

Case Report

Intersection Syndrome: How, Why and Role of Imaging

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ABSTRACT

Intersection syndrome is an overuse disorder in patients involved in repetitive flexion and extension activity of the wrist. Though onset and severity are variable, most cases respond to conservative treatment. Radiologists can play an important part in the diagnosis of this rare disorder. The gross pathology is inflammatory peritendinous edema in the first and second dorsal extensor tendon compartments around their site of intersection, about 4 to 8 cm proximal to Lister's tubercle.

Key words: Intersection, peritendinitis, Extensor.

INTRODUCTION

Intersection syndrome is an overuse disorder of the second compartment consisting of peritendinitis occurring 4 to 8 cm proximal to Lister's tubercle. This corresponds to the crossing point of the first over the second compartment tendons. Pain and swelling on the dorsal aspect of the distal forearm and wrist are common symptoms. History and physical examination often provide a specific diagnosis or limit the differential, but the diagnosis remains uncertain in a subset of patients because of an atypical presentation or because of a rarely encountered or unrecognized entity. MRI can improve the evaluation of forearm and wrist symptoms. The purpose of our study is to demonstrate the importance of ultrasound and MRI in the diagnosis of the intersection syndrome.

CASE SUMMARY

A 38 year old female patient presented in the OPD with complaints of pain and swelling over the right distal forearm on dorsal aspect for last 2 month (Figure I). The pain increased on lifting

heavy weights. Pain was not relieved even after taking analgesics. After thorough examination, clinical diagnosis of ganglion was kept and patient was sent to radiology for evaluation.



Figure I: Swelling over Dorsal Aspect of Right Forearm

The involved forearm was examined by an experienced ultrasonologist with a high frequency 10-12 MHz linear transducer. The area was scanned in the axial and longitudinal planes to detect tendon anomalies. Ultrasound showed synovial effusion within the tendon sheaths of the first and second compartment with

associated subcutaneous edema (Figure II). Subsequently MRI of forearm and wrist was done on a 3-T scanner (Signa, General Electric Medical Systems, Milwaukee) using an extremity coil in a neutral position. The parameters for these MRI examinations were as follows: axial T1-weighted conventional spin-echo images (TR/TE, 1360/7.2); axial fat-suppressed T2-weighted fast spin-echo images (TR/TE, 5400/111), and coronal fat suppressed T2-weighted spin-echo images (TR/TE; 2820/111); axial and coronal post contrast fat suppressed T1 (TR/TE; 1000/7.3)

MRI showed enlargement of tendon sheath with thickened synovial tissues around the tendons of first and second dorsal extensor compartment (Abductor pollicis longus/ extensor pollicis brevis and extensor carpi radialis longus/ extensor carpi radialis brevis) 4 cm proximal to the lister's tubercle (Figure III). Intense post contrast enhancement was noted in the tendon sheath suggestive of peritendinitis

(Figure IV). However tendons were normal in size and signal intensity. Minimal subcutaneous edema noted at this point. No evidence of muscle edema or adjacent bony involvement noted. Rests of the extensor and flexor compartment tendons were normal.

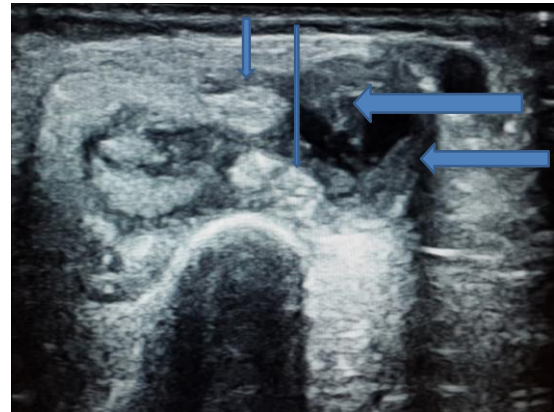


FIGURE II: Hypochoec synovial thickening and anechoic effusion (horizontal arrows) within the tendon sheaths. Vertical arrows represent normal extensor tendons.

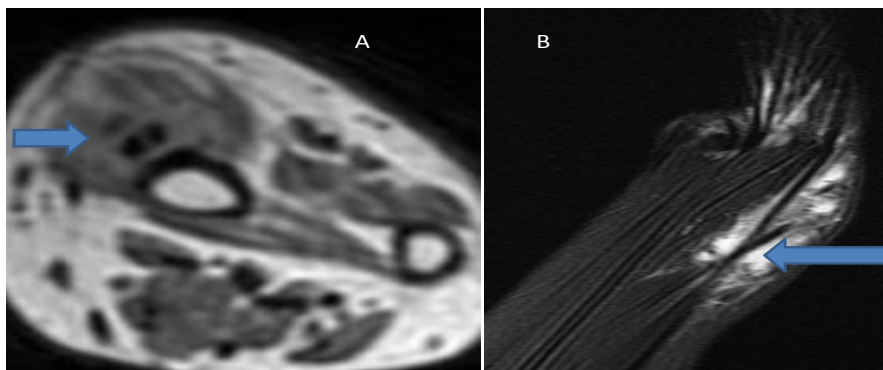


FIGURE III: A) Axial T1WI image showing enlargement of tendon sheath with thickened hypo intense synovial tissue (arrow) around the tendons.

