Case 18540

Eurorad

Tenosynovial giant cell tumour localised type (L-TSGCT) of the ankle

Published on 24.04.2024

DOI: 10.35100/eurorad/case.18540
ISSN: 1563-4086
Section: Musculoskeletal system
Area of Interest: Musculoskeletal soft tissue
Imaging Technique: MR
Imaging Technique: Ultrasound
Case Type: Clinical Case
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Patient: 38 years, female

Clinical History:

A 38-year-old woman with a 2-year history of a slowly-growing mass on the anterolateral aspect of the left ankle. During that time the patient has reported minimal pain while walking or standing for prolonged periods, and the joint sometimes becomes inflamed when she overexerts.

Imaging Findings:

MRI was performed, demonstrating an oval and well-defined nodular lesion in the antero-lateral region of the ankle, in close relationship with the tendon sheath of the extensor digitorum longus. The image presents hypointense signal in T1 (Figures 1a, 1b and 1c) and intermediate signal in T2 sequences (Figure 2), with subtle areas of signal drop in sequences of magnetic susceptibility (Figure 3) and enhancement after administration of IV contrast (Figure 4).

The ultrasound evaluation showed a solid lesion, homogeneously hypoechoic (Figures 5a and 5b) with slight peripheral flow in the power Doppler study (Figure 6).

A US-guided biopsy was performed (Figure 7), and histopathological results were obtained (Figure 8).

Discussion:

Background

Tenosynovial giant cell tumour (TSGCT) is the unifying term used in the 2020 WHO Soft Tissue and Bone Tumours Classification [1]. They have previously been known as pigmented villonodular tumours of the tendon sheath (PVNTS). It is a benign proliferative disease affecting synovial membranes, arising from the synovium of joint, bursae and/or tendon sheath. There are 2 forms, localised (L-TSGCT) and diffuse (D-TSGCT), which, although histologically similar, behave differently [3]. Localised tenosynovial GCT is more common, with a predominance for the hand and wrist, whereas the diffuse type is less common and affects the large joints (e.g., knee, hip, ankle) more [2]. It may be intra or extra-articular, and is classified as localised or diffuse, with diffuse forms being more aggressive. Extra-articular tenosynovial GCTs are most commonly periarticular in the lower limb (particularly the knee) but can be intramuscular or subcutaneous in location [1].

Clinical Perspective

TSGCT is a rare pathology affecting young subjects [4], mostly in the 4th and 5th decades of life [1]. The most frequent presentation is the localised form with a predilection for women. Localised forms predominate in the digits (85%), near the synovial sheaths or interphalangeal joints, more often on the palmar than the dorsal side and usually present as a single nodular lesion. Other less frequent locations comprise the wrist, foot and ankle, knee and, very rarely, hip or elbow [1,5]. Clinical presentation is relatively nonspecific [4].

Imaging Perspective

The gold standard for the diagnosis is MRI. Localised forms typically show a well-delineated lesion, in contact with the tendon sheath. Diffuse forms are usually articular.

The tendency of the lesions to bleed results in deposition of hemosiderin, more commonly in diffuse forms of the disease. The paramagnetic effect of hemosiderin results in the reduction of signal intensity in all pulse sequences, which is enhanced by highfield-strength and gradient-echo sequences. The reduction of signal intensity is more accentuated on T2-weighted images [6]. The signal is enhanced on gadolinium injection. Bone erosion and neurovascular encasement can be seen.

In ultrasound evaluation, most tumours are hypoechoic, homogeneous, posterior acoustic enhancement may be seen in some lesions, and typically show vascularity on power Doppler [7].

Outcome

The treatment of choice is surgery, and as TSGCT is most often present in the benign form, extensive surgery is generally not indicated. Localised forms usually permit total macroscopic resection and show little recurrence [8].

Teaching Points

TSGCT of the ankle is an uncommon localisation of the disease. Although the most frequent location is in the fingers, one should suspect it in other locations when the lesion is in close contact with synovial membranes. This is especially true when MRI shows a lesion with signal drop in magnetic susceptibility sequences.

All patient data have been completely anonymised throughout the entire manuscript and related files.

