Therapy for elbow instability injuries

June 27, 2008
By Manish A. Patel, MD [1] and Felix H. Savoie III, MD [2]

ABSTRACT: Elbow instability often results in chronic overuse injuries, especially with overhead throwing in athletes. Initial management of medial collateral ligament (MCL) injuries often is conservative, but surgery may be required. In several studies, nearly half of throwing athletes with MCL injuries who were treated conservatively were able to return to their previous level of competition. Surgical treatment for MCL tears has evolved. Eight to 12 weeks of functional rehabilitation include advanced core-strengthening exercises, progressive neuromuscular exercises, and plyometric upper extremity training. Athletes who present with valgus extension overload should be evaluated thoroughly and considered for MCL reconstruction. Many lateral collateral ligament (LCL) complex injuries do not require surgery. Surgical reconstruction is less well defined with recurrent LCL instability. (J Musculoskel Med. 2008;25:342-344)

MEDIAL INSTABILITY

Conservative treatment

In several studies, nearly half of throwing athletes with MCL injuries who were treated conservatively were able to return to their previous level of competition in an average of 24.5 weeks. The nonoperative program that Rettig and associates\(^1\) described consists of 2 or more months of no throwing, upper extremity strengthening, and bracing; when an athlete was free of pain, they initiated a throwing program and advanced it over 1 to 2 months.

Surgery

Surgical treatment for MCL tears has evolved over several years. Early surgical management of ulnar collateral ligament (UCL) insufficiency consisted of transferring the anterior oblique ligament anteriorly and superiorly when the UCL was present but was attenuated. This approach has fallen out of favor and has been abandoned because the remaining attenuated ligament is thought to be weakened with repeated microtrauma.

For acute injuries, primary repair of the ligament has been advocated. Most ligamentous avulsions have been managed by reattaching the ligament to bone using drill holes or anchors. Mid-substance

\(^1\) Rettig and associates
ruptures were repaired primarily. Conway and coworkers\(^2\) reported the relative prevalence of MCL injury by location; 87% were midsubstance injuries, 10% were avulsions from the ulna, and 3% were avulsions from the humerus. They reported that 71% of patients treated with primary MCL repair reported good to excellent results but that only half of patients treated with primary repair were able to return to their same level of throwing.

We recently completed a study of medial UCL (MUCL) injury repair in 70 throwing athletes younger than 20 years who sustained proximal or distal injuries to the MUCL. More than 90% of the athletes were able to return to competition within 6 months. Conway, dealing primarily with professional athletes, reported better results with MCL reconstruction with the use of free graft than with primary repair in terms of the athlete's ability to return to the same level of throwing. Other reports have shown that primary MCL repair tends to have a fairly good success rate.\(^1\)\(^-\)\(^8\)

MCL reconstruction involves using a tendon graft, either autograft or allograft. Grafts used traditionally include ipsilateral or contralateral palmaris longus, fourth toe extensors, hamstring tendon, Achilles tendon, and plantaris tendon. The MCL reconstruction is fixed to bone through tunnels in the ulna at the sublime tubercle and at the humeral epicondyle. Ulnar nerve transposition may be performed in conjunction with the MCL reconstruction.

Indications for MCL reconstruction include the following: (1) acute ruptures in high-level throwers, (2) significant chronic instability, (3) debridement for calcification within the UCL and insufficient tissue to effect a primary repair in a throwing athlete, and (4) multiple episodes of recurring pain and substantial instability with throwing after 2 cycles of a supervised rehabilitation program. Jobe and colleagues\(^6\) developed the original MCL reconstruction and described the technique and the initial results in 1986.

MCL reconstruction techniques have been refined. A muscle splitting approach has been developed to avoid detachment of the flexor pronator mass, possibly with subcutaneous transposition of the ulnar nerve. Initial reports recommended MCL reconstruction with ulnar nerve transposition, but currently the recommendation is to not transfer the ulnar nerve to reduce the complication rate associated with transposition.\(^4\)

A new technique for the UCL reconstructs the central isometric fibers of the native ligament and achieves fixation of single bone tunnels in the humeral epicondyle using interference screw fixation. One report described the biomechanical result of MCL reconstruction with suture anchors to provide graft fixation onto bone compared with tunnels.\(^7\)\(^,\)\(^8\)

The elbow is splinted for the first week and then transferred to a hinged elbow brace blocked at 30° to 90° of flexion. Scapular retraction and stabilization exercises are initiated in a home program. Wrist and hand exercises also are started. Three to 4 weeks postoperatively, the brace is loosened to full range of motion. The entire upper extremity rehabilitation program is then initiated over the following 4 weeks. There are 2 cautions: (1) the patient is not allowed to have any pain over the MUCL and (2) the scapula has to be held retracted during all the exercises. Joint mobilization of the posterior shoulder girdle is emphasized while the elbow is not stretched but is allowed to regain motion within the brace at its own pace.

