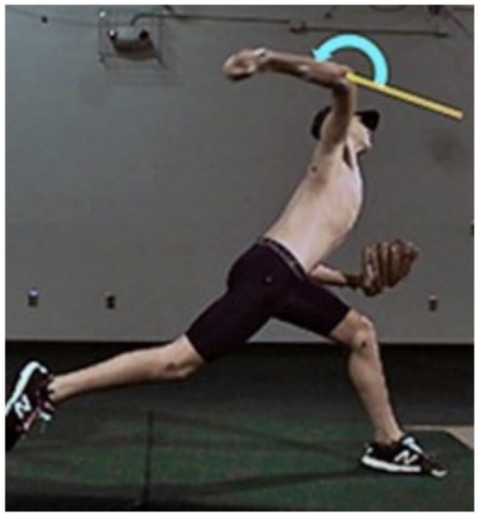
Innovation Spotlight

Dr. Chudik's Tunnellness UCL Surgery
Sparing Bone, Restoring Hope

Ulnar collateral ligament sprains are tears of the ligament on the inner side of the elbow. The ulnar collateral ligament (UCL) is a structure that helps maintain the normal relationship of the humerus (upper arm bone) and the ulna (one of the forearm bones). This ligament can be injured in throwing activities or after elbow dislocations. It could happen as a sudden tear or gradually stretch with time and repetitive stress. This ligament is rarely injured in daily activities.



In the late cocking and early acceleration phases of an overhand pitch, the medial elbow endures as much as 64 Nm valgus, with the elbow in 90 to 100 degrees of flexion where the UCL is the most critical stabilizer.

For throwers, the UCL is the most vulnerable to injury during the late cocking and early acceleration phases of an overhand pitch because the medial elbow endures most of the force, as much as 64 Nm valgus, with the elbow in 90 to 100 degrees of flexion where the UCL is the most critical stabilizer. According to researchers, the mean maximum load to failure for a native UCL is 34.29 Nm and for a reconstructed UCL 30.55 Nm in the late cocking stage—or enough stress with every pitch in the late cocking phase to cause a UCL tear. Other sports with overhead motions, such as throwing a football, hitting a volleyball or tennis serve do not have the same mechanics and don't cause the same injuries as a baseball pitch.

The UCL can be torn after a single throw or stretched out over time from chronic overloading. When torn, the UCL usually does not heal or may heal in a lengthened position (loose). Surgery usually is indicated for people who wish to return to throwing and are having persistent pain and symptoms with a torn or incompetent UCL tear and have failed nonoperative options. Researchers report player return to sport rates with nonoperative treatments are less than 42 percent compared to 97 percent with only a 6.7 percent failure rate when surgery was performed.

The initial reconstruction of the UCL in athletes was reported in the Journal of Bone and Joint Surgery in 1986. It involved lifting the flexor muscles and drilling two holes in the ulna and three holes in the medial epicondyle to recreate the attachment point of the native UCL. The surgeon then passed a donor tendon making a figure eight and attached the two ends together. With this technique, more than 60 percent of elite throwing athletes returned to sport at their preinjury level. Since the creation of this initial technique, it has undergone many modifications. The main technique difference involves the treatment of the ulnar nerve, graft configuration and how the graft is attached. No studies have shown a clear benefit of one technique over another. All techniques involve drilling tunnels in the bones to fix the UCL graft in place.

Continued on next page

Dr. Chudik's Tunnellness UCL Surgery
Continued

Dr. Chudik performs this surgery through one main limited incision on the inside of the elbow. Depending on the case, he also may arthroscopically inspect the elbow joint using a small camera. Typically, the original ligament is stretched out or torn and not repairable, so a tendon graft is needed to reconstruct the UCL. There are some patients that may benefit from a repair. For the reconstruction, a tendon usually is taken from the forearm or the knee through a small incision to make a new UCL. The primary difference with Dr. Chudik's surgical procedure is he does not drill large holes in the ulna (forearm bone) and the humerus (upper arm bone) to attach the new ligament graft.

MRI image of right elbow UCL tear

Instead, Dr. Chudik developed a technique that avoids drilling large holes/tunnels into the bone. He reattaches the UCL graft to the surface of the bone, restoring the correct anatomic position of the UCL and avoids the risk of fracture to the bone because of the bone tunnels. Return to sport with his procedure is excellent.

According to Dr. Chudik, using his technique keeps the bone strong and better able to endure the forces placed on the elbow when a thrower returns to sport. Return to sport for either procedure is the same. Heavy lifting requires a minimum of four to six months and overhead throwing and hitting sports requires nine months to one year recovery that includes completing a throwing program in addition to physical therapy.

One growing concern for orthopaedic surgeons is the increase in the number of high school pitchers with UCL injuries. Researchers noted an 11-fold increase in UCL reconstruction performed on high school pitchers between 1988 and 2003. Also, "there is a common myth that throwers' elbows are stronger after having a UCL reconstruction than they were prior to injury," Dr. Chudik said. "This is not true. Literature shows pitchers can return to their sport, but may not always achieve the same velocity and force with throwing after the injury and surgery. Prevention of an injury is always better," he added. "

Recovery time for nonoperative and operative treatment is significant with a gradual return to throwing. Nonoperative treatment requires a lengthy recovery, physical therapy and return to throwing protocols dependent upon the player position. According to Dr. Chudik, heavy lifting requires a minimum of four to six month's recovery after surgery and overhead throwing and hitting sports require nine months to one year recovery time.