



WHAT IS THE CONSERVATIVE AND/OR SURGICAL TREATMENT AND PROGNOSIS OF TRIANGULAR FIBROCARILAGE INJURIES?

How do patients present?

Acute triangular fibrocartilage complex (TFCC) injuries can occur after a fall onto an outstretched hand with the wrist extended and pronated, or from a forceful rotation or distraction. They are commonly found in conjunction with distal radius fractures, being reported in up to 80% of cases.

Patients with an acutely injured TFCC injury will present with ulnar-sided wrist pain. The pain is worsened in positions that reproduce the mechanism of injury. They may also have crepitus, weakness or a sense of wrist instability. When you examine the wrist, you will find focal tenderness over the TFCC and pain on specific provocative tests. These tests include hypersupination, DRUJ loading and ulnocarpal stressing.

So what is the TFCC?

The TFCC consists of the fibrocartilage articular disc, the meniscal homolog, the palmar and dorsal radioulnar ligaments, the ulnar capsule, the extensor carpi radialis (ECU) subsheath, and the ulnolunate and ulnotriquetral ligaments. Together, these help stabilise the distal radioulnar joint (DRUJ) and the ulnocarpal joint, providing a firm support that transmits axial force across the ulnocarpal joint and allowing forearm rotation. Approximately 20% of DRUJ stability comes from contact between the ulnar head and the sigmoid notch of the radius. The remaining stability is provided by the TFCC via the palmar and dorsal radioulnar ligaments.



Are there different types of TFCC injuries?

Yes. TFCCs are classified as either acute (Palmer Class I) or chronic (Palmer Class II). These are further subdivided into subclasses depending on the location of the tear (for Class I tears) or condition of the TFCC and surrounding structures (for Class II tears). These are shown in Table 1. Sometimes, a patient will present with an acute injury but it becomes clearer that this is actually an acute exacerbation of a chronic tear.

How are TFCC tears treated?

The most important assessment to make in a patient with an acute (Class I) TFCC injury is whether the DRUJ is stable. If there is DRUJ instability, then treatment needs to stabilise it. If there is a significantly displaced fracture contributing to DRUJ instability, such as a large ulnar styloid

fracture, then this may need to be surgically fixed. If there is a position of forearm rotation where the DRUJ is acceptably stable, then a period of immobilisation in a long-arm cast in this position would allow well-vascularised peripheral tears to heal. This may be supplemented with temporary pin fixation of the distal ulna to the distal radius. Most commonly, the DRUJ is unstable in pronation and the forearm is held in full supination for up to 6 weeks.

For TFCC tears associated with a stable DRUJ, non-surgical management includes temporary splints, non-steroidal anti-inflammatory drugs, physiotherapy, and corticosteroid injection. This may allow tears to become asymptomatic despite not healing.

However, with continued symptoms after three months of non-operative management, surgery should be considered. The surgical options for acute TFCC tears include repair of the tear, debridement of the tear, ulnar shortening, and various types of ulnar head resection. The decision as to which is the most appropriate procedure depends upon the tear location, tear type, patient symptoms, ulnar variance and DRUJ stability. In general, acute peripheral tears should be repaired. Stable central tears without DRUJ instability have excellent pain relief with debridement. In the situation of an ulnar positive variance, an ulnar shortening procedure should be considered in order to offload the axial loads through the TFCC. Some of these procedures can be done arthroscopically while others require an open procedure.

Degenerative TFCC tears (Class II) are usually the result of ulnocarpal impaction, and therefore the mainstay of surgical treatment is to offload the pressures through the ulnocarpal joint. Non-operatively, this can be done with a splint that restricts wrist ulnar deviation, but patients may find this difficult to tolerate. Available surgical procedures include ulnar shortening osteotomy or one of the types of ulnar head resection.

What are the outcomes like after surgery?

Post-operative outcomes are variable, depending on the types of tear and surgery involved. After debridement of acute central tears, 70-80% of patients report complete relief of pain. Acute peripheral TFCC tears which have been repaired within 3 months of injury give 60-90% good-excellent results, with 80-90% grip strength and range of motion compared to the contralateral side. Delayed repairs give less predictable results. Radial side tears have about 85% complete relief of pain after either repair or debridement. For chronic tears, ulnar shortening gives similar pain relief compared to a combined arthroscopic TFCC debridement with partial ulnar head resection, with about 70-90% of patients having a good-excellent result.

Key points

- TFCC tears can be acute or chronic.
- Ensuring DRUJ stability is vital in the early management of acute injuries. This may require operative fixation.
- Non-surgical management includes splints, anti-inflammatory drugs, physiotherapy and injection.
- Surgery should be considered three months after non-surgical management of acute tears if pain continues.
- Good-excellent outcomes range from 60% to 90% depending on the type of tear and surgery performed.

Table 1: Palmer classification of TFCC tears

| Class | Subclass | Features |
|---------------------|----------|--|
| I: Acute, traumatic | A | Central perforation |
| | B | Ulnar avulsion ± ulnar styloid fracture |
| | C | Distal avulsion from carpus |
| | D | Radial avulsion ± sigmoid notch fracture |
| II: Degenerative | A | TFCC wear |
| | B | TFCC wear with lunate and/or ulnar head chondromalacia |
| | C | TFCC perforation with lunate and/or ulnar head chondromalacia |
| | D | TFCC perforation with lunate and/or ulnar head chondromalacia, and lunotriquetral ligament perforation |
| | E | TFCC perforation with lunate and/or ulnar head chondromalacia, and lunotriquetral ligament perforation, and ulnocarpal arthritis |

Reading list:¹⁻⁴

1. Henry MH. Management of acute triangular fibrocartilage complex injury of the wrist. *The Journal of the American Academy of Orthopaedic Surgeons*. 2008 Jun;16(6):320-9.
2. Lindau T, Adlercreutz C, Aspenberg P. Peripheral tears of the triangular fibrocartilage complex cause distal radioulnar joint instability after distal radial fractures. *The Journal of Hand Surgery*. 2000 May;25(3):464-8.
3. Palmer AK. Triangular fibrocartilage complex lesions: a classification. *The Journal of Hand Surgery*. 1989 Jul;14(4):594-606.
4. Slutsky DJ. Wrist arthroscopy. In: Wolfe SW, Hotchkiss RN, Pederson WC, Kozin SH, editors. *Green's Operative Hand Surgery*. 6 ed. Philadelphia: Elsevier; 2011.

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