

“Double Loop” Suture Repair in Chapter 9 Large Dorsal Tears of the Triangular Fibrocartilage Complex

Introduction

Anatomical and histological studies have clarified the three-dimensional structure of the triangular fibrocartilage complex (TFCC). There are three components: a proximal portion that inserts into the fovea, a distal “hammock-like” structure, and extrinsic ligamentous insertions forming the ulnar collateral ligament (UCL). The most common injuries of the TFCC are peripheral tears involving the distal component. However, there are sometimes large TFCC tears that extend from the styloid process and constitute a complete detachment along the dorsal aspect of the TFCC up to its insertion on the radius. These massive peripheral lesions are often associated with distal radioulnar joint (DRUJ) instability, even though the foveal insertion is intact. In such patients, traditional techniques of TFCC repair are ineffective and insufficient. This chapter describes the double loop suture technique for these extensive dorsal TFCC tears.

Operative Technique

Patient Preparation

The procedure is performed on an outpatient basis under local anesthesia. The patient is supine with the arm resting on a table with a pneumatic tourniquet. Vertical traction of 5 to 7 kg is applied to the hand.

Exploration

The arthroscope is introduced into the wrist joint through the 3–4 radiocarpal portal. A probe is inserted through the 6R portal. The massive tear of the dorsal aspect of the TFCC is identified (**Fig. 9.1a, b**), and the trampoline test and hook test are performed.

The trampoline test evaluates the tension of the TFCC. It is considered positive when the TFCC becomes loose, indicating a peripheral lesion. The trampoline sign is positive in massive dorsal tears of the TFCC.

The hook test is performed by exerting a pull on the TFCC by passing the probe into the styloid recess. The test is considered positive when the TFCC can be raised and indicates a foveal avulsion. It is negative in isolated peripheral lesions.

A full-radius shaver is then used to perform a synovectomy and to debride the torn part of the TFCC.

Triangular Fibrocartilage Repair

A hypodermic needle is introduced obliquely through the capsule and directed toward the center of the TFCC tear to determine where the distal radioulnar portal should be created. A distal radioulnar portal is then made. This portal is usually located 1 cm proximal to the 6R portal.

A loop of the 3–0 resorbable monofilament suture is passed through the needle and then through the capsule

