

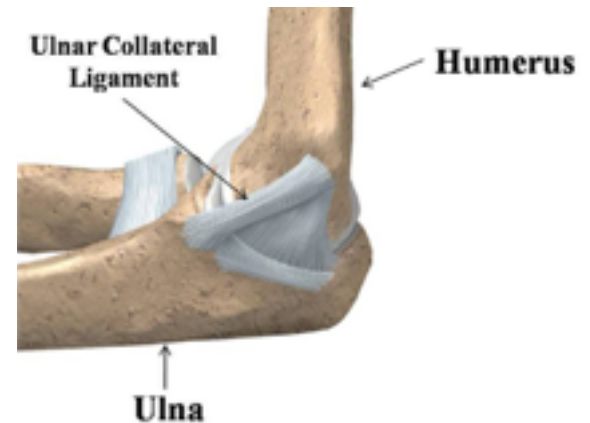
Dr. Ryan Nelson
861 Health Park Blvd.
Grand Blanc, MI 48439
(810) 953-0500
www.DrRNelson.com
ryan.Nelson@DrRNelson.com

What is the ulnar collateral ligament?

A ligament is a structure that holds bones together and helps to control the movement of joints. A good way of thinking about it is that a ligament is a tether between the bones. When the ligament is torn, the tether is too long and the bones move too much. This can lead to pain, a sense of instability or looseness, and inability to work or perform your sport.

The ulnar collateral ligament (UCL) complex is located on the inside (or medial side) of the elbow (small finger side of the arm), and is attached on one side to the humerus (the bone of the upper arm) and on the other to the coronoid process of the ulna (a bone in the forearm). It is composed of three bands or divisions — the anterior, posterior and transverse bands — with the anterior band providing the arm's primary restraint from stress to the elbow.

The largest stresses in the elbow are those forces that cause twisting and bending of the elbow, such as the throwing of a baseball or javelin. These motions put extreme stress on the ligament during certain parts of the motion.



How is the UCL injured?

The UCL can be injured in several different ways. Most commonly, there is a gradual onset of medial elbow pain due to repetitive stresses on the ligament. For athletes participating in overhead or throwing sports, poor mechanics, inflexibility or fatigue can eventually lead to muscle strain, which places more stresses on the UCL. These stresses create microscopic tears in the ligament, which can add up to one large tear over time. This gradual stress causes the ligament to stretch and become too long. Once it gets too long, it no longer holds the bones tightly enough during throwing activities.



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What are the symptoms of a UCL injury?

- A sharp “pop” or pain along the inside of the elbow joint on one particular throw, leading to the inability to continue throwing
- Pain on the inside of the elbow after a period of heavy throwing or other overhead activity
- Pain during the phase of throwing when the arm accelerates forward, just prior to releasing the ball
- Tingling or numbness in the last two fingers (pinky and ring fingers) of the hand

While the instability resulting from a tear of the UCL may inhibit the ability to participate in throwing sports, it is unlikely to impair the activities of daily living, such as carrying a bag of groceries. Interestingly, a tear of the UCL rarely prevents exercising, lifting weights, batting, running or other nonthrowing sports.

How is a tear of the UCL diagnosed?

A tear of the UCL can often be diagnosed by a physician through a history and physical examination. A valgus stress test, where a physician tests a patient’s elbow for instability, is the best way for a physician to assess the condition of the UCL.

An MRI scan and X-ray may also be done to further assess the condition of the structures in the patient’s elbow, but these tests are not the sole basis for a diagnosis. These tests often demonstrate changes in the ligament, indicating it has been under stress, which is common in athletes that throw in their sport. Sometimes it will show a definite tear in the ligament, but oftentimes an MRI alone will not provide a conclusive diagnosis. Injecting dye (gadolinium) into the joint before the MRI sometimes increases its accuracy. The most difficult part of treating a UCL problem is making the diagnosis. This is because the examination is often inexact, and the tests are not 100 percent accurate.

