Minimally Invasive Approaches to Ulnar-Sided Wrist Disorders

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KEYWORDS

• Ulnar sided • Wrist pain • Triangular fibrocartilage complex • Ulnocarpal impaction
• Lunotriquetral ligament • Hamate arthrosis

KEY POINTS

- The cause of ulnar-sided wrist pain is often multifactorial.
- A thorough understanding of the anatomy, examination, and radiographic evaluation is essential when treating ulnar-sided wrist pain.
- Arthroscopy is particularly well suited to both directly visualize and treat multiple causes of ulnar sided wrist pain simultaneously.
- Arthroscopic treatment modalities for degenerative conditions such as ulnocarpal impaction and hamate arthrosis include debridement, chondroplasty, microfracture and resection.
- Low grade injury to the lunotriquetral interosseous ligament and the triangular fibrocartilage complex are often amenable to simple debridement and/or thermal shrinkage, while higher grade injuries necessitate repair.

INTRODUCTION: NATURE OF THE PROBLEM

Ulnar-sided wrist pain is a common cause of disability and has long been a diagnostic and therapeutic dilemma for practitioners, earning its titles such as the *black box* and the *low back pain of the wrist*. A thorough understanding of the anatomy, injury mechanisms, and typical clinical presentation will help establish a focused differential diagnosis. The purpose of this article is to review the evaluation and arthroscopic treatment options for the common causes of ulnar-sided wrist pain, including triangular fibrocartilage complex (TFCC) lesions, ulnocarpal impaction syndrome (UIS), lunotriquetral ligament (LTIL) tears, and hamate arthrosis.

THE TFCC

The TFCC is an important stabilizer of the wrist, and multiple studies have clarified its role in stabilization and load transmission.[1–5] TFCC tears are a major source of ulnar-sided wrist pain, and these injuries may result in significant patient disability.[6]

Patients with TFCC injuries present with mechanical wrist pain, which is exacerbated by activities that load the ulnar wrist. Acute injuries to the TFCC often occur in the setting of a fall with axial load to an extended wrist and extremes of forearm rotation. TFCC tears may be associated with pain, swelling, weakness, and a sense of instability.

The physical examination typically reveals a positive fovea sign that is tender to deep palpation in the soft spot between the ulnar styloid and flexor carpi ulnaris with the wrist in neutral rotation.[7] Ulnocarpal stress testing is performed by applying an axial load to the maximally ulnar-deviated wrist and bringing it through pronation and supination. It is a sensitive but nonspecific test for ulnar-sided pathologic conditions including TFCC tears.[8]

Imaging is an important tool in the workup of TFCC injuries. Plain radiographs are useful to assess for acute or prior trauma, ulnar variance, arthritis, and malalignment. Magnetic resonance

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imaging (MRI) with a 3.0-T magnet has been shown to have 97% accuracy in detection and 92% accuracy in localization for TFCC tears, although this depends on having an experienced musculoskeletal radiologist.[9,10]

Tears are categorized to help in treatment planning. Tears are divided into traumatic (type 1) or degenerative (type 2) according to the Palmer classification system.[11,12] Type 1A tears are generally not destabilizing to the distal radioulnar joint (DRUJ), whereas type 1B, 1C, and 1D lesions may destabilize the DRUJ and, thus, warrant a thorough evaluation for instability.[5,13] Although not formally included in the Palmer criteria, longitudinal split tears of the ulnotriquetral ligament may be grouped into the 1C category and are a source of chronic ulnar-sided pain.

Indications/Contraindications

Treatment of traumatic TFCC injuries typically begins with nonoperative measures, including immobilization, activity modification, and steroid injections. Park and colleagues[14] found that 57% of patients with TFCC injuries achieved resolution of symptoms following 4 weeks of immobilization.

For those patients who fail conservative treatment, arthroscopic debridement and possible repair are excellent treatment options.

Although not a strict contraindication, ulnar positive variance increases failure rates for both debridement and repair of the TFCC.[15–17] Increased failure rates for surgical repair of peripheral tears have also been reported in patients with advanced age, decreased supination, and loss of grip strength.[18]

Surgical Technique

Preoperative planning

Most patients must have failed conservative measures before surgery is considered. Preoperative MRI assists the surgeon in anticipating the intraoperative findings.

Preparation and patient positioning

A standard wrist arthroscopy tower is used with 10-12 lbs (4.5-5.4 kgs) of longitudinal traction placed on the index and long fingers to distract the radiocarpal joint.

Surgical approach

The standard 3–4, 4–5, and 6R portals are used for diagnostic arthroscopy.

Step 1: The stability of the TFCC should be determined using a probe to check the trampoline effect and by hooking the TFCC at the prestyloid recess.
Step 2: The type of tear is determined because the treatment algorithms vary by type.
Step 3: Treatment

Central (Palmer 1A tear) These tears do not heal because of a lack of vascularity and are, thus, treated with simple debridement to a stable edge using a 3.5-mm full-radius motorized shaver and/or a radiofrequency probe (**Fig. 1**A, B).[19] If a radiofrequency probe is used, it is important to apply it intermittently and to have an adequate outflow portal to avoid overheating. Degenerative tears in the setting of a stable DRUJ are also treated with simple debridement to a stable edge.

Peripheral (Palmer 1B) These tears are debrided with a shaver to stimulate angiogenesis at the repair site (**Fig. 2**A). Although multiple repair options are described, the authors prefer to use a FasT-Fix method.[20–27] With the arthroscope in the 6R portal, the curved FasT-Fix (Smith & Nephew Endoscopy, Andover, MA) is inserted through the 3–4 portal with the assistance of the split cannula (see **Fig. 2**B). The first polylactic

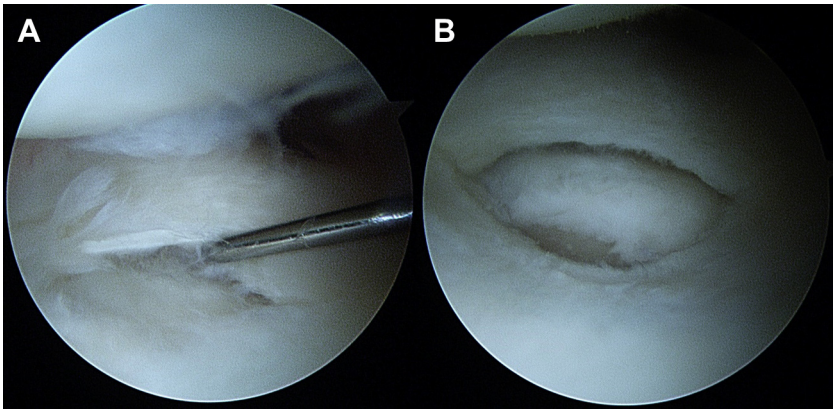

Fig. 1. Central tear is hooked to assess stability (*A*) and then debrided back to a stable edge (*B*).