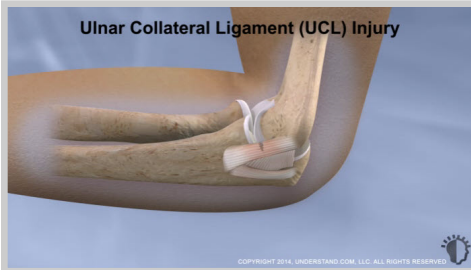


Ulnar Collateral Ligament Reconstruction (Tommy John Surgery)

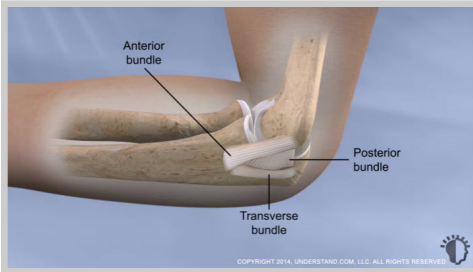
The ulnar collateral ligament stabilizes the inside of the elbow through its various flexing and extending motions. This ligament can be ruptured by sudden traumatic accidents, but more commonly, deterioration over time results from stresses related to specific, repetitive motions. For this reason, this injury is common among baseball pitchers, javelin throwers, and athletes who play volleyball, racquet sports and other activities requiring overhead throwing movements. In some cases, non-surgical treatments involving rest, anti-inflammatories, and strengthening exercises can provide relief. However, in many cases, particularly in competitive athletes whose damage worsens over time, surgery may be necessary to restore stability to the elbow and improve function. This surgery, known as ulnar collateral ligament reconstruction or Tommy John Surgery after the LA Dodgers pitcher who first underwent the procedure in 1974 and returned to competitive play, surgically replaces the ligament with a tendon from elsewhere in the body.





Introduction

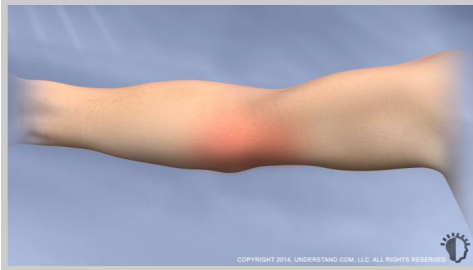
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Elbow Anatomy

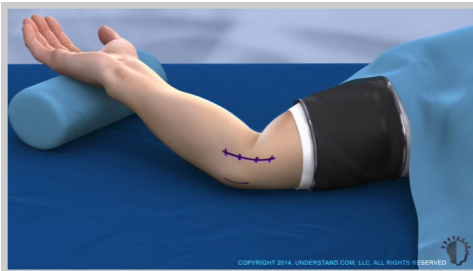
The ulnar collateral ligament or UCL, also known as the medial collateral ligament, connects the upper arm bone, the humerus, to the larger of the two bones in the forearm, the ulna, at the elbow joint. A knob-like projection from the humerus on the inner, medial side of the arm is known as the medial epicondyle, and this is the region where the ulnar collateral ligament spans the ulna and humerus. The UCL actually consists of three bands: a rounded, cord-like anterior bundle that attaches to the front side of the epicondyle, a fan-shaped posterior bundle that attaches to the back of the epicondyle, and thinner transverse or oblique bundle that merges with the ulnar side of the other two bands. Portions of these ligaments unite with other fibrous tissues to form a capsule that envelops the joint.

Outside the capsule, the ulnar nerve passes behind the medial epicondyle and over the posterior bundle of the UCL through what is known as the cubital tunnel. The location and exposure of the ulnar nerve here sometimes cause it to be damaged along with injury to the UCL; if this occurs it can be moved during UCL reconstruction.



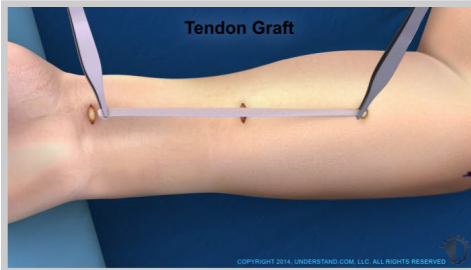
Symptoms and Diagnosis

The UCL can rupture during a single throw, in which case a pop may be felt along with intense pain. More commonly, degenerative damage to the UCL develops as pain on the inside of the elbow that is felt during and after throwing or pain in the back of the elbow when the arm is extended. If stress on the elbow also stretches or damages the ulnar nerve, pain, numbness, and tingling may be felt in the ring finger and little finger of the hand. Physical tests, your history and symptoms, and MRI imagery may be used to diagnose and confirm a UCL injury. Tears, detachments, or substantial deterioration of the UCL cause instability in the elbow and make it difficult to throw with speed and control, thereby impacting sports performance.



