Little Leaguer’s elbow and Little Leaguer’s shoulder are overuse pathologies seen in overhead-throwing athletes. No instance of simultaneously occurring pathologies has been published. A 15-year-old baseball pitcher and football quarterback developed pain in his throwing shoulder and elbow during spring baseball, which partially resolved with several months of rest. During fall football practice, he felt a pop and pain over his medial throwing elbow. Five days after the initial injury, medial elbow tenderness, mild swelling, and decreased range of motion were noted. Radiographs revealed a Salter I avulsion fracture of the medial humeral epicondyle (Little Leaguer’s elbow) and a periosteal reaction along the lateral aspect of the humeral metadiaphysis with slight widening (Little Leaguer’s shoulder). Surgical fixation of the medial epicondyle fracture and nonoperative treatment of the shoulder pathology were performed. Two-year follow-up radiographs showed a healed medial epicondylar fracture and resolution of the periosteal reaction of the humeral metadiaphysis. The patient returned to full activity and was starting quarterback for his football team. Biomechanical forces specific to overhead-throwing activities are associated with the development of Little Leaguer’s elbow and shoulder. Treatments of both pathologies remain controversial, with either initial operative vs nonoperative care. In this patient, a good outcome was achieved with surgical fixation of the elbow fracture and conservative management of the shoulder pathology. Educating coaches and parents on proper throwing technique and pitching limits should be the first step in reducing the occurrence of either pathology in this population.

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Lesions of the epiphyseal cartilage of the proximal humerus (Little Leaguer’s shoulder) and of the medial apophysis of the elbow (Little Leaguer’s elbow) in youth throwers were first described >50 years ago by Brogdon and Crow and Dotter. Both conditions are associated with overuse and excessive biomechanical forces placed on the arm during the throwing phases. Current treatment of both conditions consists of prolonged rest with or without surgical fixation. In most cases, a full return to prior activity is obtainable under proper supervision and coaching. A search of the PubMed database from 1946 to current day with the key word combinations of Little Leaguer, shoulder, elbow, and apophysitis revealed no reports of these injuries occurring simultaneously.

CASE REPORT

A 15-year-old right-hand-dominant baseball pitcher and football quarterback developed pain in his throwing shoulder and elbow during the spring and summer pitching seasons. Over the summer, he received care from several physical therapists and coaches who advised him to decrease the amount of throwing and begin a home stretching regimen. The pain decreased following several months of rest and stretching. He resumed throwing but noticed a return of pain in his elbow.

While throwing at football practice in the fall, he felt a pop in his right elbow, followed by immediate severe pain and swelling over the medial aspect of his elbow. Rest, ice, and ibuprofen slightly decreased the pain. He presented to the sports medicine clinic 5 days after injury with severe pain and limited range of motion (ROM) in the elbow.

Physical examination at this time revealed guarding with a flexed elbow and internally rotated shoulder. Mild swelling was present over the posteromedial elbow. No ecchymosis was noted, but tenderness to palpation was appreciated over the medial epicondyle of the humerus and anterolateral shoulder. The shoulder demonstrated full ROM without pain, but the elbow’s passive ROM was limited to 45° to 100°. Pronation and supination remained fully intact. Full assessment of valgus and varus stress tests was not possible due to pain, but a subjective increase in valgus gapping was noted compared with the contralateral side. The extremity was otherwise unremarkable and neurologically intact.

Plain radiography revealed a Salter I avulsion fracture of the medial humeral epicondyle with widening of 5 mm of the physis. Imaging of the right shoulder showed a mild smooth periosteal reaction along the lateral aspect of the humeral metaphysis just distal to the physis compared with the contralateral side. Imaging of the right shoulder showed a mild smooth periosteal reaction along the lateral aspect of the humeral metaphysis just distal to the physis compared with the contralateral side. Imaging of the right shoulder showed a mild smooth periosteal reaction along the lateral aspect of the humeral metaphysis just distal to the physis compared with the contralateral side. Imaging of the right shoulder showed a mild smooth periosteal reaction along the lateral aspect of the humeral metaphysis just distal to the physis compared with the contralateral side.

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tive assisted ROM exercises emphasizing flexion and extension while minimizing valgus load. Radiographs at 2 and 6 weeks postoperatively showed good positioning of the fragments and progressive healing. Strengthening exercises were started when he obtained full ROM at 6 weeks postoperatively. At 12 weeks postoperatively, throwing exercises under the guidance of a throwing coach were initiated. Follow-up 10 months postoperatively revealed no pain in the elbow, and radiographs showed fully ossified bone with good screw positioning. Radiographs of the shoulder showed an open growth plate with slight lateral widening, but this was improved from past examinations. The patient had full ROM and strength.

At 2-year follow-up, the incision was well healed, and the patient maintained full, pain-free shoulder and elbow ROM. Strength was equal to the unaffected side, and no neurological deficits were appreciated. Radiographs of the shoulder and elbow showed complete resolution of the periosteal reaction along the lateral aspect of the humeral metaphysis with no physeal widening and no physeal widening along the lateral aspect of the humeral metadiaphysis.

