

Arthroscopic Management of Triangular Fibrocartilage Complex Foveal Injury

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KEYWORDS

• Inside-out • Arthroscopy • Fovea • TFCC

KEY POINTS

- It is important to make a precise diagnosis according to patient's history, meticulous physical findings, and MRI or arthrogram before operating.
- From the radiocarpal joint, the triangular fibrocartilage complex (TFCC) should be checked using the trampoline, hook, and floating sign. A distal radioulnar joint (DRUJ) scope may be introduced for a definitive diagnosis. The scope should be inserted from the radial DRUJ portal, checking the fovea using a probe or a 2.0-mm shaver.
- Enough debridement for the foveal side is important to reattach the TFCC. If the DRUJ scope can be used, shaving through the ulnar DRUJ portal is useful.
- 2-0 fiber wire is better used in the inside-out technique through the curved guide with the guide pin inserted in an oscillating manner.

INTRODUCTION: NATURE OF THE PROBLEM

The triangular fibrocartilage complex (TFCC) is an anatomically and biomechanically important 3-dimensional structure. The palmar and dorsal radioulnar ligaments of the TFCC have superficial and deep components.^{1,2} The deep component inserts on the fovea of the ulnar head. Haugstvedt and colleagues¹ demonstrated that the deep component provides greater stability than the superficial component, according to their biomechanical study of the stabilizing effect of the TFCC on the distal radioulnar joint (DRUJ). To repair the deep component indicates effectiveness of transosseous repair for foveal detachment of the TFCC in stabilizing the DRUJ. There are various methods to repair the TFCC: inside-out,³⁻¹² outside-in,¹³⁻¹⁷ and all-inside techniques.¹⁸⁻²⁵ In 2006, the author designed an inside-out repair technique²⁶ and found that it

was also applicable for TFCC foveal repair. The inside-out technique for foveal injury is now introduced. The results of the arthroscopic reattachment of TFCC fovea are discussed.

INDICATIONS

The author's indications for transosseous inside-out TFCC foveal repair are as follows:

1. Pain or click during pronation and supination
2. Positive sign for instability, fovea sign, or ulnocarpal stress test
3. Confirm avulsion of TFCC at its ulnar insertion on MRI and DRUJ arthrography

CONTRAINDICATIONS

Transosseous inside-out technique is suitable for almost all cases of foveal tear except when the

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stump of the TFCC cannot be approximated to the fovea.

SURGICAL TECHNIQUE/PROCEDURE

Preoperative Planning

DRUJ stability is assessed with the fovea sign²⁷ and instability test. A positive ulnar fovea sign may indicate fovea disruption or ulnotriquetral ligament injury. DRUJ instability is assessed by passive anteroposterior translation of the distal ulna relative to distal radius in neutral rotation, supination, and pronation when the forearm muscles are fully relaxed. The degree of translation is compared with the contralateral side. Ulnar variance should be checked by radiograph. Coronal T2 short tau inversion recovery (STIR) MRI, which includes the helical view centering around the fovea (Fig. 1) and horizontal view paralleling the ulnar head diameter passing through ulnar styloid (Fig. 2), is useful for evaluation of the TFCC foveal insertion (Fig. 3).

Preparation and Patient Positioning

The operation is performed under general anesthesia or an upper arm block with the patient in the supine position. The arm is fixed to a hand table with the shoulder in 90° abduction. An upper-arm tourniquet is applied at 90 mm Hg above the systolic blood pressure. Finger traps are applied to the index and middle fingers. About 5 kg of traction is applied, or until dimples are seen on the dorsal metacarpophalangeal joints, with the Spider system (Smith & Nephew, London and Hull, United Kingdom) or Geissler traction system (ACUMED, Hillsboro, Oregon, USA). Created are 3-4 portal,

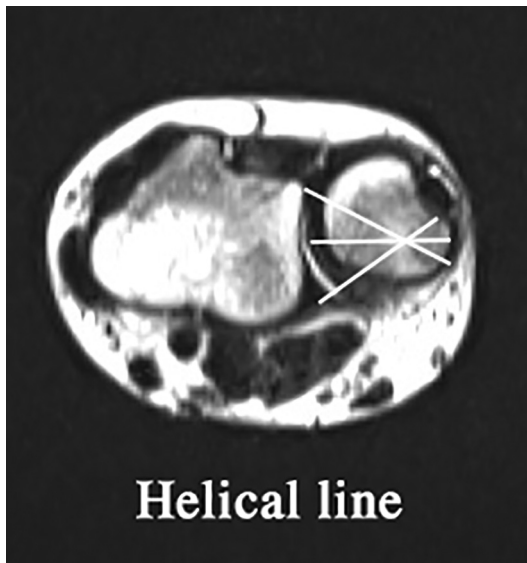


Fig. 1. MRI of helical view centering around fovea.

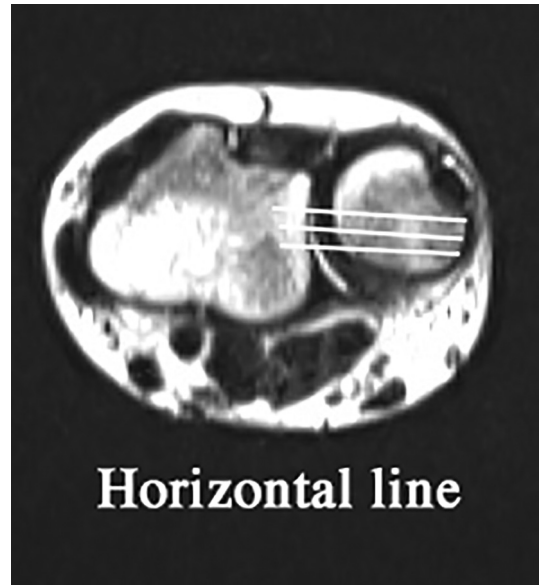


Fig. 2. MRI of horizontal view parallel to ulnar head diameter passing through the ulnar styloid.

4-5 portal, radial DRUJ portal (DRUJ-R), and ulnar DRUJ portal (DRUJ-U).

SURGICAL APPROACH

Diagnosis from Radiocarpal Joint and Distal Radioulnar Joint

Trampoline test, hook test, and floating sign from radiocarpal joint

A wrist arthroscope is inserted from the 3-4 portal for exploration to locate the TFCC tear. A probe is inserted via the 4-5 portal. The articular disc is then examined by the probe with the so-called



Fig. 3. MRI of high density in T2 STIR around TFCC foveal insertion. Arrow indicates foveal tear.

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