Case 10662

Eurorad

Little Leaguer’s shoulder

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ISSN: 1563-4086
Section: Musculoskeletal system
Area of Interest: Musculoskeletal bone
Procedure: Diagnostic procedure
Procedure: Imaging sequences
Imaging Technique: Ultrasound
Imaging Technique: MR
Special Focus: Athletic injuries Case Type: Clinical Cases
Authors: Evangelos Perdikakis
Patient: 13 years, female

Clinical History:

A 13-year-old female elite butterfly-stroke swimmer, presented with a five-week right shoulder pain. The medical history revealed gradual onset of pain that worsened during training and excluded prompt return to sports activity. No recent or remote shoulder injury was reported.

Imaging Findings:

Physical examination revealed tenderness on palpation over the proximal humerus with no restriction in the range of motion. An MRI examination was performed that demonstrated subtle widening and oedema along the proximal humeral physis (Fig. 1). Correlation of the patient’s clinical history, the overhead sports activity, the physical examination and imaging findings suggested the diagnosis of Little Leaguer’s shoulder and she was instructed to rest and cease swimming. However, the athlete’s competitive nature resulted in non compliance with the treatment. She presented two months later with worse symptoms. Ultrasound and radiographs showed progression into a horizontal metaphyseal fracture (Fig. 2-3). Rest from overhead sports activities for an additional period of 3 months was advised. The athlete was asymptomatic at the end of the 3-month lay-off and was instructed to gradually resume activity over a one month period. She is currently pain-free and a gold medallist in her league.

Discussion:

Shoulder pain is a frequent problem among young athletes [1]. Little Leaguer’s shoulder represents an overuse-stress injury to the proximal humeral physis, that is seen commonly in adolescent athletes who participate in sports requiring overhead activity [1-2]. However, the true incidence of Little Leaguer’s shoulder is not known and has not been estimated so far [1-2]. Biomechanically the repetitive, excessive tractional and rotational forces across the open proximal humeral physis are thought to be the causative factors to this physeal stress fracture [1-3]. This injury was formerly known as proximal humeral epiphysiolysis, which is a misnomer since it is an overuse or stress injury of the proximal humeral growth plate and the adjacent metaphysis rather than an epiphyseal injury [1-3]. The typical clinical presentation is a patient (usually a male throwing athlete) between the ages of 13 and 16 years with complaint of gradual shoulder pain localised in the proximal humerus [1-3]. The pain is reported to be elicited and worsened during the overhead sports activity. Physical examination may show tenderness on palpation over the proximal humerus and may also reveal weakness in external rotation [1-3]. The diagnosis of Little Leaguer’s shoulder can be made on clinical grounds alone and imaging is rarely needed [1-4]. Nevertheless, when clinical history and physical examination are inconclusive musculoskeletal imaging can be a valuable tool for the referring orthopaedic or sports specialist [2-4]. The diagnostic radiographic signs have recently been published and include

physeal widening and lateral fragmentation or calcification, sclerosis, demineralisation and cystic change of the physis and the adjacent humeral metaphysis [2-4]. The characteristic MRI findings are physeal widening with bone marrow oedema along the physeal line [2-5]. Mild periosteal oedema and small subchondral cysts adjacent to the physis have also been described as additional MR features [2-5]. In our case, the patient's non compliance with the initial therapy resulted in a metaphyseal stress fracture and, to the best of our knowledge, this is the first report of such a complication in Little Leaguer's shoulder. Regarding treatment, conservative measures of rest and physical therapy are sufficient in Little Leaguer's shoulder [1-5]. It is of paramount importance that the athlete should be removed from the inciting sports activity until pain-free and then reintroduced gradually. In conclusion, close collaboration between the radiologist, sports physician, orthopaedic surgeon, physical therapist and the patient is mandatory for the correct management of this stress related shoulder injury.

Differential Diagnosis List: Little Leaguer's shoulder, Little Leaguer's shoulder, Shoulder impingement, Atraumatic multidirectional shoulder instability

Final Diagnosis: Little Leaguer's shoulder

References:

