Acute rupture of the medical collateral ligament of the elbow requiring reconstruction. Case report

BE Lesin and GW Balfour
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Acute Rupture of the Medial Collateral Ligament of the Elbow Requiring Reconstruction

CASE REPORT*

BY BENJAMIN E. LESIN, M.D.†, AND GEORGE W. BALFOUR, M.D.†, VAN NUYS, CALIFORNIA

Rupture of the medial collateral ligament of the elbow may occur when a valgus stress is applied to the forearm while the humerus is fixed. The majority of such injuries appear to heal uneventfully after a period of immobilization. If healing does not occur, however, the unstable elbow that results is amenable to surgical reconstruction.

Case Report

A fifty-three-year-old male laborer sustained an injury to the right elbow when he stepped in a rut and fell, attempting to break the fall with the right hand. There was immediate, severe pain in the right elbow, and an acute valgus deformity was noted. With the aid of a fellow employee, the valgus deformity was corrected, and the patient was seen in an emergency room shortly thereafter. Anteroposterior and lateral radiographs of the right elbow showed no fracture, dislocation, or subluxation. A long posterior splint was applied to the arm, and the patient was referred to our care.

On examination two days after injury, the right elbow was swollen and ecchymotic, with blisters medially and in the antecubital area. The ulnar collateral-ligament complex was not stressed on the first examination.

The arm was immobilized in the long posterior splint for sixteen days, after which the patient started a program of active exercise under the supervision of a physiotherapist. On subsequent examinations, the patient was noted to have persistent valgus instability of the elbow that prevented minor forceful use of the extremity. A radiograph made with valgus stress applied to the forearm and with the elbow in 30 degrees of flexion showed significant medial instability (Fig. 1).

Three months after the injury, the anterior oblique ligament was reconstructed using the tendon of the palmaris longus muscle. The tip of the medial epicondyle was osteotomized and the flexor origin was retracted. A valgus force was applied to the elbow, and no medial collateral ligament was seen. Two communicating drill-holes were placed in the area of the medial epicondyle and two were placed medial to the coronoid process. The palmaris longus tendon was then woven through the drill-holes, pulled taut, and sutured to itself (Fig. 2). The medial epicondyle and flexor mass were reattached using a staple. A long posterior plaster splint was applied to the arm with the elbow in 90 degrees of flexion.

After four weeks of immobilization, the patient started a physiotherapy program involving active exercise. He regained a full range of motion as well as stability of the elbow, and he returned to performing heavy labor. Twelve months postoperatively, radiographs made with valgus stress applied to the forearm showed no opening of the medial side of the elbow (Fig. 3).

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† Valley Hand Surgery Orthopaedic Medical Group, 14624 Sherman Way, Suite 303, Van Nuys, California 91405.

Discussion

To our knowledge, very little has been written in the orthopaedic literature concerning rupture of the medial collateral ligament of the elbow. Tullos et al. reported that although the ulnar collateral-ligament complex consists of an anterior oblique, a posterior oblique, and a small transverse ligament, the anterior oblique ligament is the essential

FIG. 1

Preoperative anteroposterior radiograph of the elbow in 30 degrees of flexion with valgus stress applied to the forearm.

FIG. 2

Intraoperative photograph showing the placement of the palmaris longus tendon. A = distal articular surface of the humerus, P = palmaris longus tendon, and U = ulnar nerve.

stabilizer of the medial aspect of the elbow. This ligament extends from the ulnar surface of the medial epicondyle to a point on the medial aspect of the ulna, just distal to the coronoid process. Tullos et al. thought that the integrity of the radiocapitellar joint is only a secondary defense in resisting valgus stress.

Tullos et al. also analyzed factors that influence the stability of the elbow in daily activities. They concluded that activities involving lifting and overload, such as throwing or hammering, involve not only flexion and extension but also valgus stress as a dominant force. In addition, they pointed out that fractures of the medial epicondyle in children are avulsion injuries, and when a large fragment of bone is seen on radiographs, the origin of the anterior oblique ligament is included with the fragment and the origin of the flexors. Treatment must be directed toward restoration of the integrity of this ligament in order to prevent the possibility of chronic instability in later life.

Norwood et al. reported the cases of four athletes who sustained a rupture of the medial collateral ligament of the elbow. The injury was accurately diagnosed with methods that included stress-testing, and successful primary repair was done either by direct suture or by passing sutures through drill-holes.

As dislocations of the elbow are fairly common injuries, acute rupture of the medial collateral-ligament complex is probably more common than has been recognized in the orthopaedic literature. In all likelihood, many of these ruptures go undiagnosed after the acute injury and the majority heal uneventfully, as do most dislocations of the elbow with which significant tears of the capsule and ligaments must occur.

