Arthroscopic Volar Capsuloligamentous Repair

Francisco del Piñal, MD, PhD

1 Instituto de Cirugía Plástica y de la Mano, Private Practice and Hospital Mutua Montañesa, Santander, Spain


Abstract

Background The palmar aspect of the capsuloligamentous complex of the wrist is relatively inaccessible to surgery through an open approach. An all-inside arthroscopic suture technique is presented that allows suturing of the palmar scapholunate or lunotriquetral ligaments or plication of the space of Poirier.

Methods Eight palmar scapholunate ligaments and four major tears of the volar capsuloligamentous complex of the wrist due to a perilunate dislocation have been repaired.

Keywords
- wrist arthroscopy
- scapholunate ligament repair
- space of Poirier
- all-inside technique

Results No complications occurred during or after the procedure. It was not possible to separate the effects of the palmar repair from the disparate treatment of the associated pathology.

Conclusions The technique described allows the repair of the palmar aspect of the SL and LT ligaments safely and to repair the space of Poirier structures without need for any special equipment.

Indications

The procedure can be used to repair any of the palmar structures of the capsuloligamentous complex. In perilunate dislocation and perilunate fracture dislocation, I have used a similar technique to repair the palmar portion of the scapholunate ligament, to close the space of Poirier, and to repair the palmar portion of the lunotriquetral ligament.

Contraindications

This technique cannot be used if there is no remaining viable ligament that is amenable to suturing.

Surgical Technique

In my experience, palpation of bony prominences is crucial in determining the proper entry sites of the Tuohy needle and Kirschner wires (K-wires). For this reason, I prefer using a dry technique for wrist arthroscopy so that fluid distension will not distort the anatomy. An understanding of the all-inside technique and its possible variations is required.

The ligament stumps are first debrided with a full-radius resector and the adjacent bony surfaces refreshed with a burr inserted through the midcarpal ulnar (MCU) and midcarpal radial (MCR) portals. The scope is then positioned in the MCU portal to have an unimpeded view of the palmar SL space, while the MCR is left free for instrumentation. A 22 gauge needle inserted immediately ulnar to the flexor carpi radialis (FCR), ~1 cm proximal to the distal wrist crease, will penetrate the midcarpal joint in the vicinity of the SL space. As this may require several attempts before the position is satisfactory, an intramuscular needle, which has a smaller bore than the Tuohy, may first be used to minimize the local insult. Next, the Tuohy needle is inserted following the same path.

A (colored) 2–0 polydioxanone (PDS) suture is then threaded through the Tuohy needle, retrieved from the...
midcarpal joint with a grasper via the MCR portal, and pulled out of the joint (Fig. 2).

The Tuohy needle is then withdrawn slightly outside of the capsule (but still subcutaneous), then slid just palmar to the capsule radially, and then reinserted into the joint distal to the palmar edge of the scaphoid.

The suture is again advanced through the Tuohy needle, creating a suture loop inside the joint, which is then retrieved with the grasper and withdrawn from the joint via the MCR portal so that both ends of the suture are outside the joint. In this way a suture loop is created palmar to the capsule on both sides of the SL interval, including the long radiolunate (LRL) ligament, although this has not been verified through cadaver dissection. A gliding knot is then tied over the palmar capsule and tightened with a knot pusher, apposing the palmar aspects of the scaphoid and lunate and closing any palmar gap (Fig. 2).

It is crucial that both ends of the suture are pulled out of the joint through the same path in the MCR portal. If any tissue is interposed, the gliding knot will be blocked and cannot be advanced. A suture hook can be used to make sure that both suture ends follow the same path.

Complications

At present we have not had any complications with this technique. The palmar cutaneous branch of the median nerve is at risk, which can be minimized by making a 1-cm incision and using wound spread technique prior to introducing the Tuohy needle.

Personal Outcomes

To date we have performed eight palmar SL repairs using this technique. We combined this repair with a dorsal capsuloligamentous plication, as described by Mathoulin et al., in six cases. We also have used a similar technique to repair major tears at the space of Poirier after perilunate dislocations in four cases (Fig. 3a–f).
Because these repairs were performed in conjunction with other arthroscopic procedures for combined wrist pathology, it is not possible to separate out the effects of the palmar capsuloligamentous repair. It is my belief, however, that it is beneficial to repair these torn palmar ligaments, which is the rationale for this technique (Fig. 4).

Conflict of interest
None

References