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Ultrasound Features of Trigger Thumb: A Case Report

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Abstract | **Case Report**

Trigger thumb, a form of stenosing tenosynovitis, involves a mismatch between the flexor pollicis longus (FPL) tendon and the A1 pulley, leading to painful snapping and restricted thumb movement. This case report discusses a 47-year-old female presenting with classic symptoms of trigger thumb. High-resolution ultrasound and MRI were utilized to confirm the diagnosis and assess the extent of pathology. Imaging revealed characteristic findings, including A1 pulley thickening and tenosynovitis. This report underscores the pivotal role of imaging in diagnosing trigger thumb and guiding management strategies.

Keywords: Trigger thumb, Stenosing tenosynovitis, A1 pulley, Ultrasound, Imaging.

INTRODUCTION

Trigger thumb, a subtype of stenosing tenosynovitis, is characterized by a discrepancy between the size of the flexor tendon and the surrounding pulley system, particularly the A1 pulley. This condition leads to painful clicking or locking during thumb movement. While clinical examination is central to diagnosis, imaging modalities like ultrasound and MRI provide valuable insights, especially in atypical or refractory cases [1,2].

CASE PRESENTATION

A 47-year-old right-handed woman, employed in a bakery, presented with several weeks of pain and functional limitation involving the right thumb. She described difficulty in flexing and extending the thumb, accompanied by a painful snapping sensation. There was no reported trauma or relevant medical history such as diabetes or inflammatory disease. On physical examination, tenderness was noted at the volar base of the thumb, along with a palpable nodule and evident triggering during active movement. There were no signs of systemic inflammation or neurological involvement. The patient was referred for imaging to assess the soft tissue structures of the thumb.

Imaging Findings:

X-ray: Standard radiographs of the right thumb were performed and were unremarkable, showing no osseous abnormalities, joint space narrowing, or signs of degenerative or inflammatory arthropathy.

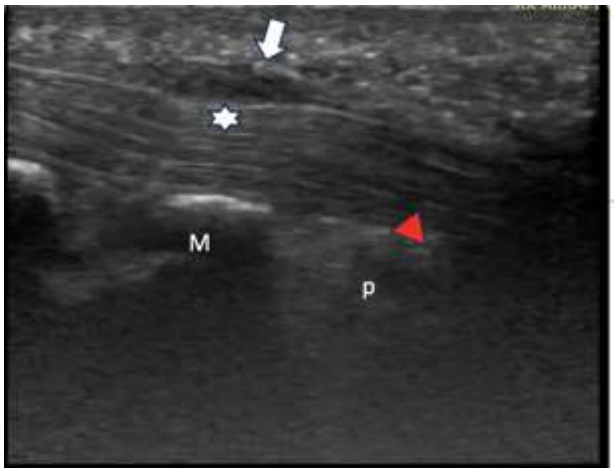
Ultrasound

High-resolution ultrasound of the right thumb demonstrated thickening of the A1 pulley, measuring approximately 1.8 mm, exceeding the normal upper limit of 0.5 mm [3]. A hypoechoic nodule was observed at the volar aspect of the FPL tendon. Dynamic assessment showed reduced tendon glide with a triggering effect. Power Doppler imaging revealed hypervascularity of the pulley region, indicative of active inflammation.

MRI

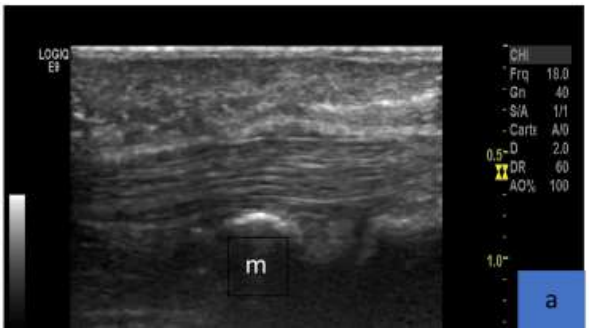
MRI was not performed as the clinical presentation and ultrasound findings were sufficient for diagnosis and management planning. In the absence of atypical features, suspected systemic disease, or refractory symptoms, advanced imaging was deemed unnecessary.