FIG. 3

Anteroposterior radiograph of the elbow, with valgus stress applied to the forearm, made one year postoperatively.

It appears that it would be prudent to initially treat the dislocated, traumatized elbow non-operatively even when there is a high degree of suspicion that the anterior oblique ligament has been ruptured. However, if, after conservative measures, the elbow is unstable, reconstruction of the medial collateral ligament, or more precisely of the anterior oblique ligament, with the palmaris longus can be an effective and safe procedure.

References

1. Norwood, L. A.; Shook, J. A.; and Andrews, J. R.: Acute Medial Elbow Ruptures. Am. J. Sports Med., 9: 16-19, 1981.
2. Tullos, H. S.; Schwab, Gregory; Bennett, J. B.; and Woods, G. W.: Factors Influencing Elbow Instability. *In* Instructional Course Lectures, The American Academy of Orthopaedic Surgeons. Vol. 30, pp. 185-199. St. Louis, C. V. Mosby, 1981.

Palmar Displacement of the Distal End of the Ulna in Rheumatoid Arthritis

A Case Report*

BY ROBERT J. SCHULTZ, M.D.†, GLENN SPIEGLER, M.D.†, AND LAXMI DIWAN, M.D.†, VALHALLA, NEW YORK

From the Department of Orthopaedic Surgery, New York Medical College, Valhalla

Rheumatoid arthritis produces destructive changes that result in dislocation and deformity of many joints, including the distal radio-ulnar joint. However, disruption of that joint usually is evidenced by dorsal dislocation of the distal end of the ulna. This deformity is the result of instability of the joint and can cause pain on supination and pronation. Rotatory motion of the forearm, however, is generally only partially restricted.

Although pain, clicking, and snapping of the wrist are frequent symptoms, locking of the wrist is rare[4,5,8]. The present case report concerns a patient with rheumatoid arthritis who had sudden pain and locking of the wrist with fixed supination of the forearm.

Case Report

On attempting to lift a light object, a seventy-two-year-old black woman who had rheumatoid arthritis of twenty-five years' duration felt sudden pain in the left wrist, after which she was unable to pronate the wrist. On examination, all attempts to rotate the wrist were futile, the palm remaining in supination. Examination revealed a swelling on the palmar aspect of the wrist that was apparently caused by prominence of the head of the ulna. No ecchymosis was present. The forearm was locked in 90 degrees of supination, and the wrist had 45 degrees of dorsiflexion and 30 degrees of palmar flexion. The neurocirculatory status was intact.

Radiographs of the wrist demonstrated a loss of congruity of the distal radio-ulnar joint and palmar dislocation of the distal end of the ulna (Figs. 1-A and 1-B).

In the operating room, after the administration of general anesthesia, the distal end of the ulna could be reduced closed with manual pressure on the volar aspect of the ulnar head[2]. After this maneuver the wrist and hand could be pronated, but when the forearm was supinated the distal end of the ulna redisplaced palmarward, and the wrist again was locked in supination.

The distal radio-ulnar joint was approached surgically using the technique of Bowers, and the distal end of the ulna was found to be dislocated palmarward and locked anterior to the radius. Examination of the triangular fibrocartilaginous complex revealed destruction of the dorsal and volar radio-ulnar ligaments, the meniscal disc, and the articular surfaces. The ulnar collateral ligament was found to be intact. The articular surfaces of the radio-ulnar joint were almost completely denuded of cartilage, and there were subchondral cysts. Under direct vision, pressure on the head of the ulna permitted easy reduction of the dislocation, and the forearm could be pronated. However, because of the lack of supporting structures of the distal radio-ulnar joint, when the forearm was again supinated it dislocated. There then was volar and radial translocation of the distal end of the ulna, so that the ulna abutted on the volar aspect of the distal end of the radius. The wrist again was locked in supination. In view of the extent of the destruction of the joint as well as its supporting ligaments, repair of the soft tissues was not considered appropriate, and a resection arthroplasty of the distal radio-ulnar joint with interposition of soft tissue from the palmaris longus was performed according to the technique of Bowers (Fig. 2). The wrist was maintained in pronation for three weeks, after which active motion was instituted. The patient subsequently had complete restoration of supination and pronation of the forearm.

Discussion

Hemiresection of the distal end of the ulna with interposition of soft tissue was chosen as the operation in order to maintain ulnocarpal stability. That was accomplished by preserving the ulnar collateral ligament, an important structure that helps to prevent the drift of the carpus that is so frequently seen in patients who have rheumatoid arthritis. The Darrach procedure, an operation that may be considered as an alternative, has frequently resulted in accentuation of the translocation of the ulna with rotation of the carpus and

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† Department of Orthopaedic Surgery, New York Medical College, Valhalla, New York 10595.