Repair of the ulnar collateral ligament of the thumb

Technique and outcome in 21 patients followed for minimum 1.5 years

Savas V Sourmelis

21 patients were surgically managed using pull-out technique for acute rupture of the ulnar collateral ligament of the thumb. Clinical examinations and stress radiography in extension has been performed in all patients. Function at a mean follow up time of 3 (1.5–6) years showed excellent results in 18 patients, good in 1, and fair in 2. No complications occurred.

Orthopaedic Department, Laiko General Hospital of Athens, Athens, 115 27, Greece. Tel + 30-1-6721410. Fax -6715230

Acute rupture of the ulnar collateral ligament of the MCP joint is caused by abduction of the thumb following a fall or during sport activities, most frequently skiing. The injury is frequently misdiagnosed and if left untreated may result in instability. Immediate operative repair is superior to delayed reconstruction (Lamb and Angarita 1985).

I describe the technique for repair of the ligament in 21 patients and review the results after at least 1.5 years follow-up.

Patients and methods

From 1988–1994, I operated on 24 patients (mean age 32 years, 13 men) for an acute injury of the ulnar collateral ligament of the thumb. 3 were lost to follow-up and were excluded from this study. The dominant hand was involved in 14 patients. In 16 patients, a fall was the cause of the injury, while 2 were following a motorcycle accident, 2 occurred during football and 1 while cycling. In 6 cases there was a small displaced avulsion fracture at the base of the proximal phalanx. Operative treatment was based on physical examination and radiographic abduction stress test the MCP joint in full extension under local anesthesia. A difference more than 15° compared to the uninjured thumb or instability greater than 35° was interpreted as a Stener lesion and operative treatment was advised. 18 patients were operated on within 2 days after injury and 3 patients within a week.

Technique: A lazy S incision was made under axillary block from dorsally on the ulnar border of the first metacarpal, crossing the MCP joint and spiraling distally to the volar aspect of the proximal phalanx. The superficial sensory branches of the radial nerve are identified and protected. The adductor aponeurosis was cut parallel to the extensor pollices longus and reflected volarly. I tried to keep this thin aponeurosis intact so that it could be accurately repaired accurately The nature of the ligament rupture was identified. 12 cases had a typical Stener lesion. 6 cases had a small displaced fracture and 3 cases had a midsubstance tear.

Midsubstance tears were repaired end-to-end. Tears with a Stener lesion or avulsion fracture were repaired in a similar fashion. The small avulsion fragment was excised in 3 cases and direct ligament repair was carried out. With a K-wire, 2 holes were drilled in the proximal phalanx, entering at the ligament remnant and exiting on the radial side. From the radial side 2 hypodermic needles were inserted into the holes. A 4-0 nylon stitch was used as a crisscross stitch over the ligament. The needle of the suture was discarded and the 2 ends were inserted in the needles (Figure 1). The K-wire was then used to transfix the joint. If the preoperative radiographs showed a volar subluxation of the MCP joint, it was transfixed in the reduced position and in slight flexion. An ulnar overcorrection was used to protect the repair. Afterwards, the 2 needles were withdrawn and a knot was tied on the proximal phalanx; a button was not used (Figure 1). The divided capsule was then repaired, and was sometimes extended up to the radial side of the joint. To avoid limitation in flexion of the MCP joint, overlapping was not performed. The aponeurosis was repaired using 5-0 undyed polyglactin and the IP joint was moved to verify that the aponeurosis was gliding over the repaired ligament. At the end a volar slab was applied leaving the IP joint free to move from the 1st postoperative day to avoid adhesions between the adductor aponeurosis and the repaired ligament.

