthropathy...). We report the case of an extra-articular teno-synovial osteochondromatosis of the flexors of the 3rd finger by reviewing the different data in the literature.

Keywords: synovial tissue, Teno-synovial chondromatosis, osteo-cartilaginous.

INTRODUCTION

Teno-synovial chondromatosis is a synovial proliferation leading to the formation of multinodular cartilaginous mass on the medial aspect of the synovium, which may calcify. It occurs more frequently in young men with a sex ratio of 2:1 to 4:1 [7]. The extra-articular location predominates in the hand and foot.

Clinical symptoms evolve slowly and may be manifested by pain, swelling, functional limitation and sometimes joint effusions. Malignant degeneration to chondrosarcoma is rare but possible. Imaging plays an important role in the diagnostic orientation and contributes in the management.

We report a case of tenosynovial (extra-articular) osteochondromatosis of the flexors of the 3rd finger.

CASE REPORT

A 42-year-old man, a mechanic by profession, with no traumatic history, has presented for 3 years with a painful swelling of the 3rd finger that has increased in volume for 8 months. Clinical examination revealed a soft swelling on the palmar surface of the first phalanx with limited flexion and no inflammatory signs.

The patient underwent an MRI scan which showed a soft tissue formation centered on the flexor tendons (deep and superficial) of the third finger, well limited, with lobulated contours, in T1 low-signal, in T2 heterogeneous high-signal, with a few areas of nodular signal void and heterogeneously enhanced after injection of gadolinium, measuring 24.6 x 28 mm extended over 43 mm (Figure 1). The CT scan complement showed the presence of ring and arc calcifications clustered within the lesion, typical of chondroid calcifications (Figure 2). The patient underwent surgery with a good evolution.

Presence of a lesion centered on the flexor tendons of the 3rd finger, well limited with lobulated contours, in T1 low signal, in T2 heterogeneous high signal, with areas of signal void related to calcifications. This lesion showed a heterogeneous enhancement after gadolinium injection. It measures 24.6 x 28 mm extended over 43 mm.

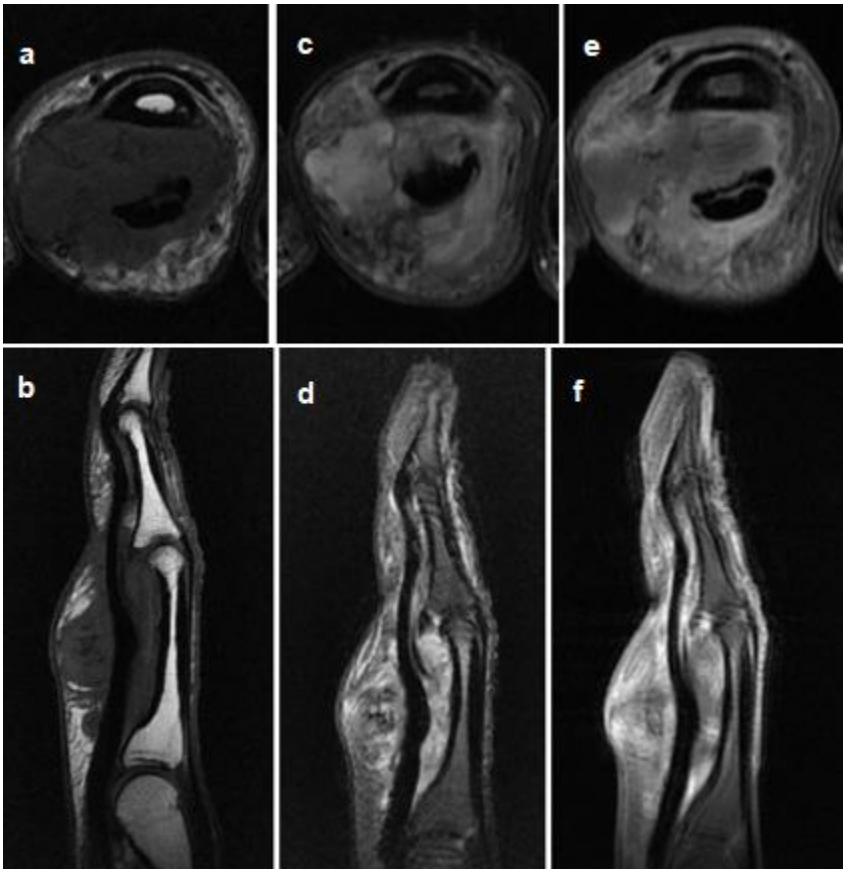

Figure 1: MRI of the hand in axial and sagittal T1-weighted images (a,b), T2-weighted images (c,d) and T1 Fat Sat weighted images after gadolinium injection (e,f)