**DISCUSSION**

Little Leaguer’s elbow and Little Leaguer’s shoulder are conditions commonly found in isolation involving the humeral physes in skeletally immature patients subjected to repetitive motions such as overhead throwing. Clinically, Little Leaguer’s elbow commonly presents with acute or insidious onset of elbow dysfunction and pain over the medial epicondyle. Plain radiographs can show a physeal reaction or avulsion injury to the medial epicondyle of the elbow. Similarly, Little Leaguer’s shoulder presents with either an acute or insidious onset of pain located over the proximal humerus, especially during throwing. The etiology of Little Leaguer’s elbow involves the excessive valgus forces placed on the elbow during throwing. The medial epicondyle epiphysis of the elbow is usually the last ossification center of the elbow to fuse, at approximately age 15 or 16. Excessive forces can lead to a traction apophysitis, physeal growth alterations, and eventual osteochondritis dissecans of the medial humeral epicondyke.

Adolescent male pitchers commonly develop Little Leaguer’s elbow due to excessive hard throwing. It can also be observed in field players and is not exclusive to baseball. In a radiographic study of 343 Little Leaguers with a mean age of 11.6 years (range, 9.5-12 years) and mean time of participation of 2.5 years (range, 1.2-3.4 years), Hang et al found that 63% of pitchers, 70% of catchers, and 50% of fielders had >1 mm of separation between the medial epicondyle and the ossified humeral metaphysis. Of the players with separation, 49% reported a history of symptoms in that season. Further, true fragmentation of the medial epicondyle was found in 19% of pitchers, 40% of catchers, and 15% of fielders. The rates of overall separation (57%) and fragmentation (19%) found by Hang et al correlates with the seminal findings of Adams in 1965.

Little Leaguer’s shoulder etiology is similar to Little Leaguer’s elbow in that excessive forces placed on the bone may disrupt the physeis. In an analysis of the biomechanics of youth baseball pitchers, Sabick et al described how the external rotational torque acting about the humerus can lead to cartilage deformation and the development of proximal humeral epiphysiodesis.

Management of Little Leaguer’s shoulder and Little Leaguer’s elbow initially focuses on conservative treatment.
In a review of 23 reported cases of Little Leaguer’s shoulder, discontinuation of any throwing for an average of 3 months (range, 1-12 months) was found to be sufficient for healing. Return to throwing activity was allowed based on the absence of symptoms. Ninety-one percent (21/23) of patients returned to playing baseball and had no further symptoms. One pitcher, diagnosed at age 11, demonstrated premature closure of his proximal humeral physeal shaft by age 15. However, he continued to throw asymptomatically for 2 years without further clinical problems, including limb-length discrepancy. Physical therapy was not routinely used in the cases described. The authors reported that several patients who underwent a strengthening program during their rest period developed worsening pain. 

Acute management of Little Leaguer’s elbow related to surgical intervention remains controversial. Whereas conservative treatment is appropriate for fractures with minimal displacement, open reduction with internal fixation and nonoperative treatment in a long-arm cast have been shown to be effective in patients with medial epicondyle fractures displaced >5 mm. Factors that might further indicate open reduction and internal fixation include instability, size or position of the fragment, and the level of participation of the athlete. In a review of the literature, Fleisig et al found that adolescents who pitch >85 pitches per game or pitch >8 months per year, or those with recurrent arm fatigue are more likely to require elbow surgery. Either way, early, active, and controlled ROM exercises beginning at weeks 1 to 2 are important to decrease stiffness. Return to throwing and sports-related activity is generally started at approximately 6 weeks or with radiographic evidence of fracture union.

Although treatments have been shown to result in good outcomes, with eventual return to full participation, prevention of both pathologies is critical. The USA Baseball Medical & Safety Committee has made recommendations for total pitch counts per game, week, season, and year for players between the ages of 9 and 14. From such recommendations, regulations to limit the number of pitches in a day and the amount of time off between pitching days have been established and supported by governing organizations, such as Little League Baseball and USA Baseball.

More adolescent baseball players are playing multiple seasons or for multiple teams at a time. This increased duration and intensity at a single sport increases the chance of sustaining a significant overuse injury. Educating athletes, parents, and coaches on safe amounts of pitching, adequate rest, and throwing-free periods is the most effective means of preventing such injuries. Improper return to play can result in overuse pain syndromes or avulsion fracture, as seen in our patient.

**CONCLUSION**

Little Leaguer’s shoulder and Little Leaguer’s elbow are overuse injuries that require carefully limited throwing volume for prevention and for returning to activity after an injury. Because each has an associated basis in skeletal immaturity paired with improper training and biomechanics, the education of parents and adolescent athletes regarding these factors is the cornerstone of management and prevention. Furthermore, given that the etiologic mechanism is common in both injuries, a thorough history and physical evaluation of both the elbow and shoulder of the affected arm should be performed when either injury is seemingly presented in isolation. Early detection and appropriate treatment of these injuries is ideal in preventing complications and allowing for a full return to prior activity.

**REFERENCES**