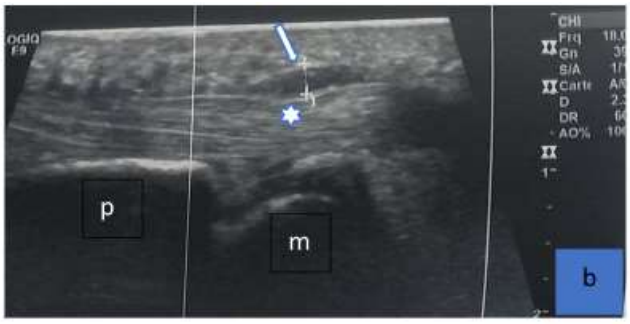
Standard anteroposterior (AP) and lateral radiographs of the affected hand were obtained. The images demonstrated no evidence of osseous abnormality. Joint spaces were preserved, and there were no signs of osteoarthritic changes, periarticular calcifications, or fractures. The alignment of the phalanges and metacarpals appeared normal. No soft tissue swelling or mass effect was appreciable



Sagittal grayscale ultrasound image of a trigger finger demonstrates thickening of the A1 pulley (white arrows) with associated stenosis (asterisk) of the flexor tendon sheath. There is evidence of tenosynovitis, shown by peritendinous hypoechoic changes (red arrowhead), and tendinosis of the flexor superficialis tendon (white arrowhead). The metacarpal head (m) and proximal phalanx (p) are labeled for orientation

Axial B-mode ultrasound image at the level of the A1 pulley in the affected thumb demonstrates marked hypoechoic thickening of the A1 pulley





a. Sagittal grayscale ultrasound image of a healthy thumb at the metacarpophalangeal (MCP) joint level. The A1 pulley appears as a thin, hypoechoic band of normal thickness (A1), overlying the flexor tendon, with preserved anatomic relationships. The metacarpal head (m) and proximal phalanx (p) are indicated for orientation.
b. Sagittal grayscale ultrasound image of the trigger thumb from the same patient. The A1 pulley is thickened (A1), causing narrowing of the underlying flexor tendon and producing a characteristic 'fingerprint' appearance on its surface (asterisk). Note the focal hypoechoic thickening of the pulley and associated mild peritendinous changes (arrowheads)

DISCUSSION

Trigger thumb is a form of stenosing tenosynovitis caused by thickening or inflammation of the A1 pulley, resulting in painful snapping due to impaired gliding of the flexor pollicis longus tendon [1]. It is most common in middle-aged women and may be linked to systemic conditions such as diabetes, rheumatoid arthritis, or hypothyroidism, as well as repetitive mechanical stress [1,5,6].

Histologically, the condition involves fibrous hypertrophy, myxoid degeneration, and synovial proliferation of the pulley system [6,7]. While diagnosis is typically clinical, imaging is essential in atypical or refractory cases. Ultrasound enables dynamic evaluation, revealing pulley thickening (>0.6 mm), tendon swelling, and increased Doppler signal in inflamed tissue [3,8]. MRI offers high-resolution, static visualization of the pulley and peritendinous inflammation, with T2-weighted hyperintensities and post-contrast enhancement highlighting tenosynovitis [4,9].

Management is usually conservative at first—rest, splinting, NSAIDs, and corticosteroid injection—particularly effective when guided by ultrasound [10]. Surgical A1 pulley release is reserved for persistent cases, with excellent outcomes and minimal recurrence [11]. Imaging plays a critical role in confirming diagnosis, evaluating severity, and guiding treatment strategies.

CONCLUSION

This case illustrates the typical clinical and radiological presentation of trigger thumb. Ultrasound and MRI are valuable diagnostic tools that can confirm clinical suspicion, identify associated inflammatory changes, and guide management strategies. Radiologists should be familiar with these imaging features to aid in early diagnosis and treatment planning.

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