B) Coronal T2WI fat suppressed image showing hyperintense fluid with relatively hypo intense thickened synovium at the site of crossover of extensor tendons (arrow)

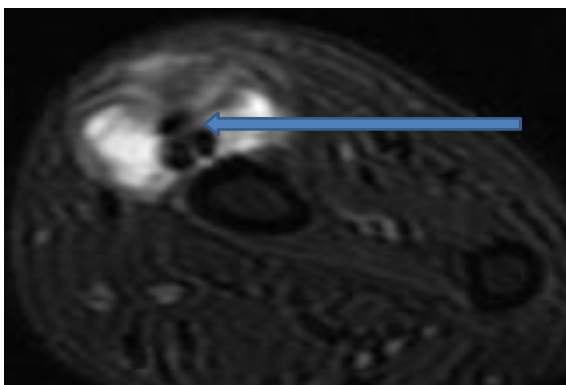


FIGURE IV: Axial post contrast T1WI showing intensely enhancing synovial tissue. Normal tendons are visualized at the cross over point (arrow).

DISCUSSION

Intersection syndrome is a focal inflammatory process affecting the second extensor compartment tendons, at the point where they cross the first extensor compartment 4 to 8 cm proximal to Lister's tubercle (junction of zones VII and VIII). This term was proposed by Dobyns et al. in 1978 referring to the intersection (at an angle of around 60°) of the

musculotendinous junctions of the first and second extensor compartment tendons. [1]

This is most commonly an overuse syndrome secondary to repetitive microtrauma from friction. It is therefore frequently seen in racquet sports, weight training, rowing, canoeing, and other activities requiring repetitive wrist extension. Symptoms may arise from either joint structures or peri-articular soft tissue. Physical examination generally reveals pain, tenderness, redness, and crepitus with flexion and extension. [2] Usually the crossover of first and second compartment tendons is 3 to 4 cm proximal to Lister's tubercle on the dorso-lateral aspect of distal forearm. Activities involving repeated extension of the wrist results in friction between the crossing tendons.

Entrapment of the extensor carpi radialis longus and extensor carpi radialis brevis tendons resulting from tendon sheath stenosis has also been identified as a causative factor. Inflammatory peritendinitis occurs in the crossing point between the first and second extensor compartments. It can have associated acute tenosynovitis or be accompanied by chronic stenosing tenosynovitis or an adventitious bursa may develop. Pain, swelling, and crepitus described as a squeak may be appreciated with wrist motion or direct palpation (squeaker's wrist). [3]

USG is usually the first examination that is carried out in patients with dorsal wrist swelling and pain. Though it is a sensitive modality, it lacks specificity. Findings include presence of peritendinous edema and synovial effusions within the tendon sheaths of the first and second compartments obliterating the normal hyper echoic plane between the two. Marked thickening of tendon sheaths and effusion can be seen in chronic cases.

MRI is essential to look for the proper anatomy and for confirmation of diagnosis. Peritendinous edema seen on fluid sensitive sequences usually surrounding the cross-over junction of the abductor pollicis longus and extensor

pollicis brevis tendons (first extensor compartment tendon) and the extensor carpi radialis longus and extensor carpi radialis brevis tendons (second extensor compartment tendon). As it is peritendinitis, tendon hypertrophy or signal changes may be absent. Tenosynovitis seen as fluid in the tendon sheath is observed approximately 4 cm proximal to the radio-carpal joint. Inflammatory changes in adjacent subcutaneous tissue can also be seen. After the administration of intravenous gadolinium, peritendinous enhancement has been described. Since the crossover of tendons is 3- 4 cm proximal to the Lister's tubercle, distal forearm should be included in the examination when there is clinical suspicion of intersection syndrome.

The main differential diagnosis is de Quervain's disease, but it is usually more distally located, thus helping to differentiate the two. Other clinical differentials include wrist ligament sprain, ganglion cyst and muscle strain. [4] Conservative treatment includes rest, nonsteroidal anti-inflammatory medications, and splinting. Surgical measures such as tenosynovectomy and fasciotomy of the abductor pollicis longus are reserved for patients who are unresponsive to therapy. [5]

CONCLUSION

Though the syndrome can be diagnosed clinically, radiology may be helpful in evaluation of proper anatomy of the involved tendons, grading of the severity, narrowing the differential diagnosis and assessment of response to therapy.

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