Differential Diagnosis List: Tendon sheath fibroma, Tenosynovial giant cell tumour localised type (L-TSGCT), Desmoid tumour, Tophaceous gout, Nodular fasciitis

Final Diagnosis: Tenosynovial giant cell tumour localised type (L-TSGCT)

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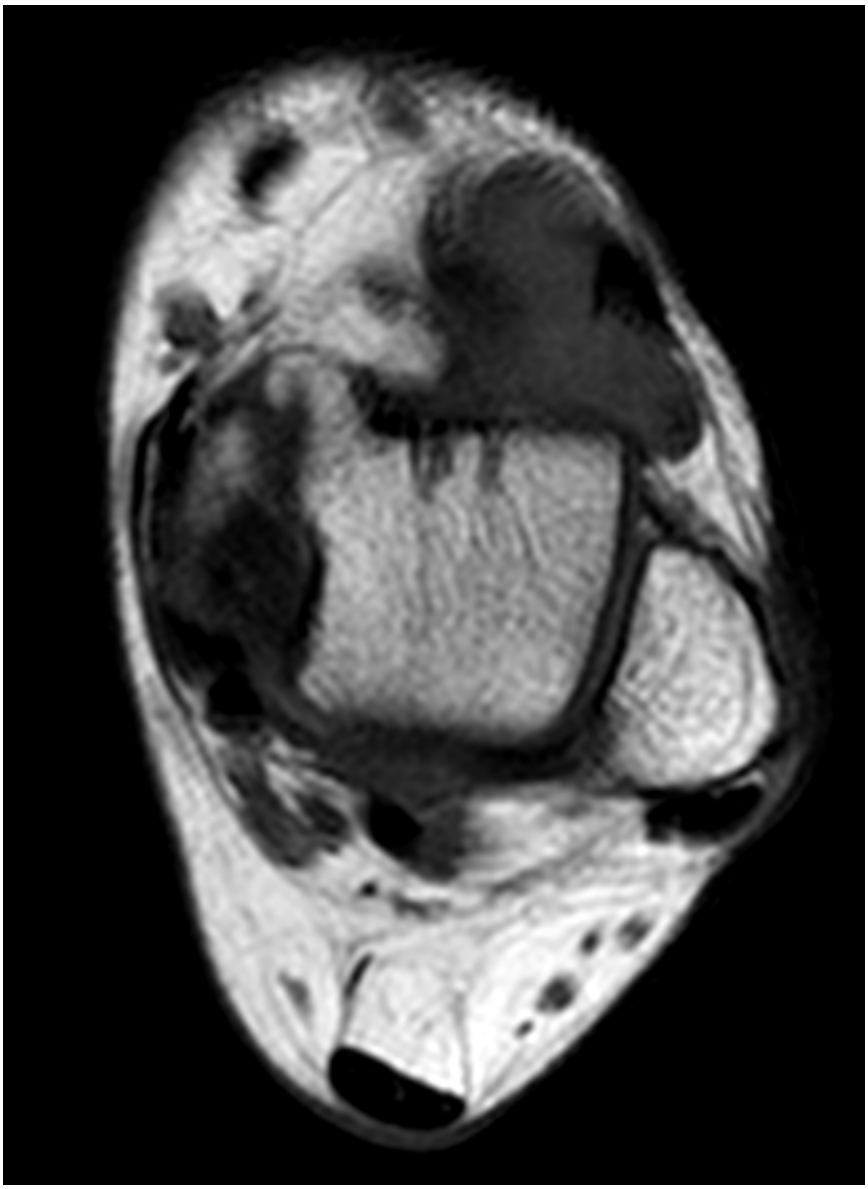
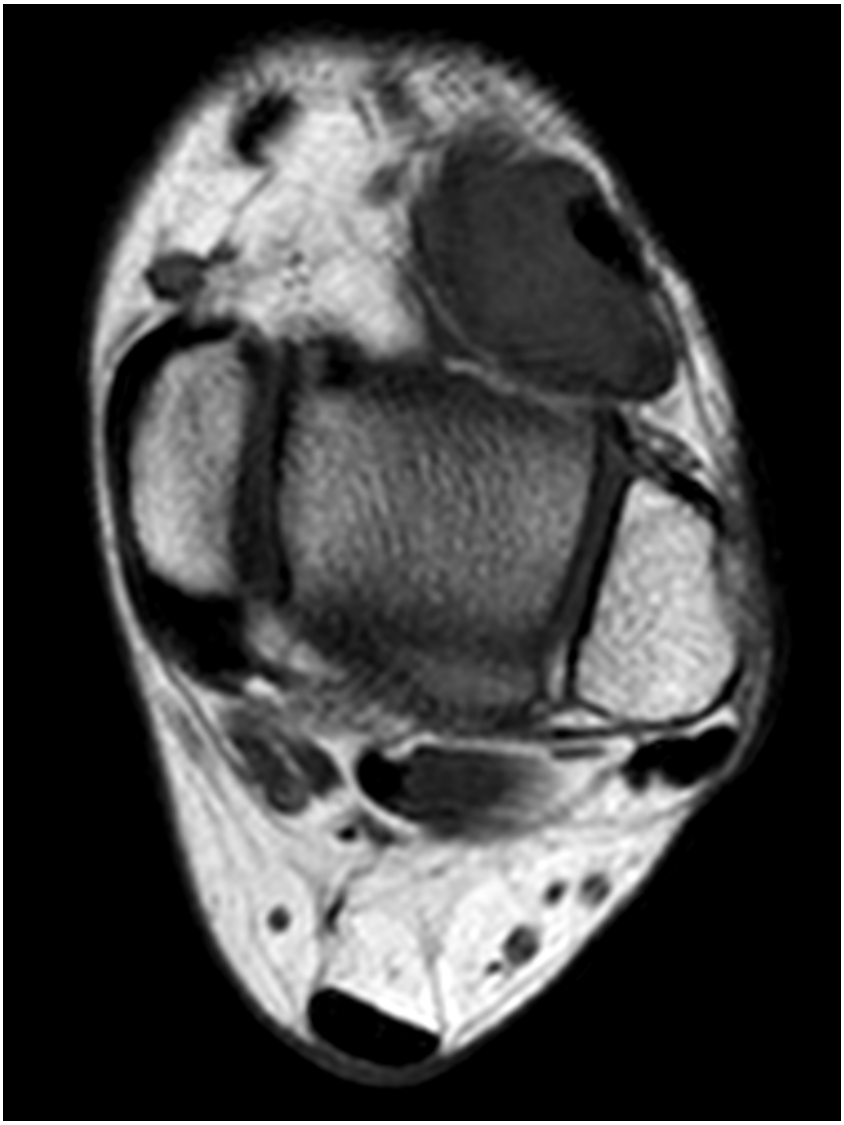
Figure 1

