

# Modern Surgical Concepts for Ligamentous Reconstruction of the Elbow

Ligaments of the elbow are tough and are built to last. But repetitive overuse as in the case of the overhead throwing athlete can lead to ligament damage and elbow instability. Chronic load and stress create wear and tear on the ulnar collateral ligament (UCL) in particular.

In this article, surgeons at the Hospital for Special Surgery in New York City provide us with a complete review of ligamentous reconstruction of the UCL in throwing athletes. They begin with a brief history of this type of injury. Concepts around ligamentous reconstruction are presented along with a discussion of important anatomy and biomechanics needed to understand and the mechanisms of injury. Treatment including nonoperative management and current surgical techniques are presented.

Baseball is usually the first sport that comes to mind when we hear the term "overhead throwing athlete." But, in fact, the first throwing injury reported and described was a javelin thrower back in 1946. It wasn't until almost 30 years later that a surgeon (Dr. Frank Jobe) developed the first surgical technique to address this problem. Up until that time, a UCL injury in an overhead throwing athlete meant the end of a career.

Now, almost 40 years after that first procedure, there are several different ways to surgically reconstruct the elbow. Each approach requires consideration of the six stages of the overhead throw and all the mechanics required from start to finish. Load on the soft tissue connections is a key feature in understanding what is needed to fully restore the integrity of the ulnar collateral ligament.

Nonoperative management is possible for some throwing athletes, especially those who have an acute traumatic injury (as opposed to chronic wearing of the ligament). They must follow a carefully prescribed rehabilitation process but can get back into participation again. Newer treatment involving blood injection therapy (called platelet-rich plasma) is being investigated.

When it comes to surgical approaches to UCL injuries, the surgeon must evaluate each athlete individually to determine if repair or full reconstruction is needed. In the case of ligamentous repair, good-to-excellent results have been reported for young athletes with an acute tear of the ligament where it attaches to the bone.

UCL reconstruction is more likely required when there is an old, chronically strained tear in an older athlete. These athletes are often subject to repetitive overloading and experience elbow dislocation because of UCL disruption.

The original Jobe reconstruction used a tendon graft in a figure-eight pattern to replace the UCL ligament. Since that time, several modifications to the Jobe technique have been developed. These include the suture anchor method (called the hybrid technique), the interference screw (DANE TJ) technique, the docking technique, and the American Sports Medicine Institute (ASMI) technique.

The authors of this article describe the different reconstruction methods and review research results for each one. Drawings and intraoperative photos provide surgeons with an inside look at each of these surgical techniques. No one individual method is the "best" approach.

Research is ongoing to identify which athlete would respond best to which technique. There are multiple variables to consider including age, activity level and biomechanical stress on the joint, and complications. The most common complications of ligamentous reconstructive surgery include re-tear of the ligament, scarring and adhesions resulting in loss of elbow motion, and nerve damage.

Despite the potential for complications, the overall outlook for overhead throwing athletes with UCL damage is good. Ligamentous reconstructive surgery is well-developed and successful. Surgeons have adapted the original Jobe procedure to reduce muscle and nerve damage that occur with reconstructive techniques. Most athletes are able to return to full competitive participation equal to their preinjury status. This is a major advancement in the treatment of UCL injuries that was not possible just a few years ago.

Reference: Kristofer J. Jones, MD, et al. Ulnar Collateral Ligament Reconstruction in Throwing Athletes: A Review of Concepts. In *The Journal of Bone and Joint Surgery*. April 2012. Vol. 94A. No. 8. Pp. e49(1)-12.