

Chronologic and Geographic Trends of Triangular Fibrocartilage Complex Repair



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KEYWORDS

• Wrist • Arthroscopy • TFCC repair • Chronologic trends • Geographic trends

KEY POINTS

- The repair methods for ulnar tears were noted as inside-out, outside-in, all-inside, and open repair, with the outside-in technique being the most common.
- Although the most reported method of TFCC repair is by attachment to the joint capsule, repair of ulnar-side tears by foveal attachment has been demonstrated recently.
- The effectiveness of the repair of radial-side tears was controversial and the methods of repair reported were inside-out, outside-in, all-inside, and open repair.

INTRODUCTION

The triangular fibrocartilage complex (TFCC) is an important stabilizer of the wrist joint, specifically the distal radioulnar joint (DRUJ). Disorders of the TFCC are one of the most common causes of ulnar-side wrist pain that interferes with daily activities, such as opening a door or shaking hands.¹

The TFCC consists of four main components: (1) the triangular fibrocartilage proper (the fibrocartilage articular disk), (2) the distal radioulnar ligaments (volar and dorsal), (3) the meniscus homologue, and (4) the floor of the tendon sheath of the extensor carpi ulnaris (ECU) tendon. The

articular disk rises from the hyaline cartilage of the sigmoid notch and the lunate facet of the distal radius. The disk becomes thicker along its ulnar attachment, and is wedge-shaped at the coronal section. The distal volar and dorsal radioulnar ligaments conjoin and insert into the base of the ulnar styloid. The meniscus homologue is a connective layer between the articular disk and the triquetrum. The floor of the sheath of the extensor tendon is incorporated into the TFCC on its dorsoulnar side. The ulnar aspect of the disk has two portions: one portion inserts into the ulnar styloid, and the other inserts at the fovea of the ulnar head (**Fig. 1**).^{2,3} The deepest

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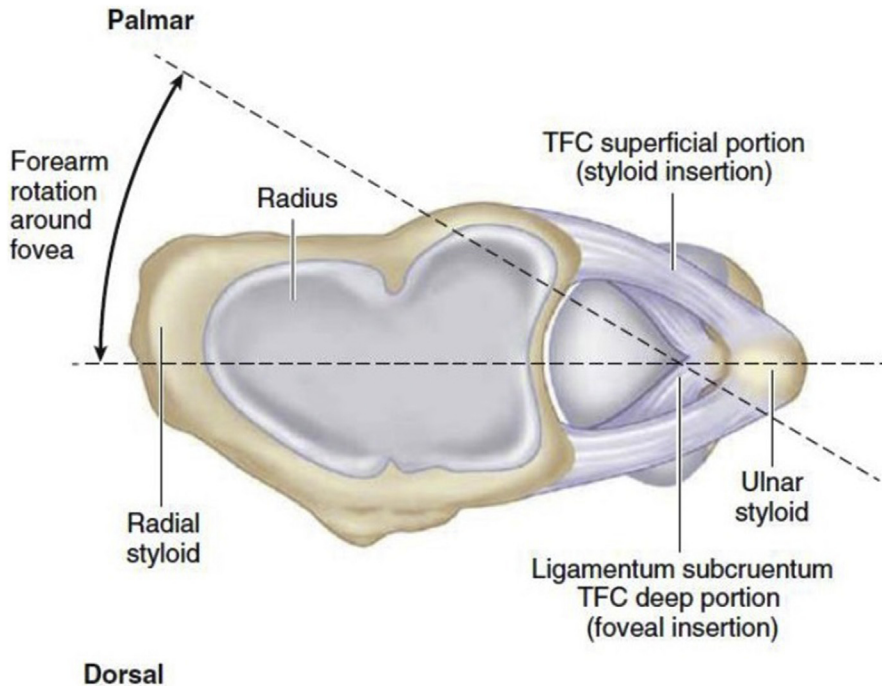


Fig. 1. Axial illustration of the TFCC. TFC, triangular fibrocartilage. (From Michelotti B, Brown M, Chung KC. Wrist arthroscopy. In: Chung KC, editor. Operative techniques: hand and wrist surgery. 3rd edition. Philadelphia: Elsevier; 2018. p. 170; with permission.)

portion has been called the ligamentum subcruentum.⁴ The foveal attachment does more than the styloid insertion to stabilize the DRUJ because it has a closer relationship to the rotational axis of the forearm.⁵ Therefore, a foveal detachment of the TFCC often results in DRUJ instability.^{2,6}

The anatomy of the blood supply to the TFCC was revealed using latex injections.⁷ There are three main arterial supplies to the TFCC: (1) the palmar and dorsal branches of the ulnar artery, (2) the dorsal branch of the anterior interosseous artery, and (3) the palmar branch of the anterior interosseous artery. Several studies have showed penetration of the vessels into about 10% to 20% of the peripheral articular disk using ink injections.^{7,8} The peripheral palmar, ulnar, and dorsal areas have good healing ability because they have sufficient vascularization, whereas the central and radial areas typically need debridement in cases of injury because they have poor blood supply.

TFCC injuries are managed initially using nonsurgical measures, such as the immobilization of the wrist and forearm, activity modification, and analgesics, for the first 2 or 3 months. Moritomo and colleagues⁹ reported that 46% of patients with avulsion of the TFCC from the fovea were

pain-free after conservative treatment. Operative treatment is considered in cases of persistent pain, DRUJ instability, and/or concomitant fractures. Operative treatment consists of open or arthroscopic debridement, and open or arthroscopic repair. These operative treatments are contraindicated for cases with severe ulnocarpal arthritis, or severe DRUJ arthritis associated with DRUJ instability.

This article reviews the classification of TFCC injuries and some repair methods based on the location of the tissue disruption. We also assess trends of TFCC repair organized by year and geographic area using literature published between 1990 and 2016 to provide current practice patterns of TFCC management around the world.

CLASSIFICATION

TFCC tears are categorized into two main classes by Palmer: class 1, traumatic lesions; and class 2, degenerative lesions (Table 1). These were further divided into subtypes.

Class 1 tears are identified based on the anatomic location of tissue disruption. Class 1A (central) tears are the most common type of traumatic TFCC tears and are debrided if

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