

## Extra-Articular Tenosynovial Chondromatosis of the Calcaneal Tendon in a 43-Year Old Man: A Case Report and Literature Review

Amine B\*, Mohamed D, Victor A, Sokmean U, Guissaga K and Tim R

Department of Orthopaedic and Trauma Surgery, Hospital Center, Douai, France

### \*Corresponding author:

Bader Amine,  
Department of Orthopaedic and Trauma Surgery,  
Hospital Center, Douai, 59507, France,  
E-mail: 90aminebader@gmail.com

Received: 07 Jan 2023  
Accepted: 27 Feb 2023  
Published: 06 Mar 2023  
J Short Name: COS

### Copyright:

©2023 Amine B, This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and build upon your work non-commercially.

### Citation:

Amine B. Extra-Articular Tenosynovial Chondromatosis of the Calcaneal Tendon in a 43-Year Old Man: A Case Report and Literature Review. Clin Surg. 2023; 9(2): 1-3

### Keywords:

Tenosynovial chondromatosis; Ankle; Flap; Tendon

### 1. Abstract

Tenosynovial chondromatosis is a rare benign disorder, characterized by formation of cartilaginous bodies within the synovia of the tendon sheaths.

**1.1. Case Presentation:** A 43-year old man, presented at the hospital-center, with a complaint of a mass next to the right calcaneal tendon. A surgical excision was performed, and histological examination suggests an Osteochondroma. Twelve years later, the patient consulted again for recurrence of the mass. X-ray showed calcified bodies at the distal part of calcaneal tendon. The patient had a resection of a mass of 3\*2\*1 cm. A large gap within the tendon was covered by a Turndown Flap with a good outcome at 6 months of follow up.

### 2. Introduction

Tenosynovial Chondromatosis (TC) is a rare benign disorder characterized by formation of cartilaginous bodies within the synovia of the tendon sheaths [1].

It is thought to arise from a metaplastic process on the synovial membrane. Malignant transformation to chondrosarcoma is uncommon but has been described [2].

In this case, we report the clinical, radiologic, and histology of a 43-year-old man who presented with a one-year history of mass on the right ankle with limitation of motion.

### 3. Case Report

A 43-year old man, without any past medical history, presented

at the hospital-center, with a complaint of a painless but irregular mass next to the right calcaneal tendon. He had noticed it since one year, and recalled no history of trauma or infection.

A surgical excision of the mass was performed, and histological examination suggests an Osteochondroma without any malignancy criterion.

Twelve years later, the patient consulted again for recurrence of the mass. He suffered from pain despite rehabilitation sessions.

#### 3.1. On Physical Examination

a 3 cm, slightly painful hard mass was palpable over the calcaneal tendon; the range of motion of the ankle was slightly reduced.

The plain radiographs of the ankle showed multiple-calcified bodies of varying size at the distal part of calcaneal tendon (Figure1).

In prone position, under general anesthesia, with a pneumatic tourniquet at the root of the limb, the patient had a resection of a mass of 3\*2\*1 cm (Figure 2).

We thus notice a large gap within the tendon (Figure 3). The solution chosen to avoid the weakness of the tendon was to perform a Turndown Flap: A distally based 1 by 5-cm flap was fashioned in the proximal part of the tendon and turned down to cover the defect. The defect produced by the flap was also closed (Figure 4).

Cast immobilization in plantar flexion of the ankle was established for 3 weeks, then at 90° for another 3 weeks. Rehabilitation sessions were then started, with a good result at 6 months of follow up.



**Figure 1:** X-ray of the right ankle in profile



**Figure 2:** synovial Osteochondroma in the sheath of the calcaneal tendon



**Figure 3:** Aspect of the tendon after Tumor's resection



**Figure 4:** Turn down flap of the calcaneal Tendon

#### 4. Discussion

Extraskeletal osteochondromas, compared to their counterparts occurring in the bone, are uncommon. These include the soft tissue chondromas, tenosynovial and synovial osteochondromatosis [2]. Synovial chondromatosis may be classified based on the involvement of joint, tendon sheath, or bursa. TC is the extra-articular form of synovial chondromatosis [1]. It involves the tendon sheath, especially in the hands or feet [3]. It is histologically similar to synovial chondromatosis, but less common and has a higher recurrence rate, reported up to 88% in contrast to 60% of the intra-articular form of this disease [3-5].

TC affects the flexor tendons sheaths more frequently than the extensor[5]. To the best of our knowledge, no significant determinant factors such as trauma, infection, repetitive stress or over usage have been reported to be associated with this entity [4,6]. Most literature agrees that TC predominates around the fifth decade of life [4].

The clinical diagnosis of TC is difficult due to its intermittent nature, slow disease progression and atypical clinical manifestations. Many patients are asymptomatic. However, if symptoms are present, the two most common symptoms are painless swelling over the span of several months to years and mild point tenderness over the lesion [3].

The plain radiographs of extra-articular TC are usually nonspecific, including the existence of calcifications, soft tissue mass, or ossification in the cartilaginous nodules [4,6].

Other authors have reported diagnostic imaging studies using ultrasound, Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) to further evaluate tenosynovial chondromatosis.

