

Increased Valgus Carrying Angle and Ulnar Neuritis in a High School Baseball Player

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Abstract

Athlete is a 187 cm, 79 kg, 17 year-old male high school baseball pitcher. Athlete's prior medical history revealed no prior injury or surgeries. Athlete reported to physical therapy following doctor evaluation and MRI complaining of general elbow pain radiating down the medial forearm. Athlete denied any specific mechanism, reports pitching for high school team and competitive travel team in the offseason. Initial evaluation revealed increased valgus carrying angle of the right elbow with point tenderness near medial epicondyle. The athlete has full active shoulder ROM with increased external rotation and decreased internal rotation. Elbow ROM is within normal limits. Orthopedic Clinical Exam Included: Tinels sign (+) Elbow Valgus Stress test (+) **Differential Diagnoses:** Medial Epicondylitis, Ulnar Collateral Ligament sprain, Ulnar nerve pathology. MRI revealed increased valgus carrying angle with ulnar neuritis, no UCL injury.

Introduction

The following is a case study of a male high school pitcher who reported to physical therapy complaining of intense, burning pain along the medial aspect of the right elbow. Although baseball is considered a safe sport, young pitchers often experience arm injuries, especially at the elbow joint. Microtrauma to soft tissues occurs at the joint due to the forceful nature of the pitching motion, and repetitive stresses can cause these microtears to accumulate and become more serious injuries (Preston, Mason, & House, 2009). Several risk factors have been pre-determined to have effects on the elbow; these include arm fatigue, pitch count, and type of pitch. Repetitive overhead throwing results in high valgus and extension forces to the athlete's elbow, which typically leads to injury or progressive structural change. During the pitching motion, a tensile force is placed on the medial stabilizing structures with compression of the lateral side and a shear force on the posterior aspect (Cain, Dugas, Wolf, 2003).

Clinical Evaluation

Athlete was a 187 cm, 79 kg, 17 year-old male high school baseball pitcher. Athlete's prior medical history revealed no prior injury or surgeries. Athlete reported to physical therapy following doctor evaluation and MRI complaining of general elbow pain radiating down the medial forearm. Athlete denied any specific mechanism, reported pitching for a high school team and competitive travel team in the offseason. Initial evaluation revealed increased valgus carrying angle of the right elbow with point tenderness near medial epicondyle. The athlete had full active shoulder ROM with increased external rotation and decreased internal rotation. Elbow ROM is within normal limits. Orthopedic Clinical Exam Included: Tinels sign (+) Elbow Valgus Stress test (+). MRI ordered and revealed increased valgus carrying angle with ulnar neuritis, no UCL injury.

Differential Diagnosis

- Medial Epicondylitis
- Ulnar Collateral Ligament sprain
- Ulnar nerve pathology



Treatment

This athlete began physical therapy, starting at three sessions per week, for 12 weeks. Upon arrival, therapeutic thermal ultrasound was administered along medial aspect of forearm, to the forearm flexor origin along the medial epicondyle. The athlete then began a therapeutic exercise program incorporating progressive isotonic exercises with dumbbells, pulleys, and elastic bands. Isotonic exercises of the upper extremity targeted the forearm, upper arm, and shoulder girdle musculature. The entire upper extremity was addressed, with stress placed on the wrist flexors, shoulder external rotators, and scapular stabilizers. In training the athlete, proper biomechanics of the pitching motion was stressed by encouraging more active motion, particularly external rotation of the shoulder, as opposed to increased motion occurring at the elbow.

Implications

One domain of athletic training is treatment and rehabilitation. This case highlighted the conservative approach to the treatment and rehabilitation for a high school baseball pitcher with elbow pain. Evaluation of the shoulder is crucial when dealing with the elbow joint. A study conducted in 2012 found that Little League pitchers that participated in travel ball and a higher proportion of games were more susceptible to shoulder pain. According to this study, pitching with a prior history of shoulder pain and tiredness were more likely to face reoccurring shoulder problems later in life (Mihalik, Oyama, Mueller, 2012). Per the study, statistics show that 40 percent of high school pitchers, and 20 percent of Little League pitchers surveyed suffered from shoulder pain. These relatively high rates of occurrence are alarming in the Little League population due to immature skeletal structure that can increase the likelihood of a growth plate injury. The rapid development of the musculoskeletal system throughout the youth period allows for greater velocities to be reached while pitching, increasing the demand of the soft tissues to stabilize the joint. When the shoulder becomes fatigued due to excessive pitching, the athlete will usually compensate by increasing the torque at the elbow joint, compromising the integrity of these tissues.

Conclusion

This case highlighted the conservative treatment of an athlete who suffered from ulnar neuritis in his right elbow due to structural abnormalities acquired through repetitive pitching. As athletic trainers in a rehabilitative setting, cases like this may present themselves in a variety of overhead throwing sports. It is important to have a thorough understanding of the biomechanics of throwing when developing a rehabilitation plan. According to the literature, a non-invasive treatment program should be implemented when a case like this presents itself. Initially, the treatment program should be tailored to reducing pain and inflammation. A period of rest coupled with NSAID's should be administered. Those athletes with partial tears or with symptoms secondary to medial epicondylitis or ulnar nerve pathology should be treated conservatively with activity moderation and an upper extremity strengthening program.

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