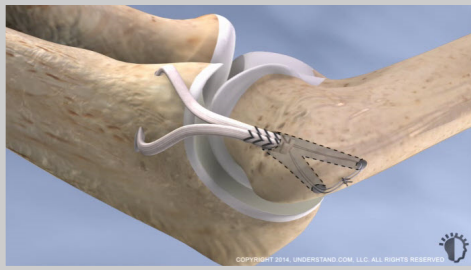
Preparation

Prior to the procedure, you will be positioned on your back with your body supported and the arm draped and positioned for surgery. You will be given medications such as a nerve block or general anesthesia to prevent the sensation of pain. The arm will be compressed and elevated to remove blood, and a tourniquet is placed to temporarily limit blood flow to the region during the surgical procedure. UCL reconstruction is typically an outpatient procedure where you will be permitted to return home after surgery, which averages around 1.5 hours, but varies based on surgical technique and how tendon used to replace the ligament is obtained. Arthroscopy, in which a small camera is used to see inside the joint, may also be performed before making a larger incision for the procedure in order to look for other problems in the joint that can be addressed during surgery.



Graft Harvest

A tendon will be used to replace the damaged anterior collateral ligament, so it must be harvested and prepared for the procedure. This tendon is usually obtained from you, called an autograft, and less commonly it may come from a cadaver, called an allograft. Most frequently the palmaris longus tendon from the wrist and forearm region on the same side as the injured elbow is used. This tendon can be removed without impacting hand or wrist function and is frequently used as a graft for a variety of procedures. However, some people lack this tendon or there may be a need to use an alternate such as a portion of another forearm tendon, a tendon from the knee or hamstring, a big-toe tendon, or part of the Achilles tendon at the back of the ankle. Small incisions are made to remove enough tendon for the six to seven inches, 15-18 cm, needed for the reconstruction. The tendon tissue is then cleaned and prepared for the reconstruction procedure.



Procedure

The reconstruction procedure starts with an approximately 3 inch (about 7-8 cm) skin incision, centered over the UCL on the inside of the elbow. As soft tissue is dissected, nearby nerves are identified and held out of the way. Once the muscle layer is reached, an incision that splits the flexor muscles is made and they are held apart with retractor devices. Older variations of this procedure would detach the muscles and reattach them later, but today this is often unnecessary. Beneath muscle lies the UCL and joint capsule. The ulnar collateral ligament is split in line with the fibers to access the joint.

At this point, surgical variations exist, and new approaches are under study; however they are generally variations of the traditional and most common approach, in which bone tunnels are created to accept the tendon graft. Two holes that form a tunnel are created in the ulna, and two tunnels that meet in the middle, forming a Y-shape are created in the humerus. Next suture material or small wires used to thread the graft through the tunnels are positioned. The tendon graft is pulled through the ulna and the ends of the graft are directed toward the lower hole in the humerus. In what is called the figure 8 method, the tendon graft is threaded through the holes in the humerus and then sutured back onto itself, creating a continuous loop in a figure 8 pattern. In a variation known as the docking method, the free ends of the tendon graft are passed through the lower hole in the humerus and pulled taught through the holes on either side of the epicondyle. Next, strong, permanent suture material is used to form a bridge across the bone and dock free end of the tendon graft in bone.

Some surgical variations use fewer tunnels and buttons as anchors or screws that wedge the tendon graft in place.

Portions of the tendon may be sutured together for strength, and remaining UCL is repaired and may be sutured to the tendon graft



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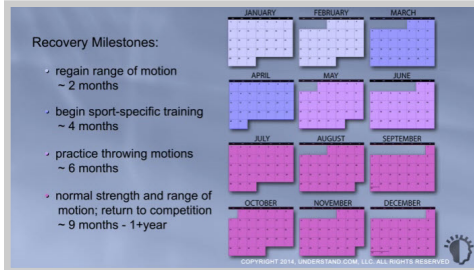


remaining UCL is repaired and may be sutured to the tendon graft for additional support.

If the ulnar nerve was damaged with the UCL, it may be rerouted from the cubital tunnel to the inside of the elbow joint to avoid stretching the nerve when the arm flexes.

After the repair is tested for strength and stability, the muscles and skin are closed. A dressing and bandage will be applied to complete the procedure.

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Recovery and Results

You will typically have your arm immobilized with a splint for about 10 days. If non-absorbable sutures are used for the skin incision they will be removed at about the time the splint comes off. You may be requested to wear a special brace that is hinged at the elbow to protect the repair while you recover. Physical therapy starts as soon as feasible. Many patients are able to regain their range of motion within two months and can begin careful, sport-specific strength training at around four months. At around the six month mark, athletes may be permitted to practice throwing motions with continued elbow and shoulder strength training. Full, pain-free rehabilitation with normal strength and range of motion, where one can return to competition usually takes nine months to a year or more.

Ulnar Collateral Ligament reconstruction, Tommy John surgery, has a high success rate and some patients actually improve performance. Possible gains in performance are believed to result from strengthening exercises and a better understanding of throwing mechanics after physical therapy as well as restoring stability to formerly unstable elbow joint. UCL reconstruction converts a tendon into a functioning ligament, and the majority of patients can return to normal activity and previous levels of competition.