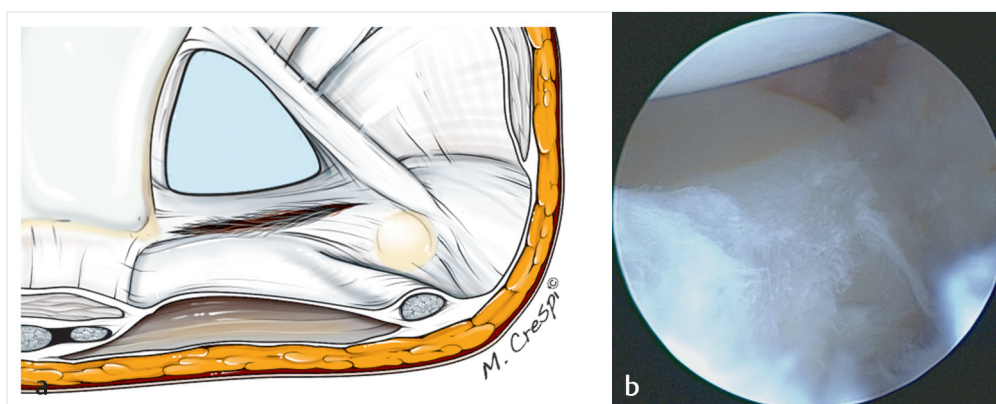
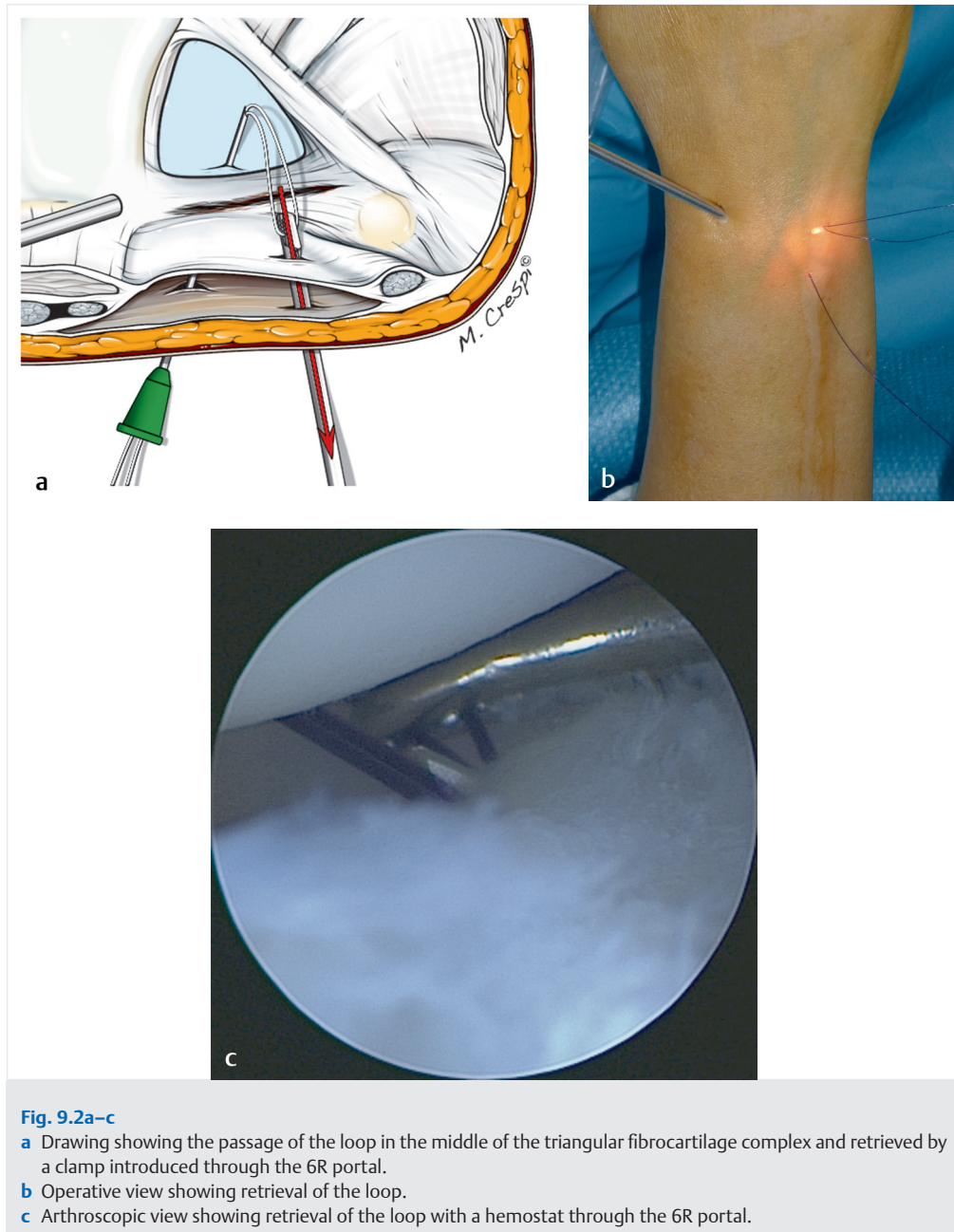


Fig. 9.1a, b

- a** Drawing of a large dorsal triangular fibrocartilage complex (TFCC) tear extending from the styloid recess and up to the dorsal level of the radial insertion of the TFCC.
- b** Arthroscopic view showing the wide tear of the TFCC.



and into the middle of the TFCC at its dorsal insertion. The suture loop is retrieved using a fine mosquito forceps inserted through the 6R portal (**Fig. 9.2a-c**).

A second hypodermic needle is inserted radial to the first needle through the same distal radioulnar portal and in the same direction, to exit near the radial insertion of the TFCC. A simple absorbable suture (3-0 or 4-0 absorbable monofilament, depending on the wrist size) is passed through the needle and retrieved through the 6R portal (**Fig. 9.3a, b**).

A third ulnar-directed hypodermic needle is then placed through the distal radioulnar portal to exit close to the styloid recess. The robust repair is achieved by passing the suture through the foveal insertion of the TFCC. A simple absorbable suture is then passed through the needle and retrieved through the 6R portal (**Fig. 9.4a-c**).

With a little practice, it is possible to recover the three sutures in a single pass to avoid soft tissue entrapment between the sutures.

