

# Humeral Stress Fractures in Overhead Athletes: Pearls for Recognition, Diagnosis, and Management

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## Clinical Suspicion and Recognition

Clinicians must be aware of the potential for a stress fracture of the humerus when examining patients involved in repetitive overhead athletics with atraumatic arm pain in the mid to distal aspect of the upper arm (2). **Pearl:** The presentation may include insidious onset of increasing arm pain with throwing, arm fatigue, and/or aching after cessation of overhead activity which gradually increases over a period of weeks (2,5).

## Physical Examination

Physical examination signs include tenderness to palpation at the site of the stress. Shoulder and elbow range of motion is typically full but pain may be present at the ends of motion (4). **Pearl:** A “humeral squeeze test” in two planes (medial to lateral and anterior to posterior) may be performed to localize exact location of pain. Care should be taken to isolate the humerus as best as possible and avoid intervening soft tissue structures. This may require the examiner to be slightly off-axis when squeezing to avoid the biceps and triceps muscle bulk (Fig. 1).

## Imaging

Due to the low sensitivity for radiographs in stress fractures (Fig. 2), magnetic resonance imaging (MRI) may be necessary to identify early stress changes within bone (1) (Fig. 3).

## Treatment

Treatment includes non-weight-bearing of the affected upper extremity and cessation from all sport and exertional activity involving the upper extremity for 4 to 6 weeks.

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1537-890X/1506/384-385

*Current Sports Medicine Reports*

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**Figure 1:** Palpation of the distal humerus slightly off-axis with avoidance of the biceps and triceps muscle bulk.

Provided the patient is asymptomatic, a physical therapy program may be initiated, with a focus on restoration of motion, strength, and neuromuscular control for 6 wk



**Figure 2:** Anterior-posterior radiograph of right elbow. This radiograph was inconclusive for a metadiaphyseal stress injury.



**Figure 3:** MRI of the same (right) elbow as Figure 2. Coronal T2-weighted image. Notice the subtle edema pattern, circled in red, indicative of a potential distal humeral metadiaphyseal stress injury.

begins. If the patient continues to be asymptomatic, they may begin a sport specific program. **Pearl:** A throwing athlete is highly recommended to participate in a supervised gradual return to throwing program before competition to prevent injury recurrence (3,6). A typical program involves throwing on flat ground at shorter distances before

progressing to throwing off a mound (if a pitcher) with greater effort, volume of throws, and increased distances. Progression through each phase is contingent upon a thrower not experiencing any pain or discomfort during that respective phase (6).

### Conclusion

Physicians should consider humeral stress injuries to any athlete participating in overhead athletics with unexplained arm pain in the mid to distal aspect of the upper arm without a history of prior injury and pain on palpation.

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