a



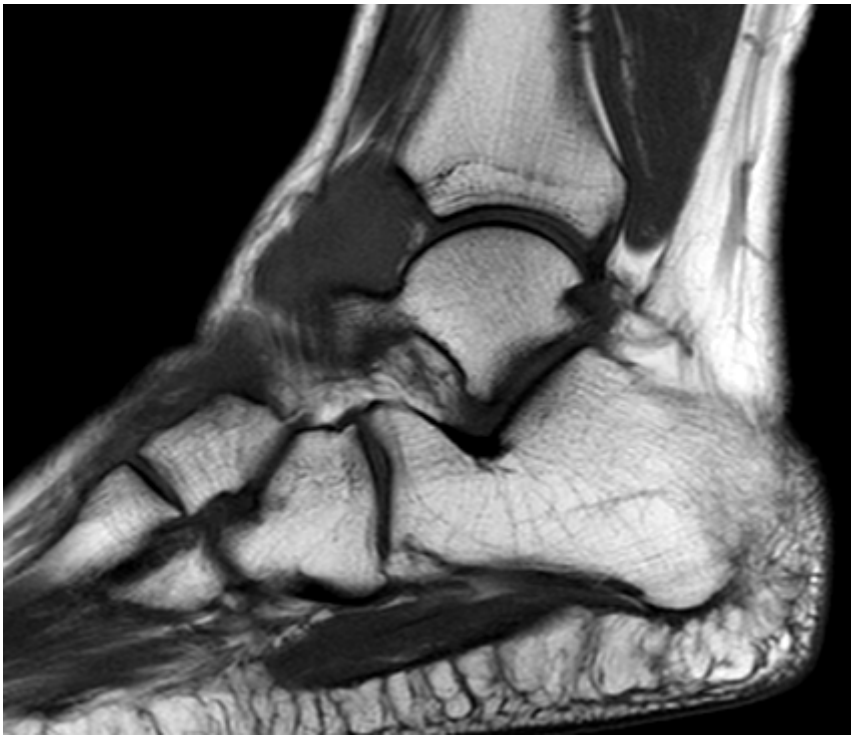
Description: Axial (1a and 1b) and sagittal (1c) T1-weighted images depict hypointense, lobulated contoured mass in close relationship with the tendon sheath of the extensor digitorum longus (1a and 1b). **Origin:** © Department of Musculoskeletal Radiology, Hospital Universitari de Bellvitge (HUB), Barcelona, Spain, 2024

b



Description: Axial (1a and 1b) and sagittal (1c) T1-weighted images depict hypointense, lobulated contoured mass in close relationship with the tendon sheath of the extensor digitorum longus (1a and 1b). **Origin:** © Department of Musculoskeletal Radiology, Hospital Universitari de Bellvitge (HUB), Barcelona, Spain, 2024