UCL Tear Treatment

The treatment options following a UCL tear depend primarily on the patient’s goals. If joint stability and pain relief are the patient’s main goals, then nonsurgical treatment is usually adequate. But if the patient wishes to return to strenuous overhead or throwing activities and they do not respond to nonoperative treatments, then surgical treatment of the torn UCL is recommended.

—Nonoperative Treatment

The goal of nonoperative treatment of a torn UCL is to restore stability to the elbow joint and provide pain relief to the patient. Treatment consists of an initial period of rest along with taking nonsteroidal anti-inflammatory medications — like aspirin, ibuprofen, naproxen, etc. — and applying ice to the elbow daily until the pain and swelling are gone. After inflammation of the elbow has decreased, the patient may begin physical therapy. The purpose of the physical therapy is to strengthen the muscles around the elbow to compensate for the torn ligament.

—Surgical Treatment

There are two types of surgical treatments used in dealing with a torn UCL:

- **Repair of the existing ligament**, which is only performed when the ligament has pulled away from its humeral attachment; this is known as an “avulsion” and is rare.
- **Replacement (reconstruction) of the ligament**, which is when the ligament is reconstructed using a tendon taken from somewhere else in the body — typically, the

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graft material is a tendon from the patient's own body (an autograft), but occasionally the ligament is reconstructed with a donor tendon (an allograft).

The most common tendon used for replacement is the palmaris longis tendon in the wrist and forearm, but some people are born without this tendon. Other tendons that can be used include forearm tendons, toe tendons, a hamstring tendon or part of the Achilles tendon. There are advantages and disadvantages to each.

The surgery is usually performed after a nerve block of the arm so that it is completely numb. A 10-centimeter incision is made on the inside of the patient's elbow. To expose the anterior band of the UCL, the flexor-pronator muscle in the forearm is split lengthwise. This muscle-splitting approach is less traumatic to the muscle than detaching the muscle from the bone and may allow the patient to recover faster and with less pain. However, sometimes it is necessary to release the muscles to get more exposure; the muscles are reattached and the recovery is still excellent with no known bad effects.

Tunnels are then drilled in the ulna and humerus at the site of attachment of the original anterior band of the UCL. The graft is then passed through these tunnels to form a figure-of-eight. Any remnants of the patient's original ligament are sutured into the graft to give it added strength.

What are the results of surgery?

Approximately 75 to 85 percent of athletes return to their previous level of competition following reconstruction of the UCL. Some baseball pitchers even report increased velocity after surgery. The average rehabilitation time for throwing athletes is about one year, but it may take up to 24 months for a patient to return to his or her previous ability level.

What are the potential problems of surgery?

The most common complications following surgery involve the nerves in the elbow, but fortunately these are uncommon with modern techniques. Ulnar nerve symptoms are the most common problem, and they are usually just tingling and numbness, which goes away shortly after surgery. Nerve impairments usually can be corrected by reoperation if necessary. Stretching or even a rupture of the graft is possible but very uncommon. In these cases, a new graft may be used to perform a second reconstruction.

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POST-OPERATIVE REHABILITATION PROTOCOL FOLLOWING ULNAR COLLATERAL LIGAMENT RECONSTRUCTION USING AUTOGENOUS PALMARIS LONGUS GRAFT

I. IMMEDIATE POST-OPERATIVE PHASE (0-3 weeks)

Goals:

1. Protect healing tissue
2. Decrease pain/inflammation
3. Retard muscular atrophy
4. Protect graft site – allow healing

A. Post-Operative Week 1

Brace: Posterior splint at 90 degrees elbow flexion

Range of Motion: Wrist AROM ext/flexion immediately postoperative

Elbow postoperative compression dressing (5-7 days)

Wrist (graft site) compression dressing 7-10 days as needed

Exercises: Gripping exercises Wrist ROM

- Shoulder isometrics (No Shoulder ER)
- Biceps isometrics
- Cryotherapy: To elbow joint and to graft site at wrist