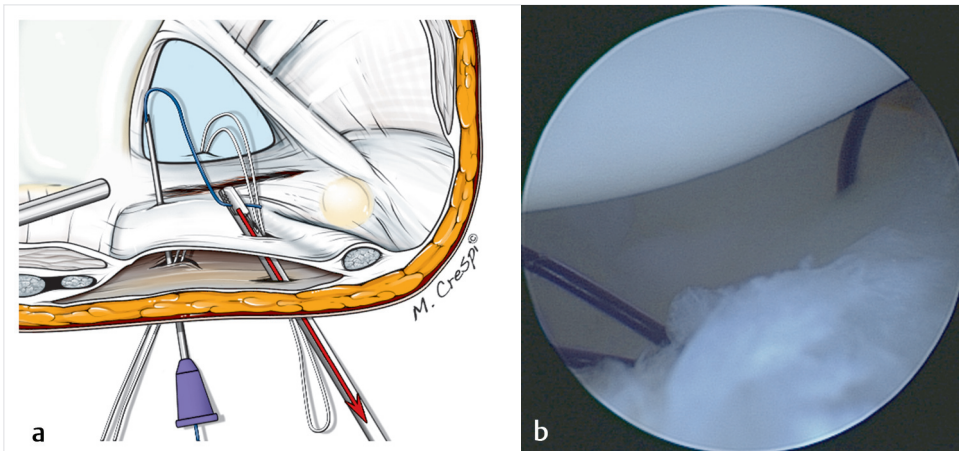


Fig. 9.3a, b

- a** Drawing showing the passage of a single suture through the dorsal radial portion of the triangular fibrocartilage complex, and retrieval through the 6R portal.
- b** Arthroscopic view showing the single suture in the radial position. The first loop is seen in the center of the lesion.

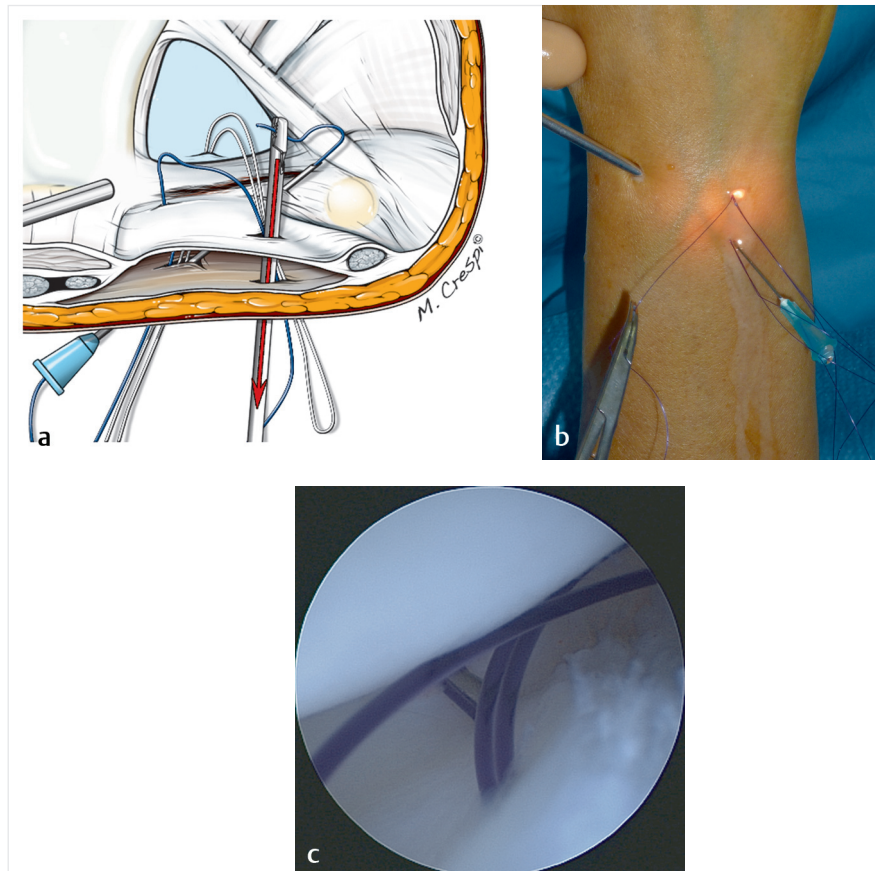


Fig. 9.4a-c

- a** Drawing showing the passage of a single suture through the ulnar part of the triangular fibrocartilage complex, and retrieval through the 6R portal.
- b** Intraoperative view showing the ulnar suture retrieved through the 6R portal; the other suture has already been retrieved.
- c** Arthroscopic view showing two single sutures on either side of the lesion, and the loop at the center of the lesion.