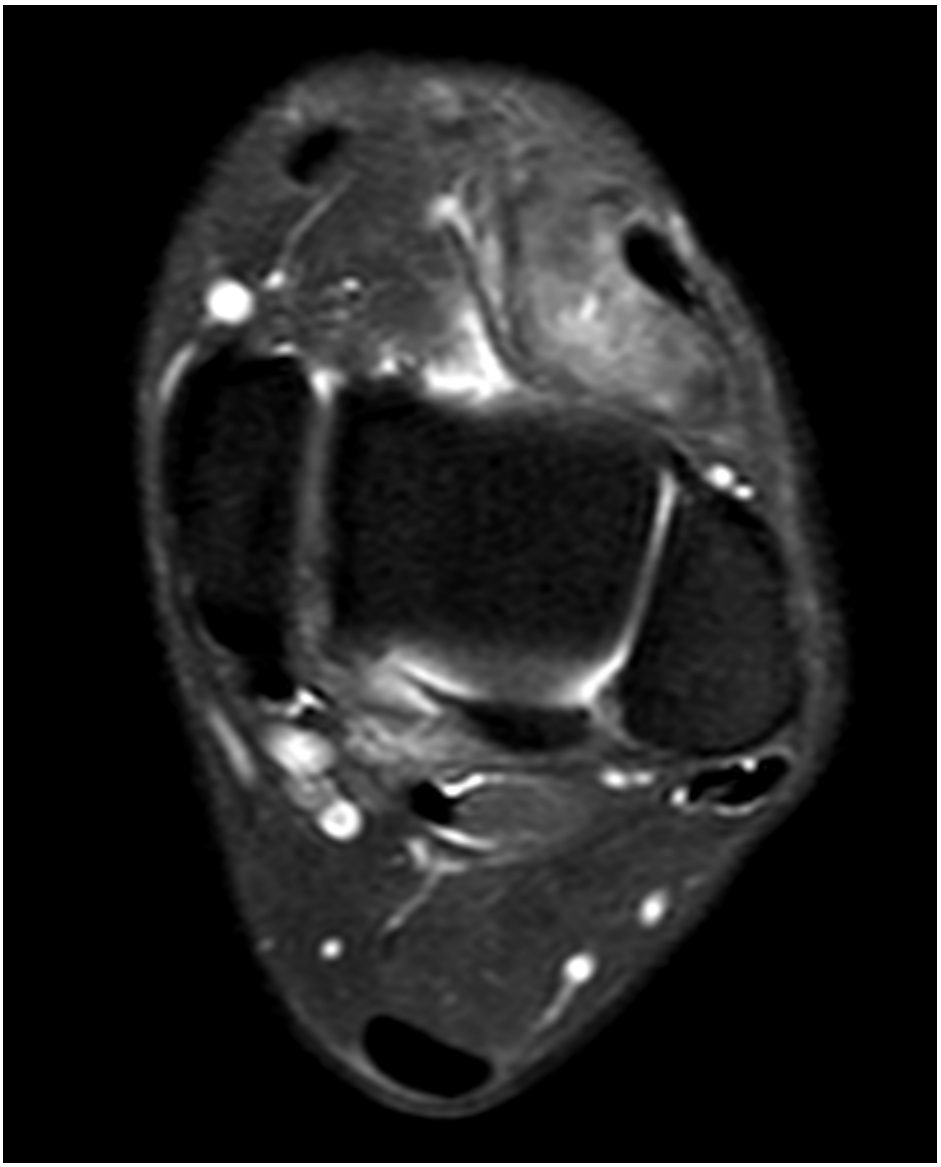
c



Description: Axial (1a and 1b) and sagittal (1c) T1-weighted images depict hypointense, lobulated contoured mass in close relationship with the tendon sheath of the extensor digitorum longus (1a and 1b). **Origin:** © Department of Musculoskeletal Radiology, Hospital Universitari de Bellvitge (HUB), Barcelona, Spain, 2024

