

MRI Imaging Features of Distal Intersection Syndrome: A Case Report

Rahul Mohan¹, Mohammad Shamim Ahmad², Pushpa Kant Tiwari², Dipu Singh¹, Prashant Shina¹, K.B. Jha¹

¹Department of Radio-Diagnosis, Narayan Medical College and Hospital, Jamuhar, Bihar, India, ²Professor, Department of Radio-Diagnosis, Narayan Medical College and Hospital, Jamuhar, Bihar, India.

Abstract

Proximal intersection syndrome is a condition that should be differentiated from Distal intersection syndrome, as there are many subtle differences in anatomical compartment. The diagnosis is made on the basis of clinical findings and confirmed by imaging studies. We present a case report of distal intersection syndrome, describing its characteristic clinical, anatomic, and MRI Imaging features.

Keywords: EPL, ECRL, ECRB

Corresponding Author: Rahul Mohan, Department of Radio-Diagnosis, Narayan Medical College and Hospital, Jamuhar, Bihar, India.

E-mail: braj_rahul@yahoo.co

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Introduction

Pain of the dorsal aspect of the distal forearm and wrist is common. Symptoms may arise from either joint structure or peri-articular soft tissue. The most frequent differential diagnosis includes wrist ligament sprain, ganglion cyst, tendinitis and muscle sprain.^[1] 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 that rarely encountered. MRI can help to narrow the differential and improve the evaluation of forearm and wrist symptoms. Its incidence is reported between 0.2% and 0.37%.^[2]

The distal intersection syndrome relates to tenosynovitis of the extensor pollicis longus (EPL) tendon (3rd extensor compartment), where it crosses the extensor carpi radialis longus (ECRL) and brevis (ECRB) tendons (2nd extensor compartment).^[3] It is distinct from intersection syndrome which occurs more proximally in the forearm at the intersection of the first and second extensor compartments.

The crossing of the second extensor compartment is typically located just distal to Lister's tubercle. The tendon sheaths of the EPL and the ECRB are connected by a communicating foramen.^[4] This is probably why inflammation of the EPL tendon spreads to the second compartment or vice versa [Figure 1].

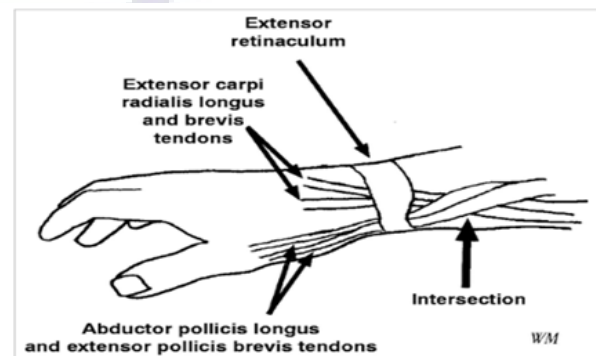


Figure 1: Diagram of anatomy of intersection point of first extensor compartment (abductor pollicis longus and extensor pollicis brevis tendons) and second extensor compartment (extensor carpi radialis longus and brevis tendons) in distal forearm.

Case Presentation

A 55 yrs old male presented with the history of chronic pain and swelling of the dorsal aspect of the left distal forearm and wrist. MRI of left wrist shows the proximal, mid and distal intercarpal joints are normal with smooth and parallel cortical bones constituting joints. No evidence of fluid collection. Carpal arch appears normal. Thickening of tendon sheath due to edema around the second and third extensor compartment tendons which appears iso-intense on

T-1 [Figure 2] & hyperintense on T2 & STIR sequence [Figure 3]. Tenosynovitis involving tendon of second and third extensor compartments.

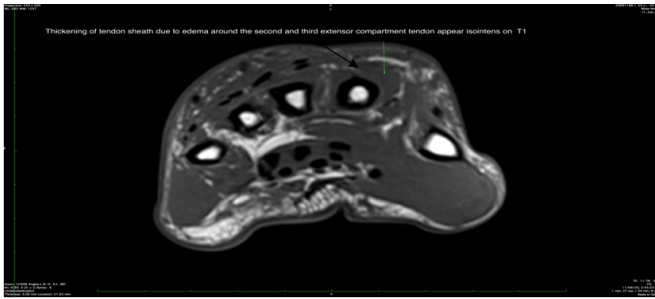


Figure 2: Thickening of tendon sheath due to edema around the second and third extensor compartment which shows isointense on T-1.

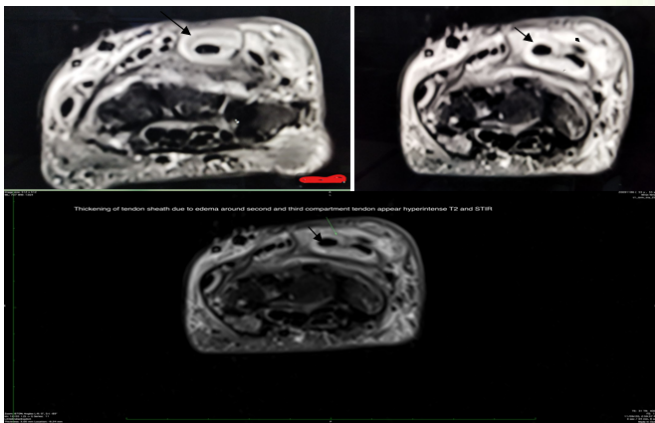


Figure 3: Thickening of tendon sheath due to edema around the second and third extensor compartment shows hyperintense on T2 & STIR sequence