B. Post-Operative Week 2

Brace: Elbow

ROM 25-100 degrees (Gradually increase ROM – 5 degrees Ext/10 degrees of Flex per week)

Exercises: Continue all exercises listed above

- Elbow Range of Motion in brace (30-105 degrees)
- Initiate elbow extension isometrics
- Continue wrist ROM exercises
- Initiate light scar mobilization over distal incision (graft)
- Cryotherapy: Continue ice to elbow and graft site

C. Post-Operative Week 3

Brace: Elbow ROM 15-115 degrees

Exercises:

Continue all exercises listed above

- Elbow ROM in brace
- Initiate active ROM Wrist and Elbow (No resistance) Initiate light wrist flexion stretching
- Initiate active ROM shoulder;
 - Full can
 - Lateral raises -ER/IR tubing
 - Elbow flex/extension
- Initiate light scapular strengthening exercises
- May incorporate bicycle for lower extremity strength & endurance

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II. INTERMEDIATE PHASE (Week 4-7)

Goals:

1. Gradual increase to full ROM
2. Promote healing of repaired tissue
3. Regain and improve muscular strength
4. Restore full function of graft site

A. Week 4

Brace: Elbow ROM 0-125 degrees

Exercises:

- Begin light resistance exercises for arm (1 lb)
 - Wrist curls, extension, pronation, supination
 - Elbow extension/flexion
- Progress shoulder program emphasize rotator cuff and scapular stabilization
- Initiate shoulder strengthening with light dumbbells

B. Week 5

ROM: Elbow ROM 0-135 degrees Discontinue brace

Continue all Exercises: Progress all shoulder and UE exercises (progress weight 1 lb.)

C. Week 6

AROM: 0-145 degrees without brace or full ROM

Exercises:

- Initiate Thrower's Ten Program
- Progress elbow strengthening exercises
- Initiate shoulder external rotation strengthening
- Progress shoulder program

D. Week 7

- Progress Thrower's Ten Program (progress weights)
- Initiate PNF diagonal patterns (light)

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III. ADVANCED STRENGTHENING PHASE (Week 8-14)

Goals:

1. Increase strength, power, endurance
2. Maintain full elbow ROM
3. Gradually initiate sporting activities

A. Week 8

Exercises:

- Initiate eccentric elbow flexion/extension
- Continue isotonic program: forearm & wrist
- Continue shoulder program – Thrower's Ten Program
- Manual resistance diagonal patterns
- Initiate plyometric exercise program
(2 hand plyos close to body only)
 - Chest pass
 - Side throw close to body
- Continue stretching calf and hamstrings

B. Week 10

Exercises:

- Continue all exercises listed above
- Program plyometrics to 2 hand drills away from body
 - Side to side throws
 - Soccer throws
 - Side throws

C. Week 12-14

- Continue all exercises
- Initiate isotonic machines strengthening exercises (if desired)
 - Bench press (seated)
 - Lat pull down
- Initiate golf, swimming
- Initiate interval hitting program

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IV. RETURN TO ACTIVITY PHASE (Week 14-32)

Goals:

1. Continue to increase strength, power, and endurance of upper extremity musculature
2. Gradual return to sport activities

A. Week 14

Exercises:

- Continue strengthening program
- Emphasis on elbow and wrist strengthening and flexibility exercises
- Maintain full elbow ROM
- Initiate one hand plyometric throwing (stationary throws)
- Initiate one hand wall dribble
- Initiate one hand baseball throws into wall

B. Week 16

Exercises:

- Initiate interval throwing program (Phase I) [long toss program]
- Continue Thrower's Ten Program and plyos
- Continue to stretch before and after throwing

C. Week 22-24

Exercises:

- Progress to Phase II throwing (once successfully completed Phase I)

D. Week 30-32

Exercises:

- Gradually progress to competitive throwing/sports