Subluxation of the Palmar Radioulnar Ligament As a Cause of Blocked Forearm Supination: A Case of DRUJ Locking

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Abstract

Keywords

- locking
- distal radioulnar joint
- triangular fibrocartilage complex
- pronation contracture
- radioulnar ligament

We report a case of locking of the distal radioulnar joint (DRUJ) due to interposition of a flap of the palmar radioulnar ligament (RUL) torn from the triangular fibrocartilage complex (TFCC). We released the blockage by elevating the flap and partially resecting a portion of the triangular fibrocartilage (TFC) arthroscopically.

Locking of the distal radioulnar joint (DRUJ) has been reported in five case reports.^{1–5} Previous reports described the causes of locking to include interposition of the extensor carpi ulnaris (ECU),¹ loose bodies,^{2–4} or DRUJ capsule.⁵ Although a tear of the triangular fibrocartilage complex (TFCC) may be another possible cause, this has not yet been described. We now report a case of painful locking of the DRUJ with normal pronation, but severely restricted supination due to a dislocated flap of the palmar portion of the radioulnar ligament (RUL) avulsed horizontally from the TFCC; this locking was successfully released arthroscopically.

Case Report

While moving furniture, a right-handed 35-year-old woman suddenly felt ulnar-sided pain in her right wrist and a subsequent restriction of supination. The problem persisted despite 4 weeks of cast immobilization. Four months later, she visited our hospital. On physical examination there was tenderness over the distal prominence of the ulnar head. Wrist flexion-extension and radial-ulnar deviation were normal. She could fully pronate, but supination was blocked at 15°. There was no clinical evidence of DRUJ instability. The

ulnar head could not translate normally from dorsal to palmar on the sigmoid notch of the radius while attempting pronosupination.

Radiographs were normal, with a neutral ulnar variance. An arthrogram showed leakage of the contrast medium from the radiocarpal joint into the DRUJ and also into a “double-floored” triangular fibrocartilage (TFC), which overlapped the ulnar head. This demonstrated “beak-like” shadow of the proximal TFC (►Fig. 1). An MRI was not helpful in delineating a TFC tear.

Five months after the initial injury, we performed diagnostic radiocarpal and DRUJ arthroscopy. We found a slit tear in the central portion of the articular disk (►Fig. 2a). We elevated the central longitudinal slit with a probe and noted mild chondromalacia on the palmar aspect of the ulnar head (►Fig. 2b). We advanced the arthroscope through the tear into the DRUJ and found a bundle, corresponding to the palmar radioulnar ligament (RUL), located at the proximo-palmar side of the ulnar head (►Fig. 2c), that tensed up and blocked palmar translation of the ulnar head with attempted passive supination. The elevator was inserted to the palmar side of the ulnar head, and elevated the RUL (►Fig. 2d), which then allowed normal supination.

Fig. 1 Arthrogram shows leakage of the contrast medium from the radiocarpal joint to the DRUJ. The “double-floored” triangular fibrocartilage (TFC) overlapping the ulnar head demonstrates the “beak-like” shadow of the proximal TFC (circle).

The articular disk was partially resected, because there was still a tendency for the ulnar head to interpose into the torn proximopalmar side of the RUL. Partial resection of the articular disk revealed the horizontal tear of the palmar RUL more clearly (→**Fig. 2e**). The ulnar head was interposed into the horizontal tear on the proximopalmar side of the RUL.

Since it was difficult to repair the horizontal tear arthroscopically, the forearm was fixed in maximum supination with a 1.2-mm Kirschner wire (K-wire) and an above-elbow cast was applied for 3 weeks, to keep the torn RUL reduced. Active range of motion (ROM) exercise began after removal of the K-wire and cast. The range of supination, which initially was limited to 20°, gradually increased over the next 3 months. Seven years after the surgery, there was no ulnar-sided wrist pain, no obvious DRUJ osteoarthritis radiographically, and both pronation and supination were 90°. There was no evidence of DRUJ instability.

Discussion

Only 5 cases of locking of the DRUJ have previously been reported in the literature.^{1–5} The present case is the first report of locking of the DRUJ due to a tear of the RUL. →**Fig. 3** is a diagram of the proposed mechanism of locking.

Fig. 2 (a) Radiocarpal arthroscopy demonstrates the coronal slit of the TFC (arrow). (b) Elevation of the tear revealed chondromalacia on the ulnar head. (c) DRUJ arthroscopy revealed a bundle corresponding to the palmar portion of the radioulnar ligament located at the palmar side of the ulnar head. (d) A hook probe was used to elevate the proximal edge of the bundle (arrow). (e) Partial resection of the articular disk revealed the horizontal tear of the RUL.

Fig. 3 Schematic of the TFCC and DRUJ (a) from radial to ulnarward, (b) from dorsal to palmarward). Locking occurred due to palmar displacement of the RUL, which prevented the ulnar head from palmar translation during supination.

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