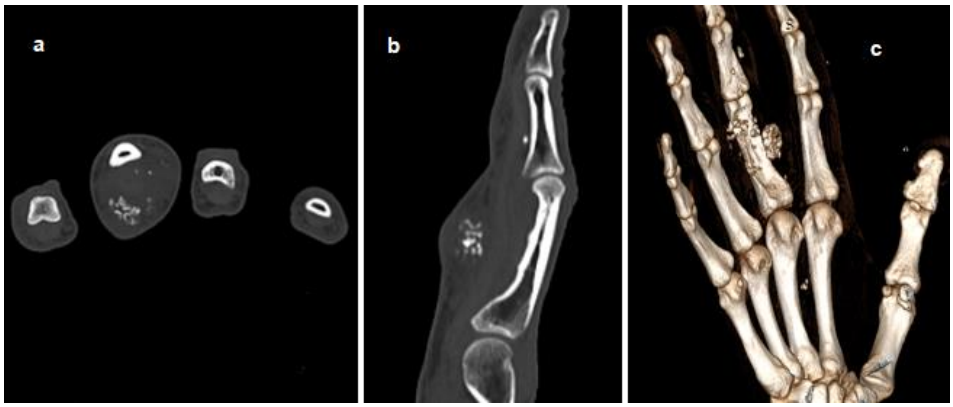

Figure 2: CT scan of the hand in axial (a), sagittal (b) and 3D reconstruction (c) sections

Tissular lesion is noted centered on the flexor tendons of the 3rd finger, showing typical ring and arc calcifications and scallopping on the 1st phalanx with thickening of the bony cortex.

DISCUSSION

Synovial chondromatosis/osteochondromatosis is a benign neoplastic pathology characterized by metaplasia of synovial tissue into a cartilaginous or osteo-cartilaginous matrix. This proliferation is frequently secondary to trauma or osteoarthritis and more rarely primitive. A distinction is made between intra-articular synovial chondromatosis (which predominates in the knee, elbow and hip), and tenosynovial chondromatosis, which is extra-articular and originates in the synovium of the tendon sheaths, and affects the hand and foot in nearly 79% of cases [1]. It predominates in middle-aged adults with a sex ratio of 2H/1F to 4H/1F [7].

The macroscopic appearance is that of a multi-lobulated formation of uniform size. Histologically, the lesions comprise multiple hypercellular cartilaginous nodules with cellular and architectural atypia. The multinodular appearance helps to differentiate synovial chondromatosis from chondroma [1], which may exceptionally be extraosseous and constitute a differential diagnosis.

These nodules develop on the inner surface of the synovium and then detach to form loose bodies [4]. Milgram's 1977 classification describes three progressive phases of synovial chondromatosis [3]:

- Initial phase: active synovitis, without loose bodies.
- Transitional phase: active synovitis, with detachment of loose bodies.
- Late phase: multiple loose bodies, without active synovitis.

The results of Koichi Saotome *et al*., study in 1999 showed a potential for slow growth of loose bodies either by direct proliferation of chondrocytes in primary forms or by cartilage metaplasia followed by proliferation of adjacent soft tissue in secondary forms [4].

Clinically, the most frequent manifestation is a painful limitation with slowly evolving swelling.

Imaging findings depend on the stage of evolution. Plain X-ray radiograph may be normal or reveal an intra- or juxta-articular tissue lesion formed by multiple uniformly sized nodules with annuring and arc chondroid-like calcifications [6, 7]. CT and arthroscan are useful for detecting bone erosion and searching for loose bodies in intra-articular forms. The MRI appearance is variable but most often shows a low-signal or intermediate signal in T1, a high-signal in T2 with areas of signal void better visible on the gradient echo sequence, related to calcifications [6, 7]. Primary synovial chondromatosis can be distinguished from the secondary form on imaging; in fact, in the latter case, nodules of few number and variable size are found with signs of underlying joint involvement [6].

Treatment of the primary form consists of synovectomy with removal of the loose bodies, whereas for the secondary form, it is essentially based on the cure of the etiology in question associated with the removal of the loose bodies. Recurrence after surgical treatment is frequent (up to 30% of cases) [1, 6].

Rare cases of malignant degeneration into chondrosarcoma have been described in the literature. Predictors of malignancy are bone erosion and infiltration or the occurrence of distant metastases [6, 8].

CONCLUSION

Tenosynovial (extra-articular) osteochondromatosis is a rare benign pathology of an often favorable prognosis with a potential for recurrence and malignant degeneration. Imaging findings are pathognomonic and contribute to positive diagnosis. MRI remains the elective test.

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