Figure 2

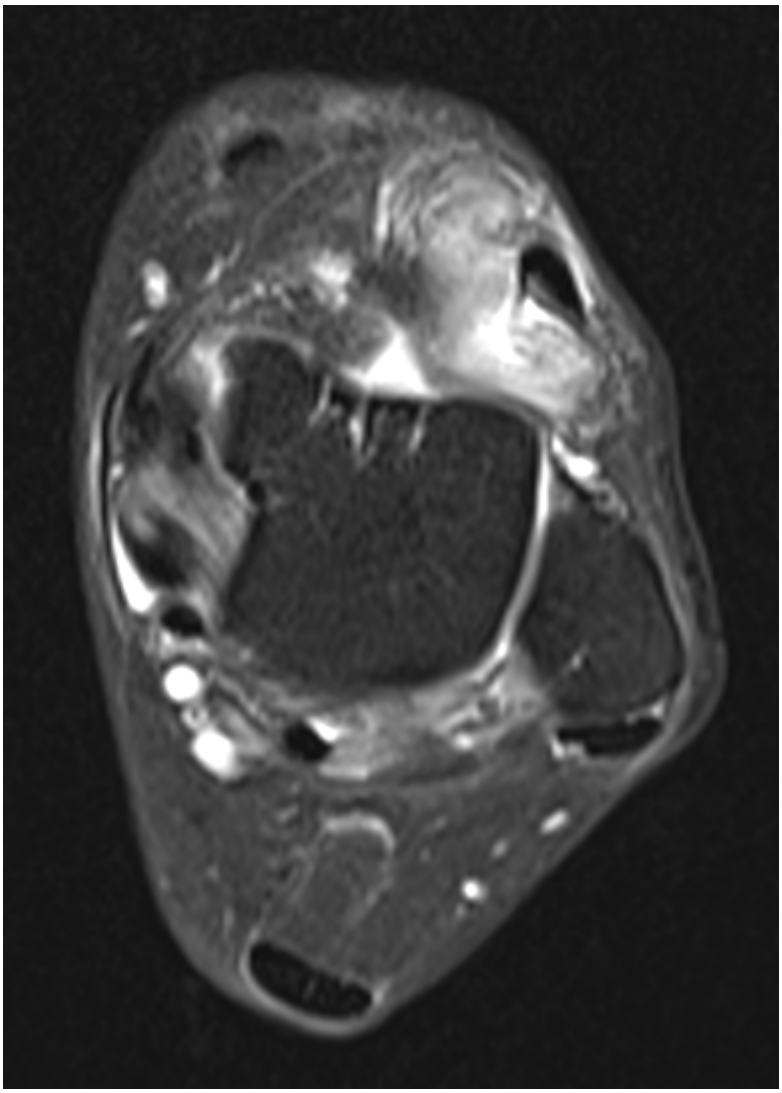
a



Description: Axial DP fat-sat shows heterogeneous intermediate-hyperintense, lobulated contoured mass in close relationship with the tendon sheath of the extensor digitorum longus. **Origin:**

