The Incidence of Scapholunate, Lunotriquetral, and Triangular Fibrocartilage Complex Tears: A Cadaveric Investigation

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Introduction:

Disruption of the scapholunate (SL) or lunotriquetral (LT) ligament leads to dorsal and volar intercalated segment instability, respectively, while triangular fibrocartilage complex (TFCC) tears result in distal radioulnar joint (DRUJ) instability. Viegas et al. (1993) demonstrated that 56% of grossly visualized cadaveric wrists had one or more tears of a ligament or of the TFCC. The purpose of this investigation is to quantify the incidence, distribution, and correlation of SL, LT, and TFCC tears in a large group of cadaver wrists using magnetic resonance imaging (MRI).

Methods:

Spin density weighted, fat suppressed, and STIR MRI scans of the wrist were obtained in 48 fresh frozen cadaver arms using a 3 Tesla MRI scanner. The scans were scrutinized by one of us (PC) – a board certified musculoskeletal radiologist. The dorsal, volar, and membranous portions of the SL and LT ligaments were examined sequentially for the presence of a tear. Similarly, the central disk and radioulnar attachments of the TFCC were inspected for tears. A complete tear, partial tear, or perforation of one or more of a ligament components was considered torn. Excluded was sole degenerative changes, thinning, or fraying of the ligament fibers.

Results:

A ligament or the TFCC was labeled as torn if there was a complete tear, partial tear, or perforation of one or more of its components, but not if sole degenerative changes, thinning, or fraying of the fibers was observed. The flouroexam showed no distal radius fractures. Four of the 48 images could not be interpreted due to unsatisfactory scans. The most prevalent injury was a TFCC tear, which was present in 28 (64%) of the 44 wrists examined. SL ligament tears were discovered in 20 (45%) of the wrists, and LT tears were present in 14 (32%) of the wrists. (Figure 1 and Table 1) Moreover, 45% of the wrists examined had a TFCC tear and either a SL or LT ligament tear. (Table 2) Specifically, 50% of the 28 wrists with a TFCC tear had a concomitant LT tear, and 46% had a concomitant SL tear.

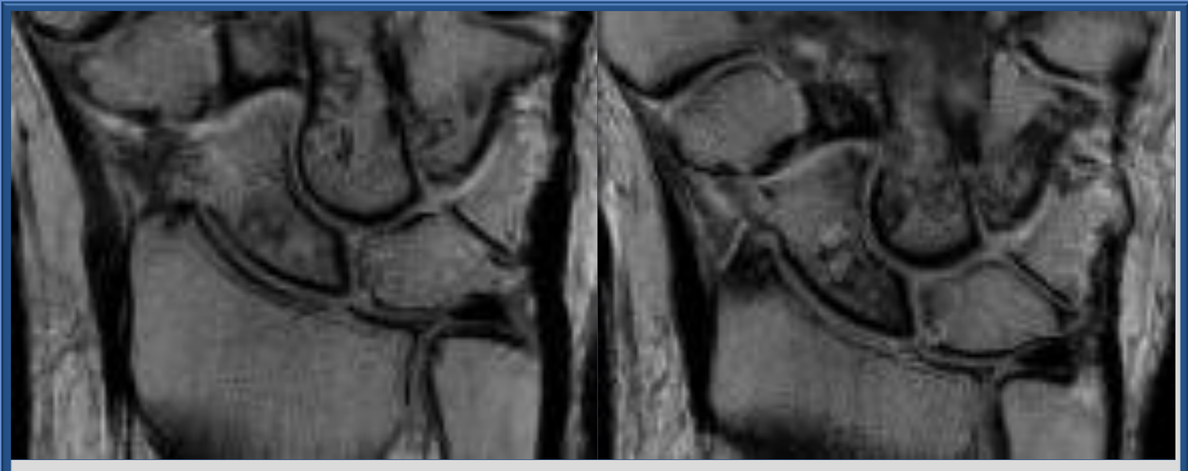

Figure 1: Complete LT and SL tears. Central TFCC disc tear

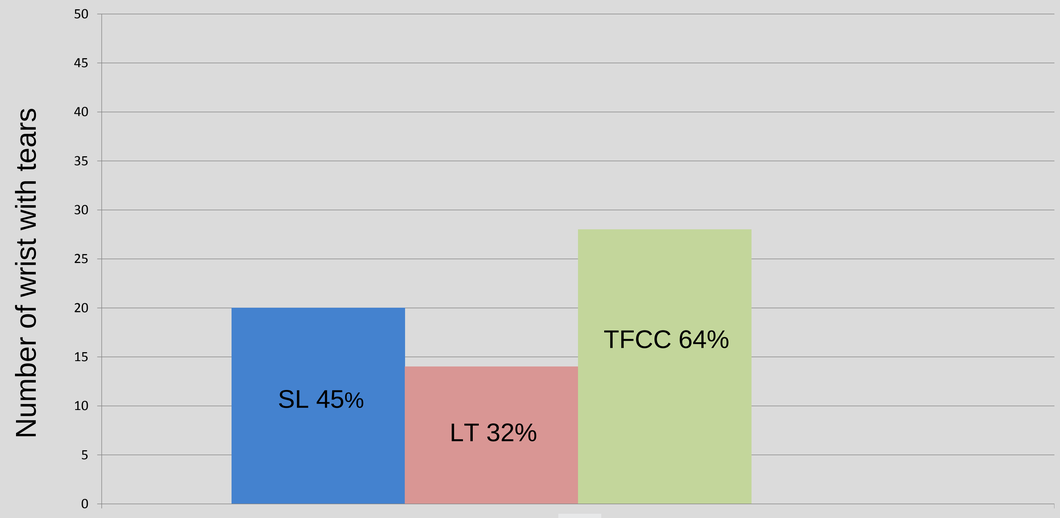

Table 1: Incidence S-L, L-T and TFCC tears in 44 specimens

No. of wrists	TFCC	SL	LT	% of wrists
28	X			64
20		X		45
14			X	32
14	X		X	32
13	X	X		30
7	X	X	X	16
7		X	X	16

Table 2. Incidence of single and multiple tears

Discussion:

SL, LT, and TFCC tears were found in a substantial portion of the wrists examined. Moreover, the majority of wrists with a TFCC tear also had a SL or LT ligament tear. Viegas et al. found that 70% of wrists with a TFCC perforation also had a LT ligament tear. In our series, 71% had a TFCC tear, and 50% of those had a concomitant LT tear.

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References:

Viegas SF, Patterson RM, Hokanson JA, Davis J. Wrist anatomy: incidence, distribution, and correlation of anatom- ic variations, tears, and arthrosis. J Hand Surg [Am] 1993; 18: 463–475.

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