Discussion

Intersection Syndrome is a specific painful disorders of the forearm. First described in 1841 by Velpeau, it has also been referred to in literature by the terms “peritendinitis crepitans”, “oarsmen’s wrist”, “crossover syndrome”, “subcutaneous perimyositis”, “squeaker’s wrist”, “bugaboo forearm”, and “abductor pollicis longus syndrome”.^[5]

Dobyns et al.^[6] introduced the term “intersection syndrome,” an anatomic designation related to the area in which the musculo-tendinous junctions of the first extensor compartment tendons (abductor pollicis longus and extensor pollicis brevis tendons) intersect the second extensor compartment tendons

(extensor carpi radialis longus and extensor carpi radialis brevis tendons), at an angle of approximately 60 [Figure 1] and which is approximately 4cm far from the Lister’s tubercle.^[5] Concerning the distal intersection syndrome there is tenosynovitis particularly of the extensor pollicis longus (EPL) tendon, where it crosses the extensor carpi radialis longus (ECRL) and brevis (ECRB) tendons. It is distinct from proximal intersection syndrome which occurs more proximally in the forearm at the intersection of the first and second extensor compartments. The particularity of our case is distal intersection syndrome which shows Tenosynovitis involving tendon of second and third extensor compartments .

There is no consensus about the pathophysiology of this condition, but this syndrome usually develops in patients involved with sports-related activities, such as rowing, canoeing, playing racket sports, horseback riding, and skiing.^[7,8] In 1994, Palmer and Lane-Larsen reported a prevalence of 11.9% in a group of 42 skiers,^[9] developing typical symptoms within the first 2 days of activity. Presentation is pain and swelling in a region about 4–8 cm proximal to the Lister tubercle, where the first and second extensor compartment tendons cross. In more severe cases, wrist motion and direct palpation may produce crepitus.

MRI is well suited to show the findings of intersection syndrome, especially with fluid-sensitive sequences. The most important finding is the presence of peritendinous edema concentrically surrounding the second and the first extensor compartments, beginning at the point of crossover, 4–8 cm proximal to the Lister tubercle and extending proximally. Peritendinitis may be a more appropriate broader term, given that there may not be tendon sheath fluid found in this location.^[10]

Symptoms resolve within 2-3 weeks in 60 % patient with rest and nonsteroid anti-inflammatory drugs, and splinting. Surgery is indicated for patients not responding to therapy. Tenosynovectomy and fasciotomy of abductor pollicis longus can be performed.

The main differential diagnosis is de Quervain’s tenosynovitis, which may require an earlier surgical intervention.^[11]

Conclusion

Intersection syndrome is an overuse disorder of the dorsal distal forearm, presenting with particular symptoms and signs that may be clinically misdiagnosed. The diagnosis is made on the basis of clinical findings, which must be confirmed by imaging studies. It may be discovered only after an MRI especially during acute or sub acute periods. Thus, radiologists must keep in mind this possibility while diagnosing wrist pains because a clinical diagnosis could be difficult in such cases.

References

1. Chung KC, Mathews AL. Management of complications of distal radius fractures. *Hand Clin.* 2015;31(2):205–215. Available from: <https://dx.doi.org/10.1016/j.hcl.2014.12.002>.
2. Yonnet J, G. Intersection syndrome in a handcyclist: case report and literature review. *Top Spinal Cord Inj Rehabil.* 2013;19(3):236–243. Available from: <https://dx.doi.org/10.1310/sci1903-236>.
3. Parellada AJ, Gopez AG, Morrison WB. Distal intersection tenosynovitis of the wrist: a lesser-known extensor tendinopathy with characteristic MR imaging features. *Skeletal Radiol.* 2007;36(3):203–211. Available from: <http://dx.doi.org/10.1007/s00256-006-0238-6>.
4. Montechiarello S, Miozzi F, D'Ambrosio I, Giovagnorio F. The intersection syndrome: Ultrasound findings and their diagnostic value. *J Ultrasound.* 2010;13(2):70–73. Available from: <https://doi.org/10.1016/j.jus.2010.07.009>.
5. Costa CR, Morrison WB, Carrino JA. MRI features of intersection syndrome of the forearm. *AJR Am J Roentgenol.* 2003;181(5):1245–1259. Available from: <https://doi.org/10.2214/ajr.181.5.1811245>.
6. Dobyns JH, Sim FH, Linscheid RL. Sports stress syndromes of the hand and wrist. *Am J Sports Med.* 1978;6(5):236–254. Available from: <https://doi.org/10.1177/036354657800600505>.
7. Servi JT. Wrist pain from overuse: detecting and relieving intersection syndrome. *Phys Sportsmed.* 1997;25(12):41–45. Available from: <https://doi.org/10.3810/psm.1997.12.1401>.
8. Williams JG. Surgical management of traumatic non-infective tenosynovitis of the wrist extensors. *J Bone Joint Surg Br.* 1977;59(4):408–418. Available from: <https://doi.org/10.1302/0301-620x.59b4.925050>.
9. Palmer DH, Lane-Larsen CL. Helicopter skiing wrist injuries. A case report of "bugaboo forearm. *Am J Sports Med.* 1994;22(1):148–149. Available from: <https://doi.org/10.1177/036354659402200124>.
10. Howard NJ. Peritendinitis crepitans. *J Bone Joint Surg Br.* 1937;19:447–459.
11. Hanlon DP, Luellen JR. Intersection syndrome: a case report and review of the literature. *J Emerg Med.* 1999;6:969–971. Available from: [https://doi.org/10.1016/s0736-4679\(99\)00125-0](https://doi.org/10.1016/s0736-4679(99)00125-0).

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