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Selected Topics: Sports Medicine

MISSED THROWER'S FRACTURE OF THE HUMERUS IN A PEDIATRIC ATHLETE: A CASE REPORT

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Abstract—Background: Humerus fractures caused by the throwing motion are extremely rare. They have been reported mostly in recreational adult athletes in their third or later decades of life. A pediatric thrower's fracture is even less common, with few reported cases. The pediatric version of this fracture is located in the proximal to midshaft humerus, distinguishing it from the adult type, which occurs in the middle to distal shaft. **Case Report:** A 12-year-old male pitcher experienced a “snap” in his right arm while throwing a pitch in a baseball game. He presented to the Emergency Department with right arm pain and deformity. He was misdiagnosed with a right glenohumeral dislocation and a reduction maneuver was attempted prior to any radiographic imaging. Upon further review of the imaging and outpatient follow-up, he was found to have a humeral spiral fracture consistent with a “ball-thrower's fracture.” The fracture healed with conservative treatment and he returned to unrestricted sports participation. **Why Should an Emergency Physician Be Aware of This?:** Recognition of this fracture is important to avoid unnecessary and potentially harmful treatment of the pediatric patient. A thrower's fracture of the pediatric humerus is rare, but glenohumeral dislocation without direct trauma is even less common and has never been reported as a result of the throwing motion in a pediatric patient. Radiographic imaging is important, and consideration of the thrower's fracture should be in the differential for any patient presenting with acute pain and deformity of the arm resulting from throwing any object. © 2018 Elsevier Inc. All rights reserved.

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INTRODUCTION

The majority of humeral fractures are the direct result of a traumatic event. In skeletally immature patients, humerus fractures most commonly occur at or near the physis (1–6). Humerus fractures associated with the throwing motion have been increasingly reported in the literature, and are usually found in adults, resulting from the actions required to throw or propel various objects (7–18). These fractures are suspected to be the product of applied torsional forces from muscular attachments on the humerus during the complex throwing motion (15,19–22). The resultant spiral-type humeral shaft fractures have been deemed “ball-thrower's fracture” or simply a “thrower's fracture” (8,10,11,13–15,17).

Humeral spiral shaft fractures are extremely uncommon in the pediatric and adolescent thrower (16,23–25). Injury to the growth centers of the humerus by repetitive forces are far more prevalent in the immature throwing athlete. This is likely due to the increased strength of bone, ligaments, and tendons compared with the relatively weaker epiphyseal growth plates. Humeral physeal injuries characterized by

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proximal humeral epiphysiolysis and medial epicondyle apophysitis are recognized to occur far more frequently and have been termed “Little League shoulder” and “Little League elbow,” respectively (21,26–29).

This report illustrates a unique case of a 12-year-old pitcher who sustained a proximal to midshaft spiral humerus fracture while pitching. The fracture was not recognized at initial presentation to the Emergency Department (ED). The goal of this report is to increase awareness of this uncommon fracture presentation in the pediatric athlete and also provide evaluation and management options to optimize diagnosis and treatment outcomes. To our knowledge, this is the youngest, single presentation in the literature of a nonpathologic humeral shaft fracture from throwing.

CASE REPORT

A 12-year-old right-hand-dominant boy presented to a local ED with acute right shoulder and arm pain that started while pitching in a baseball game. He described an audible “snap” and immediate pain during a pitch resulting in deformity of his right arm. Physical examination by the emergency physician raised a high level of suspicion for a right shoulder dislocation. The emergency physician performed a reduction maneuver of the patient’s shoulder prior to any imaging studies. Subsequent postreduction plain film radiographs of the right shoulder in the ED were reported to demonstrate a concentrically reduced glenohumeral joint without osseous abnormality or fracture (Figure 1). The patient was discharged with in-

structions to stay in a basic sling and follow up with an orthopedic surgeon.

The patient presented for outpatient follow-up 4 days later with continued pain in the right proximal humerus. History revealed a traumatic “snap” in the right upper extremity during a pitch, with pain described primarily over the deltoid region. Physical examination demonstrated a reduced glenohumeral joint with mild deformity of the right arm. Pain was elicited and crepitus was noted upon palpation of the proximal humerus. Neurovascular testing of the right upper extremity was intact. ED films were carefully reviewed and an area of concern for fracture on the radiographs, combined with the physical examination findings, prompted x-ray examination of the entire right humerus and shoulder. The imaging revealed a concentrically reduced glenohumeral joint with a proximal one-third to mid-shaft spiral diaphyseal humerus fracture (Figure 2). A pathologic lesion was not visualized on the plain film radiographs, but advanced imaging was ordered for further clarification. A simple sling was continued and the patient was instructed to follow up after a magnetic resonance imaging scan.

Magnetic resonance imaging of the right humerus did not reveal any pathologic lesions. The fracture characteristics and surrounding edema were noted, but uncomplicated by any other insidious process (Figure 3). Fracture alignment continued to be well maintained and further treatment consisted of immobilization in a coaptation splint. Radiographs at approximately 4 weeks from the date of injury demonstrated fracture callus with adequate alignment. Treatment with a Sarmiento

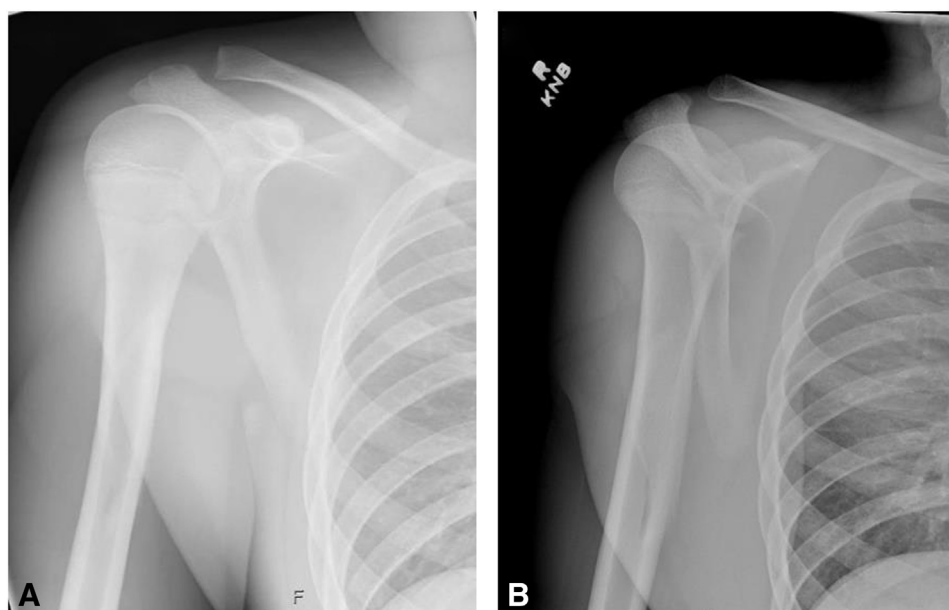


Figure 1. Anteroposterior (A) and scapular Y (B) shoulder radiographs obtained “post-reduction” during the patient’s initial visit to the Emergency Department. A concentrically reduced glenohumeral joint without osseous abnormality or fracture was reported, but careful evaluation at outpatient follow-up demonstrated linear and oblique lines concerning for a humeral shaft fracture.

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