At this stage, there are two single sutures (one radial and the other ulnar) and the suture loop in the center passing through the DRUJ portal into the capsule and the TFCC, to emerge through the 6R portal (Fig. 9.5). The two single sutures are then passed through the central loop (Fig. 9.6a, b). The loop is then pulled at the DRUJ portal so that the other two sutures pass through the TFCC (Fig. 9.7) and out through the DRUJ portal to form two loops (“double loop”), one loop securing the lateral portion of the TFCC and the other loop securing the medial portion of the TFCC to the dorsal capsule (Fig. 9.8).

The axial/vertical traction is then released, and the suture knot is tied subcutaneously, while the wrist is in extension and in ulnar deviation (Fig. 9.9a-c).

Postoperative Care

A volar/palmar splint is applied for 6 weeks, with the wrist in slight extension and ulnar deviation. Rehabilitation is started at 6 weeks.

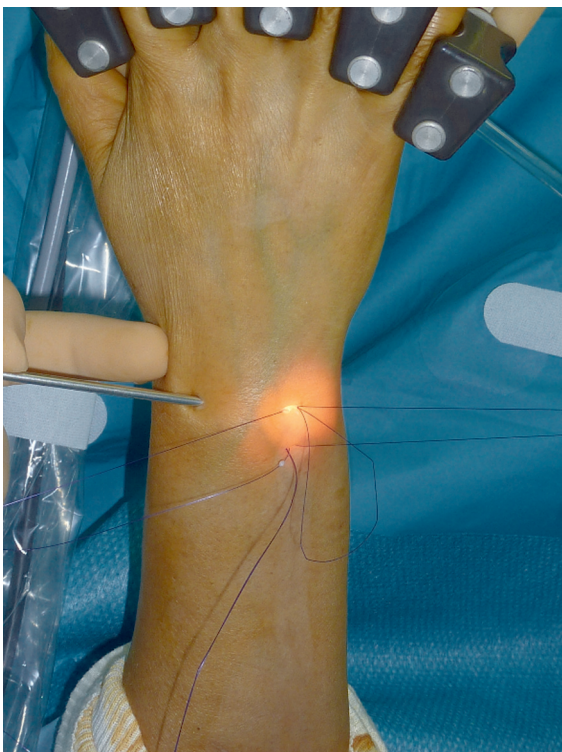
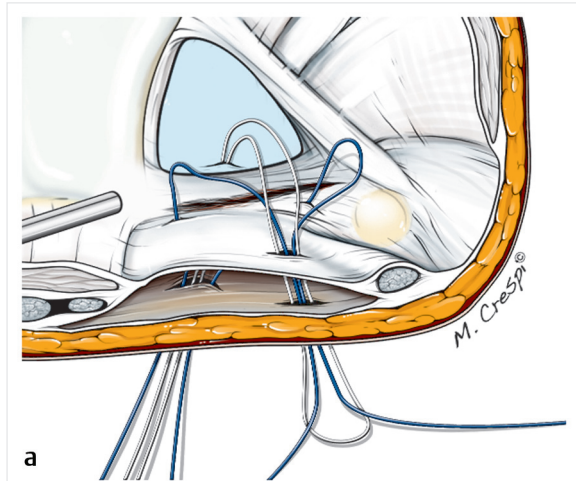


Fig. 9.5 Intraoperative view showing the principle of the suturing. The loop is in the center; the two single sutures, one on the radial side and one on the ulnar side of the triangular fibrocartilage complex tear, enter through the distal radioulnar joint portal and exit through the 6R portal.

Fig. 9.6a, b

a Drawing showing the passage of two single sutures through the loop.

b Intraoperative view showing the two single sutures passed through the loop.

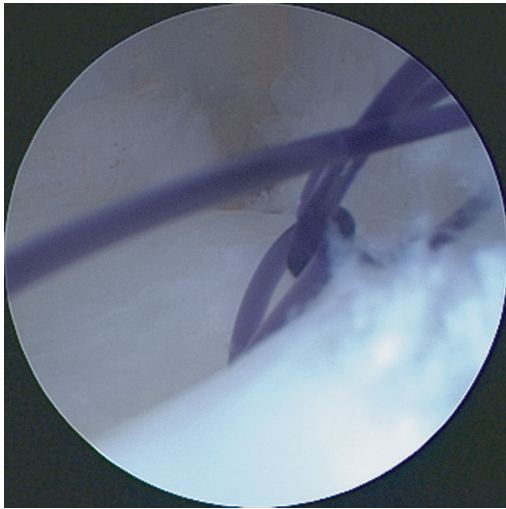


Fig. 9.7 Arthroscopic view showing the loop pulling the sutures on the radial and ulnar sides of the tear.