Figure 3

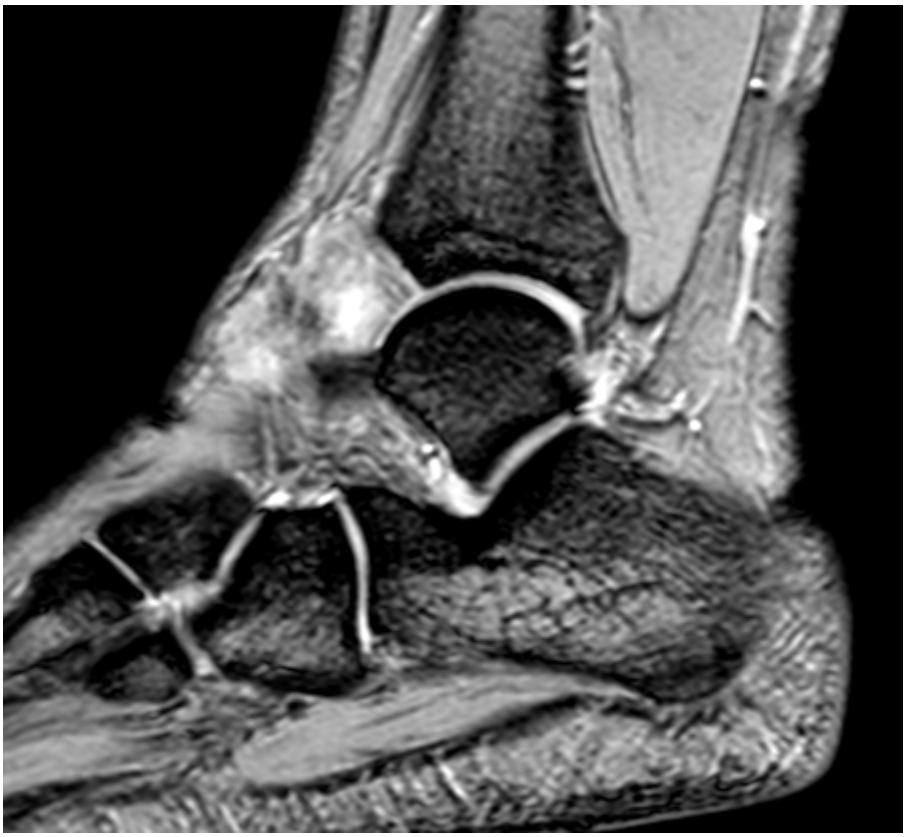
a



Description: Subtracted postcontrast T1W image shows prominent enhancement of the mass. **Origin:** © Department of Musculoskeletal Radiology, Hospital Universitari de Bellvitge (HUB), Barcelona, Spain, 2024

Figure 4

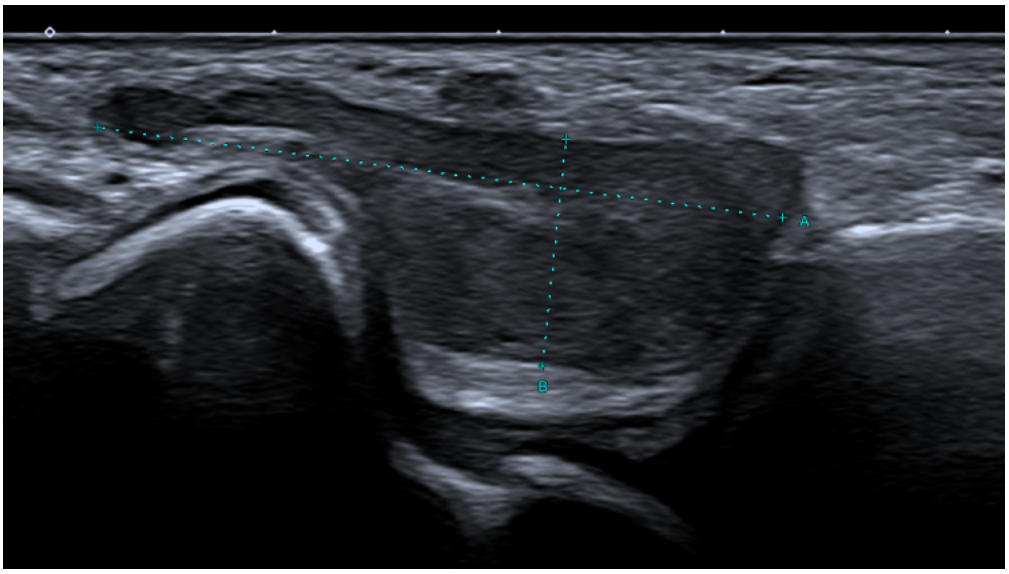
a



Description: Sag FFE. Blooming artefacts secondary to hemosiderin pigments. **Origin:**

