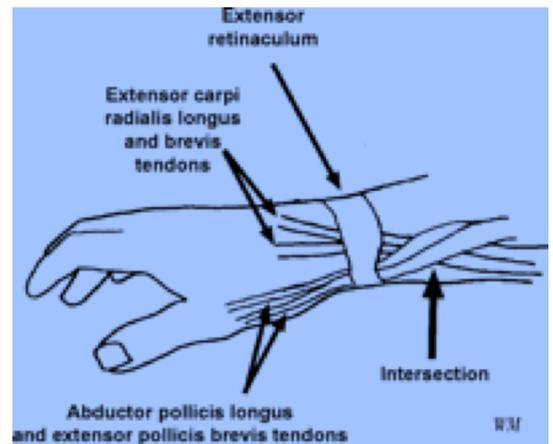


## INTERSECTION SYNDROME

### Definition:

The outcropping muscle bellies of the APL and EPB intersect with the long radial wrist extensors on the dorsal radial aspect of the distal forearm.

Intersection syndrome is an overuse disorder of the dorsal distal forearm, presenting with particular symptoms and signs that may be clinically misdiagnosed. MRI can perform an important role in establishing the diagnosis. Peritendinous edema (peritendinitis) around the first and second extensor compartment tendons, extending proximally from the crossover point, is the most characteristic finding that should suggest a diagnosis of intersection syndrome. Chronic cases may be subtle and not show substantial MRI findings likely reflecting the development of a stenosing tenosynovitis.



### Clinical

Symptoms of pain, swelling

Occasional crepitus

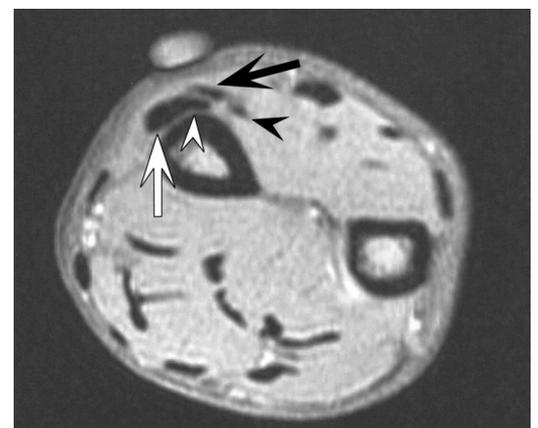
D/D de Quervain's [more distal and radial]



### MRI

Axial fat-suppressed T1-weighted shows tendon anatomy at crossover junction.

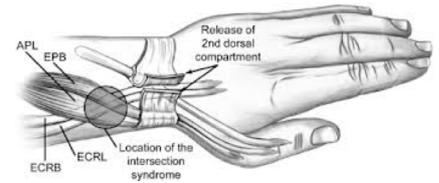
First extensor compartment tendons, abductor pollicis longus (black arrow) and extensor pollicis brevis tendons (black arrowhead), cross superficial relative to second extensor compartment tendons, extensor carpi radialis longus (white arrow) and extensor carpi radialis brevis tendons (white arrowhead)



## Treatment

Grundberg and Reagan's 1985 report on the surgical treatment of 13 patients concluded that the basic pathologic anatomy was stenosing tenosynovitis of the sheath of the common radial wrist extensors.

This description suggests that space constraints within the second compartment result in an accumulation of reactive tissue proximal to its boundaries, in the area beneath the APL and EPB tendons. Surgical decompression of the second compartment seems to be curative, indicating that this is the source of the pathology, although patient numbers are small and follow-up is limited.



## Summary

Intersection syndrome is a specific painful disorder of the forearm that is relatively common and sometimes not correctly clinically diagnosed. It has also been referred to in the literature by the terms “peritendinitis crepitans,” “oarsmen's wrist,” “crossover syndrome,” “subcutaneous perimyositis,” “squeaker's wrist,” “bugaboo forearm,” and “abductor pollicis longus bursitis” or “abductor pollicis longus syndrome.” Dobyns introduced the term “intersection syndrome,” an anatomic designation related to the area in which the musculotendinous 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°.

If the clinical index of suspicion (i.e., pretest probability) for intersection syndrome is high, advanced imaging would probably not be obtained. It is in the context of an uncertain diagnosis that MRI is likely to be used; therefore, it is relevant for a radiologist to be familiar with intersection syndrome and the imaging manifestations.

There is no consensus about the pathophysiology of this condition. Two main hypotheses regarding the pathogenesis have been postulated. One hypothesis considers intersection syndrome to be a result of friction between the muscle bellies of the first extensor compartment tendon and the adjacent tendons of the second extensor compartment. Another hypothesis implicates entrapment from stenosis.

Nevertheless, the common pathologic features are noninfectious peritendinitis and an associated local tenosynovitis in the acute setting with the potential to develop into a stenosing tenosynovitis in the chronic setting.

There is an association with sports-related activities, such as rowing, canoeing, playing racket sports, horseback riding, and skiing. In 1994, Palmer and Lane-Larsen reported a prevalence of 11.9% in a group of 42 skiers, 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.

The treatment paradigm is similar to other overuse injuries. Conservative measures are the first line of treatment. Symptoms resolve within 2–3 weeks in 60% of patients with rest, administration of nonsteroid antiinflammatory drugs, and splinting. Surgery is indicated typically only for patients not responding to therapy. When conservative treatment fails, a tenosynovectomy and a fasciotomy of abductor pollicis longus can be performed.

The main differential diagnosis is de Quervain's tenosynovitis, which may require an earlier surgical intervention. De Quervain's tenosynovitis represents an inflammatory stenosing process of the first dorsal extensor compartment tendons and differs clinically from the intersection syndrome because the presence of pain and swelling is referred to a more distal location, at the radial styloid process. Finkelstein's test is a pathognomonic physical examination finding of this condition, resulting in pain by “grasping the patients thumb and quickly abducting the hand ulnarward.”

In summary, intersection syndrome of the forearm can have unique MRI features, which have not been previously described, reflecting the proposed abnormality of peritendinous inflammation and irritation, particularly in the subacute setting. Radiologists should be aware of this condition because the clinical diagnosis may be enigmatic