

# Longitudinal Split Tears of the Ulnotriquetral Ligament

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## KEYWORDS

- Ulnotriquetral ligament • Ulnar sided wrist pain
- Longitudinal split tears • Triangular fibrocartilage complex

The complexity of soft tissue anatomy on the ulnar side of the wrist has made agreement regarding what constitutes normal anatomy difficult.<sup>1–6</sup> In addition, the large number of structures that can be injured in the ulnar wrist and the likelihood that they serve their function in a synergistic manner, make the examination and study of injuries in this region difficult. Multiple diagnoses can be made; they include peripheral tears of the triangular fibrocartilage complex (TFCC), foveal avulsions, lunotriquetral ligament injuries, extensor carpi ulnaris (ECU) tendon and subsheath pathologies, and ulnar styloid impaction,<sup>7</sup> just to name a few. As such, ulnar sided wrist pain continues to be a “black box” and is often considered the “low-back pain” in hand surgery.<sup>8</sup>

The purpose of this article is to describe the cause of chronic ulnar wrist pain arising from a longitudinal split tear of the ulnotriquetral (UT) ligament. Unlike tears of the peripheral triangular fibrocartilage (TFC) or avulsions of the distal radioulnar ligaments, longitudinal split tears of the UT ligament do not cause any instability to the distal radioulnar joint or the ulnocarpal articulation. It is mainly a pain syndrome that can be incapacitating. However, because the UT ligament arises from the palmar radioulnar (PRU) ligament

of the TFCC, it is by definition, an injury of the TFCC. According to Palmer classification, this injury is a form of type IC injury that has not been previously described.<sup>9</sup>

## ANATOMY

The PRU and dorsal radioulnar (DRU) ligaments are the primary ligamentous stabilizers of the distal radioulnar joint. The PRU and the DRU ligaments arise from the palmar and dorsal edge of the sigmoid notch, respectively. Both the ligaments converge ulnarly and interdigitate for a strong attachment to the fovea of the ulna head. From there, some of the conjoined fibers of the PRU and DRU ligaments also insert into the styloid process of the ulna.<sup>10</sup> The interval between the PRU and DRU ligaments is spanned by a sheet of fibrocartilage known as the TFC. The TFC together with the PRU and DRU ligaments forms the TFCC. The DRU ligament splits ulnarly to form part of the subretinacular sheath for the ECU tendon (**Fig. 1**). As such, the ECU subsheath is attached to the ulnar styloid and the ulnar fovea through the DRU ligament.<sup>2,4,5,11</sup>

The PRU ligament forms the proximal attachment of the ulnolunate (UL) and UT

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The authors have nothing to disclose.

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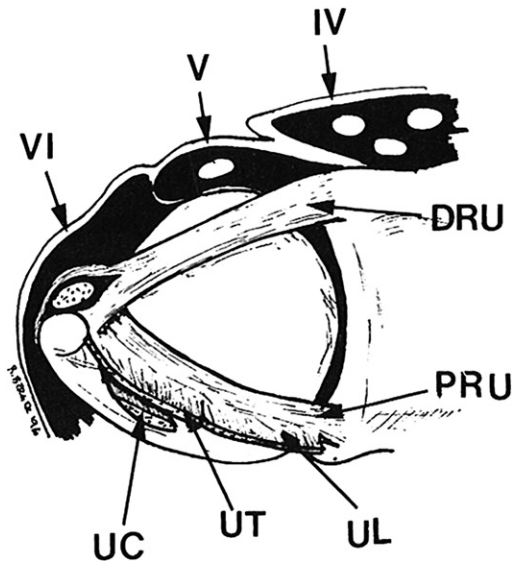
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**Fig. 1.** As seen from a distal perspective, the DRU ligament splits to form the ECU tendon subsheath, which is deep to the sixth extensor compartment (VI). The PRU ligament provides the origin for the ulnolunate (UL) and ulnotriquetral (UT) ligaments. The ulnocapitate (UC) ligament, however, is more superficial and has a direct bony attachment to the fovea of the ulnar head. (From Berger RA. The ligaments of the wrist. A current overview of anatomy with considerations of their potential functions. *Hand Clin* 1997;13(1):68, Fig 2; with permission.)