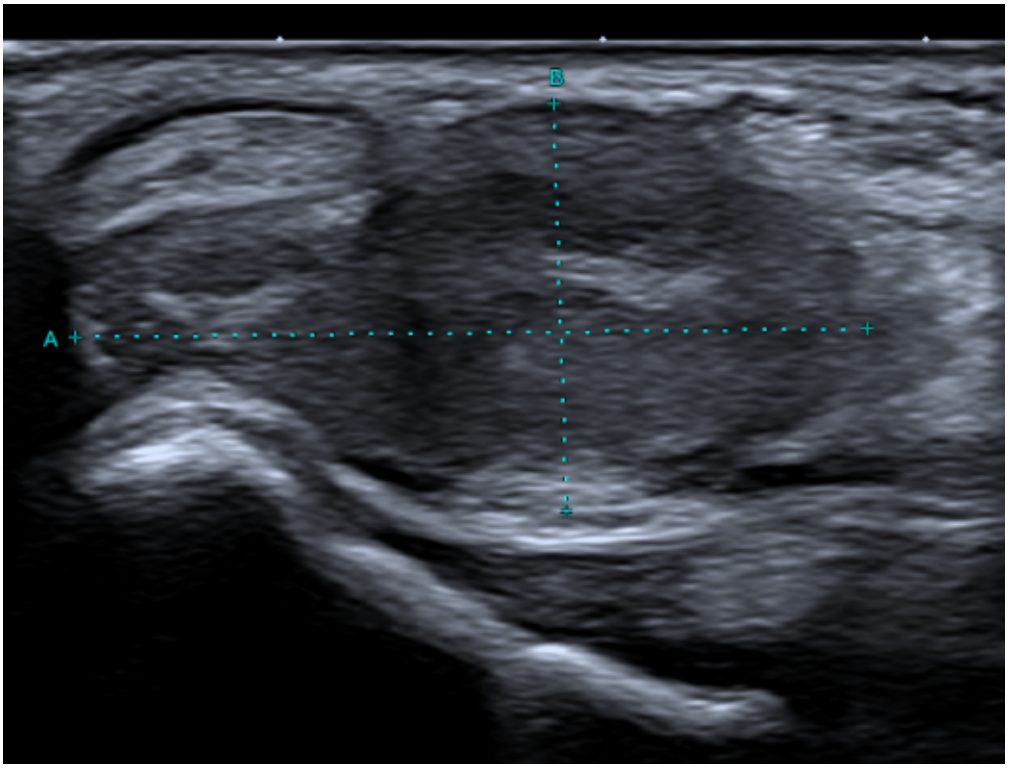
Figure 5

a



Description: US longitudinal (5a) and axial (5b) show a hypoechoic and homogeneous mass, in close relationship with the tendon sheath of the extensor digitorum longus (5b). **Origin:** © Department of Musculoskeletal Radiology, Hospital Universitari de Bellvitge (HUB), Barcelona, Spain, 2024

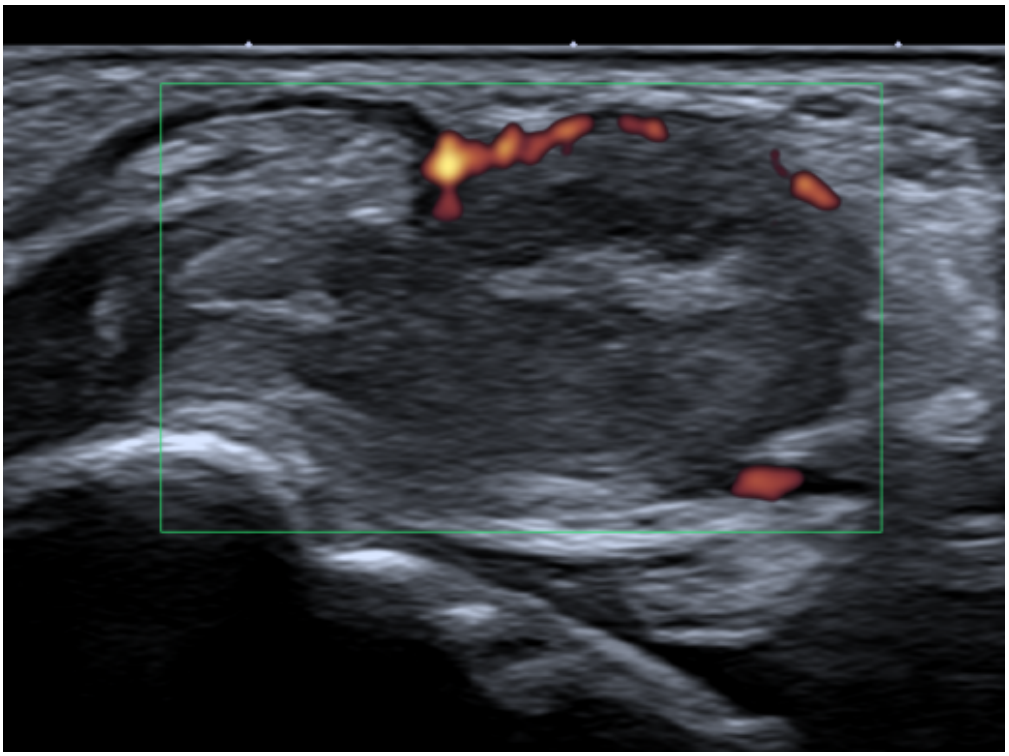
b



Description: US longitudinal (5a) and axial (5b) show a hypoechoic and homogeneous mass, in close relationship with the tendon sheath of the extensor digitorum longus (5b). **Origin:** © Department of Musculoskeletal Radiology, Hospital Universitari de Bellvitge (HUB), Barcelona, Spain, 2024