**Functional rehabilitation**

Eight to 12 weeks of functional rehabilitation are to include advanced core-strengthening exercises, progressive neuromuscular exercises, and plyometric upper extremity training, all with the elbow brace in place. Twelve to 16 weeks postoperative, patients return to a throw/hit program initiated with a smaller sleeve-hinge brace on the elbow. The program begins at 30 ft and progresses in 15- to 30-ft increments as the surgery site allows to at least 180-ft throws from flat ground, regardless of whether "crow hops" are achieved. Once the 180-ft distance is accomplished without pain, the brace is removed and the program restarted at 30 ft and progressed as tolerated. Most patients resume sports activity within 6 to 9 months after surgery.

Pitchers are limited to throwing at half speed on flat ground and then may gradually increase the duration of their session in 15-minute increments. Mound throwing is the last rehabilitation stage, and throwing in competition is permitted at about 6 to 12 months if the shoulder, elbow, and forearm...
are pain-free with throwing and full strength and range of motion have returned. During the rehabilitation phase, careful supervision of the body and throwing mechanics should be emphasized to prevent damage to the repair or reconstruction.

Conway and associates\(^2\) reported that 80% of patients achieved good to excellent results after 2 to 5 years of follow-up and 68% of the athletes returned to their previous level of competition for more than 1 year. More recent reviews reported that 79% to 97% of athletes were able to return to their sports activity after MCL reconstruction, although most had reconstruction without detachment of the flexor pronator muscles.\(^1\)-\(^8\)

**VALGUS EXTENSION OVERLOAD**

Athletes who present with valgus extension overload should be evaluated thoroughly and considered for MCL reconstruction. In one study, 42% of professional baseball players who underwent olecranon debridement had further surgery; valgus instability developed in 25%, and they eventually required MCL reconstruction.\(^4\)

Initial management of valgus extension overload without loose bodies consists of relative rest, the use of anti-inflammatories, and strengthening of the flexor pronator muscles. If there are posteromedial osteophytes on the olecranon, nonoperative management often is not successful. If 6 to 12 weeks of conservative management is not successful, surgical excision is indicated. Based on clinical and scientific studies, careful evaluation of the MCL is warranted. Consideration should be given to MCL reconstruction in combination with posterior debridement in patients who have combined posteromedial impingement and MCL injury. Posterior debridement should be limited to removal of osteophytes, leaving the normal olecranon tip intact.

**LATERAL INSTABILITY**

**Surgical indications**

Surgical reconstruction is less well defined with recurrent LCL instability. In some patients, recurrent instability associated with LCL insufficiency may interfere significantly with activities of daily living. Patients with LCL instability and a positive lateral pivot shift apprehension test result may be considered for LCL reconstruction. For less active patients who are prepared to modify their activities, nonsurgical management may be appropriate.

**Surgical approaches**

Osborn and Cotterill\(^9\) first described repair of the lateral capsular ligament structures of the elbow for recurrent dislocation. They postulated that the lesion was in the posterolateral ligaments and capsular structures that were torn or overly stressed during the initial dislocation. Several authors have reported similar surgical findings and have used the same type of capsular ligamentous repair when there was gross instability. Acute ligament repair currently is recommended only for gross instability after reduction of the elbow joint or in conjunction with open reduction of fracture dislocations, particularly when internal fixation of the radial head or coronoid process will be performed.

For patients with recurring lateral instability, reconstruction of the lateral UCL using a free tendon graft is recommended. Reconstruction is done at the isometric origin of the LCL, which lies at the center of rotation of the ulnar joint and is attached to the tubercle of the supinator crest several millimeters posterior to the proximal radioulnar joint.

Docking procedures described for MCL reconstruction may be used for LCL reconstruction. Smith and colleagues\(^10\) described an arthroscopic technique for managing posterolateral rotatory instability in 2001. Instability resulting from a lax LCL complex, especially the radial un hoofmeral ligament, may be managed effectively with an arthroscopic plication.

**References:**


Source URL: [http://www.psychiatrictimes.com/articles/therapy-elbow-instability-injuries](http://www.psychiatrictimes.com/articles/therapy-elbow-instability-injuries)

Links:
[1] [http://www.psychiatrictimes.com/authors/manish-patel-md](http://www.psychiatrictimes.com/authors/manish-patel-md)
[2] [http://www.psychiatrictimes.com/authors/felix-h-savoie-iii-md](http://www.psychiatrictimes.com/authors/felix-h-savoie-iii-md)