ligaments.<sup>2,4,5,11</sup> The UL ligament arises from the PRU ligament and inserts distally into the lunate on its proximal and palmar margins. The UT ligament has a more oblique orientation than the UL ligament. UT ligament arises from the PRU ligament, ulnar to the UL ligament, and the palmar radial aspect of the base of the ulnar styloid.<sup>1,5,6</sup> Distally, the UT ligament attaches to the palmar and ulnar aspects of the triquetrum.<sup>4,5</sup> Arthroscopically, there is no clear demarcation between the UL and UT ligaments. The distinction between the 2 ligaments can only be made by their distal attachments.<sup>5</sup>

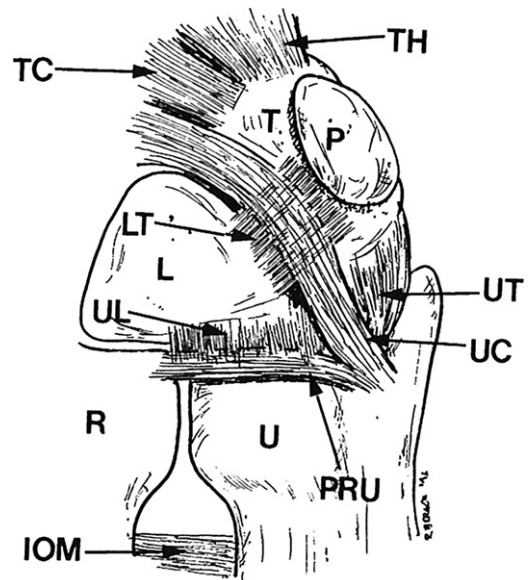
The UT ligament often contains 2 perforations, the prestyloid recess and the pisotriquetral orifice.<sup>5</sup> Arthroscopically, the prestyloid recess was found to be located at the ulnar junction between the PRU and UT ligaments.<sup>11</sup> Just distal and anterior to the prestyloid recess and anterior to the proximal articular surface of the triquetrum, is the pisotriquetral orifice, which is present in 90% of normal individuals.<sup>11</sup>

The third ligament of the ulnocarpal complex is the ulnocapitate (UC) ligament. Unlike the UL and UT ligaments, the UC ligament does not arise from the PRU ligament. From an extra-articular

perspective, the UC ligament is superficial and arises directly from the foveal region of the distal ulna bone (see Fig. 1). It travels distally, anterior to the junction of the UL and UT ligaments, until it reaches the lunotriquetral joint (Fig. 2), where it reinforces the palmar lunotriquetral ligament before interdigitating with the fibers of the radio-scaphocapitate ligament at the midcarpal joint.<sup>5</sup>

## INJURY MECHANISM

In a retrospective review by the senior author (R.A.B.), 36 patients with longitudinal split tears of the UT ligament were studied. Of them, 23 patients (64%) reported a single traumatic event preceding their symptoms, with 4 patients (11%) reporting histories consistent with repetitive trauma. No history of memorable trauma was elicited in the remaining 9 patients (15%). Of the 27 patients who reported a history of trauma, single or repetitive occurrence, 26 patients (96%) reported a mechanism of injury that involved wrist hyperextension and forearm supination.



**Fig. 2.** The palmar ulnocarpal ligaments from a palmar perspective. The UC ligament has a direct bony origin from the fovea of the ulnar head, is more superficial, and is anterior to the junction between the UL and UT ligaments. Both the UL and UT ligaments originate from the PRU ligament. The UC ligament reinforces the palmar LT ligament distally. IOM, interosseous membrane; L, lunate; LT, lunotriquetral; P, pisiform; R, radius; T, triquetrum; TC, triquetrocapitate; TH, triquetrohamate; U, ulna. (From Berger RA. The ligaments of the wrist. A current overview of anatomy with considerations of their potential functions. *Hand Clin* 1997;13(1):73, Fig 11; with permission.)

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