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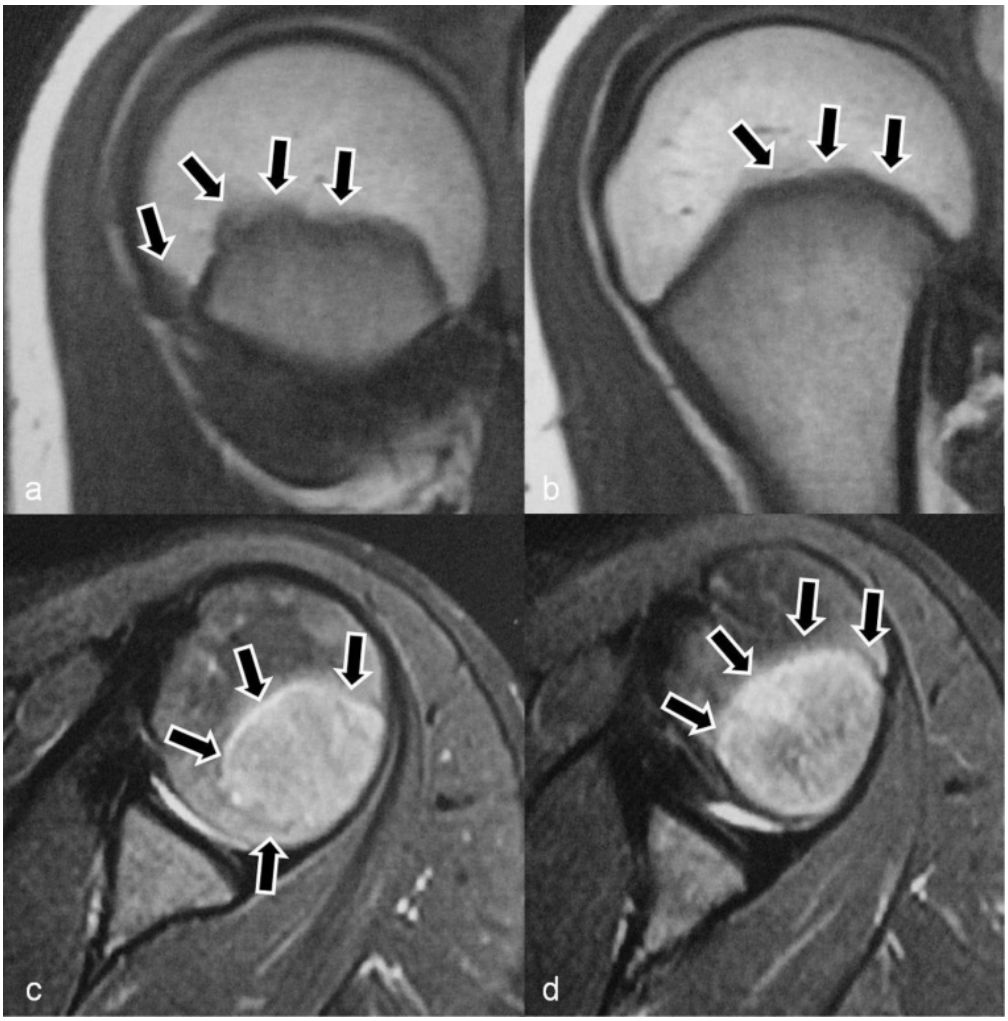
Figure 1

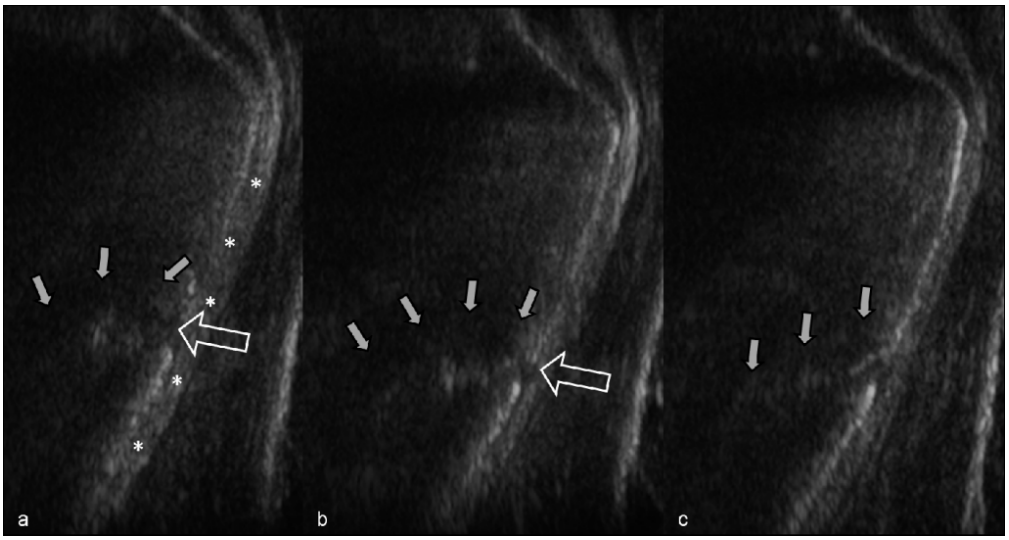
a



Description: The coronal oblique (a,b) T1w and the axial (c,d) fat saturated T2w MR images show subtle widening and oedema along the proximal humeral physis (arrows). **Origin:** 212 MASH-412 GMH

