Excellence in Research and Education

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LITTLE LEAGUE SHOULDER

Background
Little League shoulder is a common overuse injury associated with baseball. The condition occurs most often in pitchers, but also occurs in position players who throw frequently. It is occasionally seen in tennis players and football quarterbacks.

The condition results from repetitive “microtrauma” caused by the large rotational forces needed to throw at high speed. The injury occurs at the growth plate of the upper arm bone (humerus). This is due to the relative weakness of the growth plate as compared to the other structures, such as the bone, muscle, or tendon.

Symptoms
Most patients complain of pain in the upper or middle portions of the arm (near the shoulder). The pain may also radiate to near the elbow. It typically has an aching quality, and usually is brought on by throwing, and improves with rest or avoidance of the activity. Most patients develop symptoms gradually over time. It is more unusual to develop pain suddenly with a specific throw or event. Most athletes do not have complaints that last more than one to a few days after throwing.

Age
The condition is most often seen in throwing athletes between the age of 11 and 16. Most adolescents are undergoing rapid growth during this time, which makes them more susceptible to the condition. This coincides with the time many of these athletes are developing new pitching skills and techniques, and are increasing their time involved in the sport.

Anatomy
The proximal humerus growth plate appears at 6 months of age, and typically closes (or fuses) between 19 and 22 years of age. It is responsible for 80% of the growth in length of the humerus (arm bone).

High-level baseball pitchers develop changes in the ability to rotate their throwing arm relative to their non-throwing arm. It is believed this change is due to remodeling or adaptation of the upper arm bone through the growth plate. While such changes may promote or allow higher level performance, it does not allow unlimited throwing or activity while the athlete is maturing (and the growth plate remains open).

Diagnosis
The young athlete first undergoes a standard physical examination of the posture, strength, mobility, and function of the neck, shoulder, elbow, wrist and hand. In addition, attention is paid to the development of the torso and legs. Particular attention is paid to the stability of the shoulder and elbow joints, the function of the rotator cuff, and the rotational movement of the shoulder.

Xray evaluation is helpful to confirm the diagnosis, but depending upon the individual presentation, they may or may not demonstrate changes. Comparison xrays of the non-throwing shoulder are typically helpful.

The xray finding most consistent with the condition is widening of the growth plate in the throwing shoulder.

Other imaging tests, such as CT scans, MRIs, or bone scans rarely provide additional information, and are usually unnecessary.

Treatment
The treatment of Little League shoulder is nonsurgical. Rest is the most critical and necessary component of treatment. This means strict avoidance of the activity which produces symptoms. There is no consensus on the length of rest period required. Brief use of an anti-inflammatory medication, such as Ibuprofen, can be helpful. Icing after activity may also be beneficial. It is important that the athlete undergo a physical therapy program during the rest period to maintain and/or improve the functional strength of the shoulder. This program is comprehensive. In addition to conditioning the shoulder, attention is also paid to conditioning of the torso and lower body, as well as the forearm and elbow. Stretching exercises are also recommended which can improve the balance and flexibility of the shoulder.

It is most productive to have the athlete work with a therapist who has particular interest and experience in treating overhead athletes. The exercise program can often be performed in conjunction with an athletic trainer, or independently, once appropriate instruction is provided.

Return to sport
There is no specific time frame for return to sport. The progression through therapy and resuming sport specific exercises is individual to each athlete. In general, the athlete may resume activity when full strength, range of movement, and absence of symptoms is demonstrated. The decision to return is not based on other findings, such as xrays.

When these criteria are met, the athlete begins a functional throwing progression under the supervision of the physical therapist or athletic trainer, as mentioned above. In addition, the evaluation of the athlete's sport specific mechanics is

often desirable, and may be done by a specific coach or other professional with experience in the field.

The throwing progression is carefully planned out, and gradually increases the number, type, distance, and speed of throws. It is very important to watch closely for any soreness or return of symptoms. If symptoms re-develop, then decreasing the intensity of the workouts, or repeating a rest period may be required.

Outcome

Little league shoulder is generally a self-limited condition, which means it ultimately resolves with appropriate treatment and time. Athletes without treatment may rarely go on to develop more significant injury. Permanent loss of performance (difficulty with throwing speed or accuracy) is also possible, but infrequent.