CT-scan of TC can clearly detect non-calcified loose bodies that are not visible on plain radiographs as well as cortical erosions. MRI is useful to reveal the exact locations of the nodules, and signal intensities differ according to the degree to which the nodules have mineralized. In the reported cases, the nodules show a low to intermediate signal intensity as compared to muscle on T1-weighted images, with high signal intensity on T2-weighted images. Ultrasound is also a modality that is particularly sensitive to identify

nodules affecting the tendon sheath [3,4].

The treatment of choice for TC is surgical resection. Some authors have highlighted a nonsurgical approach with surveillance of the progression depending mainly on the patient's preference when the signs and symptoms of swelling, reduced range of motion, and pain are tolerable [1]. The final aim of surgery is complete excision of the loose bodies together with curettage of the excavation [7]. It has been reported that predominant symptoms such as pain and mechanical deficiencies are relieved by the evacuation of the lesion [7]. Meanwhile, further surgical treatment with dissection of the surrounding synovial membrane has remained controversial. Some authors support the resection of loose bodies with synovectomy, while others recommend the resection of loose bodies alone [8].

The reported local recurrence of TC after resection is high and ranges from 24% and as high as 88% according to a cohort study of 37 cases [4,6]. The recurrence of TC can take several months to several years. To the best of our knowledge, no case reports of patients with malignant cases of TC have been reported.

The loss of tendon substance following the resection of the tumor is the equivalent of a chronic rupture, and its management is challenging. Several surgical techniques have been described, such as V-Y Tendon Alignment, Turndown Flaps, Peroneus Brevis, Flexor Digitorum Longus, Flexor Hallucis Longus graft.

The Turndown Flap that we used in our case was described by Christensen. He used it for both chronic and acute tendon ruptures. A distally based 2 by 10-cm flap was fashioned in the proximal part of the tendon and turned down to cover the defect. The defect produced by the flap was also closed. Twenty-nine of thirty-nine patients in that series were reported as having a satisfactory outcome [9].

Arner and al used two flaps, one medial and the other lateral, and rotated both, in opposite directions [10].

V-Y and turndown flaps have been combined, with good results. In a series of six patients who underwent postoperative isokinetic strength testing, deficiencies in peak torque plantar flexion were found to range from 2.5% to 22% compared with values for the unaffected limb [11].

## 5. Conclusion

Tenosynovial chondromatosis is a rare extra-articular counterpart of synovial chondromatosis. It's mostly asymptomatic, and has a high recurrence rate, reported up to 88%.

CT or MRI can depict characteristic features of the lesion with involvement of tendon sheath, particularly in the hands or feet, and suggest the diagnosis of tenosynovial chondromatosis.

Its treatment consists of a block resection with filling of the loss of substance by a flap or a tendon graft.

## References

1. Qi-Huang S, Jacho FAL, David L, Weingarten E. Extra-articular tenosynovial chondromatosis of the right fifth digit in a 59-year-old man: A case report and literature review. *J Radiol Case Rep.* 2021; 15(8): 8-17.
2. Veras E, Abadeer R, Khurana H, Tan D, Ayala A. Solitary synovial osteochondroma. *Ann Diagn Pathol.* 2010; 14(2): 94-9.
3. Chen YX, Lu YX, Zhuang ZE, Li ZY. Extra-articular tenosynovial chondromatosis of the left ring finger in a 23-year-old man: A case report and literature review. *Exp Ther Med.* 2015; 10(4): 1581-3.
4. Walker EA, Murphey MD, Fetsch JF. Imaging characteristics of tenosynovial and bursal chondromatosis. *Skeletal Radiol.* 2011; 40(3): 317-25.
5. Maccagnano G, Notarnicola A, Solarino G, Pesce V, Moretti B. Extra-articular chondromatosis of flexor and extensor compartments of the hand: Case report and review of literature. *SAGE Open Med Case Rep.* 2017; 5: 2050313X17724323.
6. Fetsch JF, Vinh TN, Remotti F, Walker EA, Murphey MD, Sweet DE. Tenosynovial (extraarticular) chondromatosis: an analysis of 37 cases of an underrecognized clinicopathologic entity with a strong predilection for the hands and feet and a high local recurrence rate. *Am J Surg Pathol.* 2003; 27(9): 1260-8.
7. Wong SH, Salama S, Thoma A. Synovial chondromatosis of the hand: Three case reports and literature review. *Can J Plast Surg.* 2003; 11(1): 47-52.
8. Jeffreys TE. Synovial chondromatosis. *J Bone Joint Surg Br.* 1967; 49(3): 530-4.
9. Christensen I. Rupture of the Achilles tendon; analysis of 57 cases. *Acta Chir Scand.* 1953; 106(1): 50-60.
10. Arner O, Lindholm A, Orell SR. Histologic changes in subcutaneous rupture of the Achilles tendon; a study of 74 cases. *Acta Chir Scand.* 1959; 116(5-6): 484-90.
11. Us AK, Bilgin SS, Aydin T, Mergen E. Repair of neglected Achilles tendon ruptures: procedures and functional results. *Arch Orthop Trauma Surg.* 1997; 116(6-7): 408-11.