

Wrist ligament pathology: diagnosis and pitfalls

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Key points:

- 1) The scapholunate and lunotriquetral ligaments are the primary stabilizers of the proximal carpal row
- 2) The triangular fibrocartilage complex is crucial to the stability of the DRUJ and ulnar carpus
- 3) Variations in MR parameters, pulse sequence, patient positioning and scan plane as well as MR imaging artifacts can decrease accuracy of diagnosis.
- 4) Normal variants of the intrinsic ligaments and TFCC can also mimic pathology

The wrist is supported by multiple ligamentous structures including the intrinsic carpal ligaments, extrinsic ligaments and triangular fibrocartilage complex (TFCC). The principle intrinsic interosseous ligaments are the scapholunate (SLL) and lunotriquetral ligaments (LTL), both of which are C-shaped and divided into dorsal, membranous and volar components. Both ligaments

should be carefully evaluated in all 3 imaging planes. The central membranous components are well seen on coronal imaging, and are prone to degenerate perforations, which are often asymptomatic. The dorsal and volar fibers of the SLL and LTL are best seen on axial images. Tears of the dorsal fibers of the SLL and the volar fibers of the LTL may lead to carpal instability. Tears can be categorized as complete or incomplete, and are either full thickness or partial thickness. MRI is relatively good at demonstrating tears of the SLL or LTL, but diagnostic accuracy can be affected by poor MR technique, or the presence of normal anatomic variants. Diagnostic accuracy is improved with MR arthrography.

The triangular fibrocartilage complex (TFCC) consists of the fibrocartilage disc proper (TFC), multiple supporting ligaments and the ECU tendon sheath. The TFCC plays an important role in axial transmission of forces from the carpus to the ulna, and is the main stabilizer of the distal radioulnar joint (DRUJ), as well as contributing to carpal stability. Ligaments include the volar ulnolunate (UL) and ulnotriquetral (UT) ligaments, dorsal and volar radioulnar ligaments, triangular ligament, ulnar collateral ligament (UCL) and the meniscal homologue (thickened fibers of distal UCL). The TFCC is best seen on coronal images, whereas the ulnocarpal ligaments are best visualized on sagittal images. A thorough knowledge of TFCC anatomy is crucial in order to accurately diagnose tears. Degenerative changes and perforations of the TFC are increasingly common with aging, and are often asymptomatic.

The dorsal and volar extrinsic carpal ligaments are important secondary stabilizers of the carpus. Although the individual ligaments can be readily identified on high resolution MR imaging, diagnostic accuracy of extrinsic ligament pathology is still relatively poor compared to arthroscopy.

In conclusion, the wrist is anatomically complex, and a thorough knowledge of anatomy and normal variants is vital for diagnostic accuracy. Correct positioning and choice of pulse sequences is also important in order to produce optimal MR images for interpretation.

References

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