Figure 6

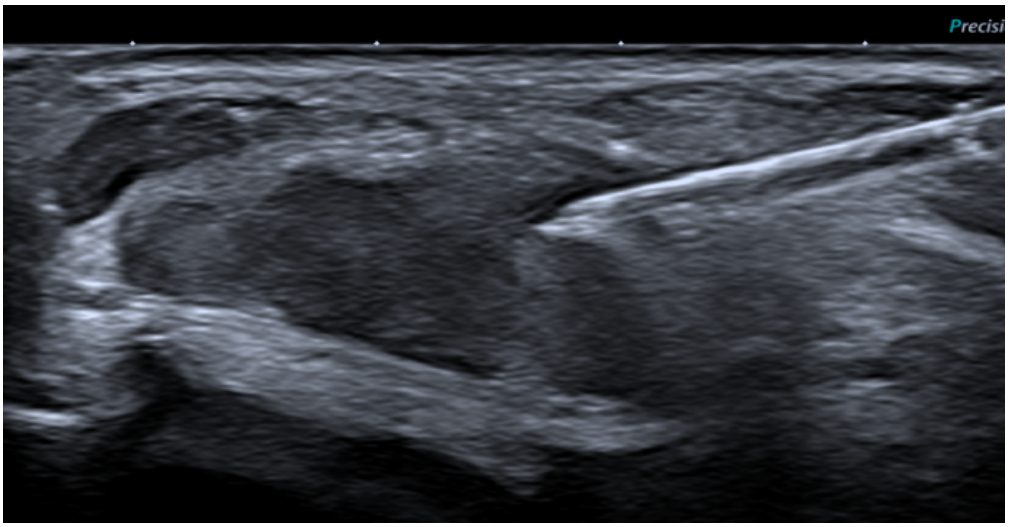
a



Description: US power Doppler shows peripheral vascularity of the lesions. **Origin:** © Department of Musculoskeletal Radiology, Hospital Universitari de Bellvitge (HUB), Barcelona, Spain, 2024

Figure 7

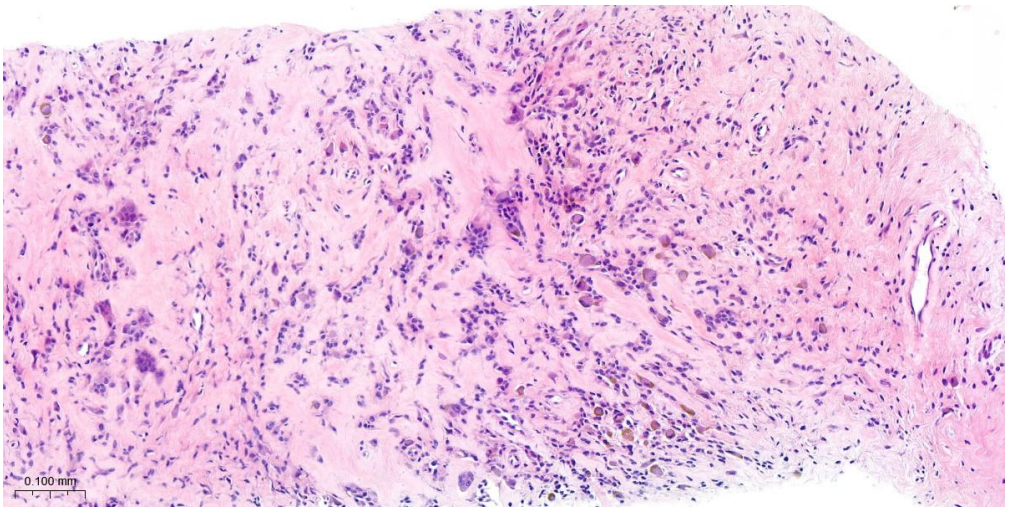
a



Description: US-guided biopsy with semi-automated needle 18 Gauge. **Origin:** © Department of Musculoskeletal Radiology, Hospital Universitari de Bellvitge (HUB), Barcelona, Spain, 2024

Figure 8

a



Description: Photomicrograph of histologic specimen shows multinucleated giant cells with abundant mononucleated cells with a fibrous stroma. Focally, hemosiderin deposits are visualised in the cytoplasm of macrophages, compatible with haemosiderophages (H and E, ×28). **Origin:** © Department of Pathology, Hospital Universitari de Bellvitge (HUB), Barcelona, Spain, 2024