J Shoulder Elbow Surg (2018) ■■, ■■–■■

ELSEVIER

Journal of Shoulder and Elbow Surgery

www.elsevier.com/locate/ymse

CASE REPORTS

An acute ulnar collateral ligament tear in a professional baseball player while batting requiring ulnar collateral ligament reconstruction

Brandon J. Erickson, MD*, Jonathan-James Eno, MD, Ryan A. Mlynarek, MD, David W. Altchek, MD

Division of Sports and Shoulder, Hospital for Special Surgery, New York, NY, USA

Keywords: Ulnar collateral ligament (UCL); ulnar collateral ligament reconstruction (UCLR); Tommy John; Major League Baseball (MLB); elbow; surgery

Ulnar collateral ligament (UCL) injuries have become extremely common in baseball pitchers of all levels.[3-5] Although injuries to the UCL can occur from 1 traumatic throwing or contact event, these injuries more commonly occur from cumulative microtrauma due to stress placed across the elbow during the overhand pitch.[6,9] As the stress across the elbow with pitching is tremendous, baseball pitchers are the most common group of individuals who sustain UCL injuries, although there have been reports of position players who have sustained UCL tears while throwing or diving and/or sliding.[4] While the amount of literature regarding treatment of UCL tears has increased over the past 10 years, there have been no reports in the literature of a UCL tear occurring in a hitter from a single baseball swing. This report is the first case of a professional baseball player who sustained a UCL tear to his nonthrowing elbow while hitting.

Case report

The patient is a 23-year-old right hand–dominant professional Minor League Baseball player who presented to our office following an injury to his left elbow received while batting. He is a third baseman who has been playing at the professional level for 3 years. The patient throws right handed but hits left handed (hence his left hand is his top hand when he is gripping a baseball bat). The injury occurred during a game when the player was taking a swing and had the immediate onset of left medial elbow pain and swelling (nonthrowing elbow). He was unable to continue batting and was removed from the game. He attempted an adequate trial of rest and rehabilitation but was unable to return to hitting because of medial elbow pain. Throughout his course, he was able to throw without difficulty, given that his right arm remained uninjured. He was referred to our office for further evaluation. On questioning, he denied any prodromal symptoms prior to this injury.

On examination, the patient was a well-appearing, fit man. There was no evidence of bruising or swelling about the left elbow. He had full, painless passive and active range of motion (ROM) of the left elbow and forearm. No strength deficit was present. He had increased laxity of the left medial elbow, a positive milking maneuver, and a positive moving valgus stress test. His left ulnar nerve did not subluxate, and he denied any ulnar nerve symptoms (no numbness or tingling in his fingers at rest or with hitting). The findings of the rest of the examination were unremarkable. Radiographs of the elbow showed normal findings without evidence of calcifications within the UCL. A magnetic resonance image was obtained and demonstrated an acute, full-thickness tear of the UCL (Fig. 1).

As a reasonable trial of nonoperative management had failed and the patient was unable to return to batting, an ulnar collateral ligament reconstruction (UCLR) was recommended to alleviate his pain with the goal of returning him to professional baseball. The patient and team concurred. A successful UCLR using the docking technique without ulnar nerve transposition

*Reprint requests: Brandon J. Erickson, MD, Hospital for Special Surgery, 535 E 70th St, New York, NY 10021, USA.

E-mail address: brandon.j.erickson@gmail.com (B.J. Erickson).

1058-2746/$ - see front matter
https://doi.org/10.1016/j.jse.2018.05.040

Figure 1 (**A-C**) Coronal magnetic resonance images of left elbow demonstrating full-thickness tear of ulnar collateral ligament without injury to flexor-pronator mass.

was performed with an ipsilateral palmaris longus autograft. The patient was placed into a splint postoperatively to allow the incision to heal and to protect the new tendon graft. This was transitioned to a hinged elbow brace, and he was gradually allowed to start to regain his elbow ROM. The rehabilitation protocol for the player in this case report was as follows: He began ROM exercises at 10 days, which he progressed to full over a period of 6 weeks. Once he achieved full ROM, he began strengthening at 6 weeks, and by 10 weeks, he was allowed to perform total body conditioning. He began a 3-month-long hitting progression program at 5 months, alternating days of rest with days of hitting (Fig. 2). The player was instructed that he would likely have at least 1 to 2 flare-ups during the hitting protocol. When a flare-up does occur, players should have an extra day of rest and may need to be backed down on the intensity of what they are doing. Our patient successfully returned to hitting at 8 months following his UCLR.

Final follow-up at 9 months demonstrated a stable elbow with full ROM and no positive provocative maneuvers on examination. The patient successfully returned to his preoperative level of play in the Minor League (he was 6 games into his first season back at the time of this follow-up) and had no issues with fielding or hitting at his last follow-up. His batting average in the 2 years prior to his injury was .256 and .255, and this year, following his return, it was .235. His slugging average in the 2 years prior to his injury was .372 and .447, while this year, following his return, it was .471. Hence, although he is only part of the way through his season, he is on par with his performance in prior seasons.

Discussion

UCL tears have become common injuries among baseball pitchers of all levels.[3,5] While the injury can stem from an acute traumatic event, it is commonly an attritional rupture. This is the first report in the literature of an acute UCL tear sustained while batting. While the number of UCL tears in baseball players, specifically pitchers, has dramatically increased over the past several years, no report of a UCL tear sustained while batting has been recorded in the literature.[4]

The UCL, which runs from the medial epicondyle to the sublime tubercle, is the primary soft-tissue restraint to valgus stress across the elbow.[10] The UCL is composed of 3 separate bundles—anterior (which is made up of the anterior and posterior bands), posterior, and transverse (which does not cross the elbow and therefore does not resist any valgus stress)—and has an average length of 4.7-5.4 cm.[7,11,12] Along with the flexor-pronator mass and the bony congruity of the elbow joint, these structures resist the approximate 64 Nm of force experienced by the medial elbow during the late cocking–early acceleration phase of the overhead baseball pitch.[8] As the average ultimate failure moment is 34.29 Nm for a native UCL and 30.55 Nm for a reconstructed UCL, the stress placed on the UCL during the late cocking phase of every pitch is more than enough to cause a UCL tear.[1,10] Without the bony and other soft-tissue restraints, the UCL would tear with every pitch.

While a great deal of research has gone into understanding the amount of stress placed across the elbow with the baseball pitch, no studies have evaluated the amount of stress placed on the elbow, specifically the UCL, during the baseball swing. The lack of knowledge surrounding the elbow during a baseball swing likely stems from the fact that, until now, no reports of UCL tears sustained from batting existed. However, this is something that needs further investigation because although the majority of professional baseball pitchers bat infrequently, adolescent, high school, and college pitchers bat on a regular basis. Because the number of UCL injuries in pitchers of all levels is on the rise, it is critical to