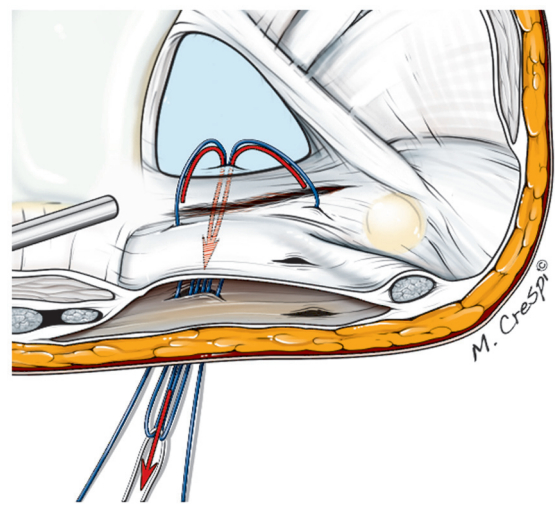


Fig. 9.8 Drawing showing the two sutures exiting at the distal radioulnar joint portal.

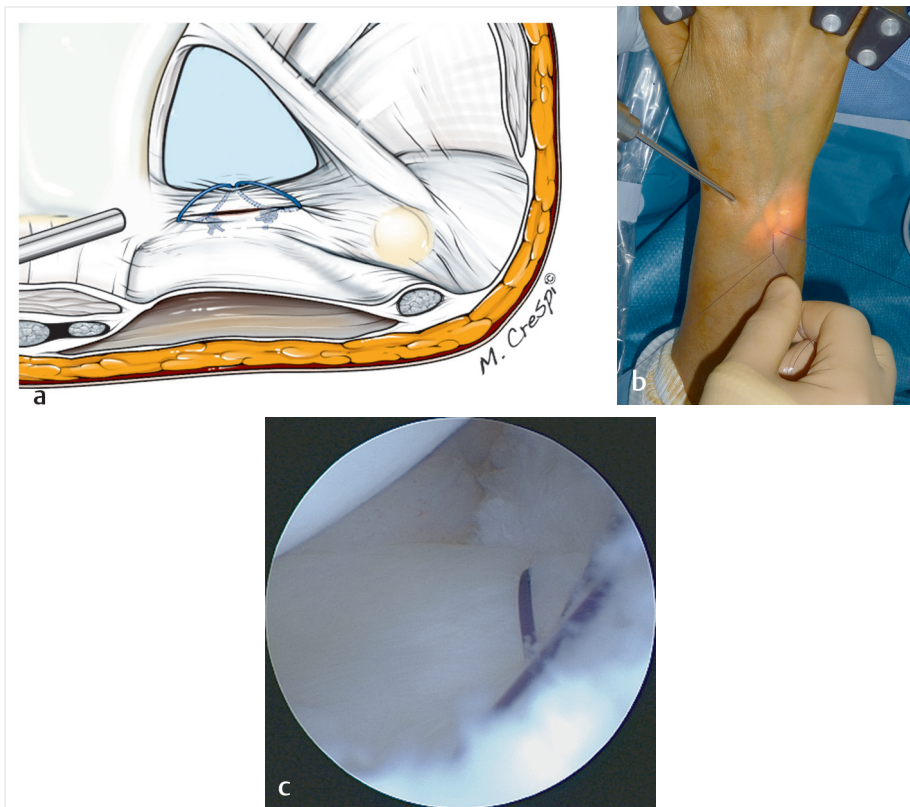


Fig. 9.9a-c

- a** Drawing showing the final position of sutures to complete the repair of a wide dorsal avulsion.
- b** Surgical view showing the completion of the suture on the radial side. The suture knot is buried subcutaneously at the distal radioulnar joint. It is easier to tie the knot after releasing the traction and by placing the wrist in extension and ulnar deviation.
- c** Arthroscopic view showing the final suture.

Conclusion

TFCC lesions are not always as simple as conventionally described. Large tears of the entire dorsal aspect of the TFCC are not so rare. These injuries are often associated with tears of the dorsal capsule–ligamentous septum (DCLS),

a structure connecting the dorsal capsule and the dorsal intercarpal (DIC) ligament to the dorsal portion of the scapholunate ligament. These types of TFCC tears can cause mild distal radioulnar instability even though the foveal insertion is still intact. The double loop suture technique allows a simple and complete repair that is easy to perform.