Figure 2

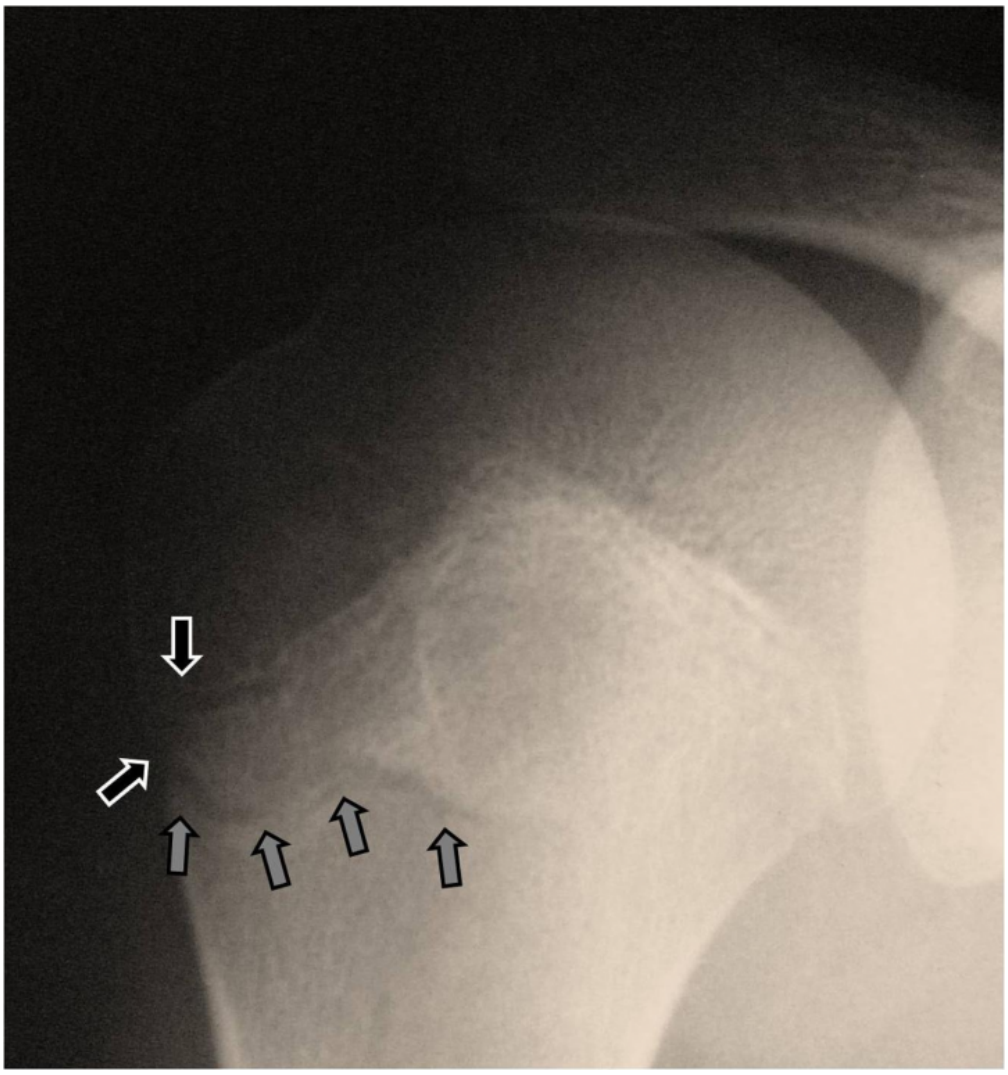
a



Description: The sequential (a to c) longitudinal ultrasound images show physeal widening (open arrow) and a metaphyseal fracture line (small arrows). Associated periosteal reaction is noted with asterisks. **Origin:** 212 MASH-412 GMH

Figure 3

a



Description: The external oblique right shoulder radiograph shows physeal widening and demineralisation (black arrows) and a metaphyseal stress fracture line (grey arrows). **Origin:** 212 MASH-412 GMH