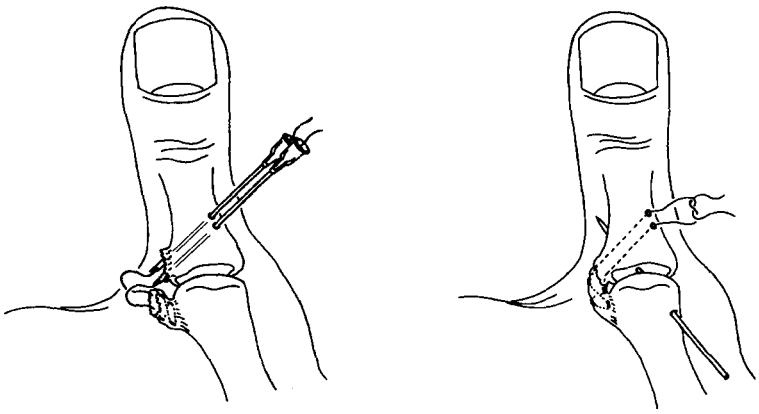


Figure 1. The stich is passed through the ligament and inserted into the hypodermic needles (left). The joint is transfixed in ulnar overcorrection and the knot is tied on the radial side of the proximal phalanx (right).

Evaluation and outcome

The mean follow-up period was 3 (1.5–6) years. The outcome was assessed according to: 1) function, 2) range of motion of MCP and IP joints of the thumb, 3) stability, and 4) pinch grip.

Function: Daily activities, stiffness of joints and pain were assessed according to Saetta et al. (1992). 18 patients were graded excellent, 1 good and 2 fair.

Motion: The average range of normal motion (ROM) of the MCP joint is between 48° and 53° (Bostock and Morris 1993). Patients graded excellent had a mean ROM of 50° (46°–53°). The ROM of the injured thumb was compared to the uninjured side and no differences greater than 4° were observed. The patient graded as good had a ROM of 46° while the two fair patients 36° and 44°, repectively. The average ROM of the IP joint in the patients graded excellent and good was 86° (82°–90°) and in those graded fair 60° and 68°, respectively.

Stability: All patients were tested in full extension for ulnar instability. The patients graded as excellent and good had laxity of up to 3° compared with the uninjured side. In the fair group the difference was 8° and 12°.

Pinch grip: Pinch grip, expressed in kg, was measured with a strain-gauge instrument. In the excellent and good group the range was from 4.2–9.4 kg. 3 patients in this group had a 20% decrease in grip compared to the uninjured. In the fair group pinch grip was 3.2 and 3.8 kg.

No skin necrosis, infection or sensory disturbance of the terminal branches of the radial nerve was observed. Only one patient with a midsubstance tear developed a swelling at the site of the repair due to scarring which was pain free.

Discussion

Diagnosing the exact pathology is essential for determining correct management. Stress radiography is a commonly used adjunct to clinical testing of laxity of the MCP joint of the thumb (Newland 1992). A Stener lesion can be identified by palpating the displaced ligament (Abrahamsson 1990) while arthography can distinguish the lesion from a nondisplaced rupture (Bowers and Hurst 1977). MRI has also been tested and proved 100% sensitive and 94% specific (Spaeth et al. 1993) but its cost for routine testing is prohibitive (Louis and Buckwalter 1989). Recently, sonography, although its accuracy depends on the examiner, proved 89% specific for diagnosing a Stener lesion (Hergan and Mittler 1995) and has been proposed to replace stress radiography that can lead to iatrogenic ligament dislocation (Noszian et al. 1995). I used clinical examination, stress radiography in extension for deciding on whether to treat surgically. I did not use stress radiography in flexion because a combined accessory and proper collateral ligament injury is uniformly present when a Stener lesion exists (Heyman et al. 1993) and also because it is difficult to perform (Newland 1992).

Controversy exists concerning which acute tears should be operated. Nondisplaced ruptures can be treated nonoperatively, but Obiltschnig and Klestil (1991) suggested that in this injury there is no contact between the ends of the ligament. A Stener lesion is usually operated (Bowers and Hurst 1977, Louis et al. 1986, Heyman et al. 1993) but functional bracing ahve been suggested in carefully selected patients (Pichora et al. 1989). Sollerman et al. (1991) compared functional bracing versus plaster cast in operated and nonoperated and found no difference except

comfort (Sollerman et al. 1991).

Although there is no agreement on the operative treatment of midsubstance tears, I feel that surgery is of value. It assures the exact anatomic position of the ligament, reduces any subluxation and repairs the dorsal capsule. With the described technique there is no need for buttons or mini-anchors which in any case carry a cost.

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