

Calcific tendinitis of the supraspinatus tendon in a 7-year-old boy: diagnostic challenges

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This report is of a case of acute calcific tendinitis of supraspinatus tendon in a 7-year-old boy who presented to the hospital with an acute painful shoulder after a fall. Initial radiographs mimicked fracture of the greater tuberosity of the humerus. Subsequent investigation confirmed that the appearance was due to a calcific tendinitis. The patient recovered shortly afterwards with complete resolution of the calcific lesion.

Introduction

Calcific tendinitis of the supraspinatus tendon is one of the common causes of an acute painful shoulder in adults; accurate diagnosis is usually not a problem if a relevant history, physical examination, and radiographs are obtained. Its rarity in the paediatric group,¹⁻³ however, poses a diagnostic challenge.

Case report

A 7-year-old boy was admitted to our department through the Accident and Emergency Department (AED) in March 2010 with a diagnosis of fractured right greater tuberosity. He complained of severe right shoulder pain after a slip and fell injury in a shopping mall. On physical examination, he was afebrile, there was no external wound or bruise over the affected shoulder and its skin temperature was normal. On palpation, there was marked tenderness resulting in excruciating pain over the lateral part of his right shoulder near the tendinous insertion of the supraspinatus muscle. Both passive and active movements of his right shoulder were almost completely restricted due to the severe pain.

Anteroposterior (Fig 1a) and lateral (Fig 1b) radiographs of his right shoulder taken in AED showed a radio-opacity over the superolateral aspect of proximal humerus. The radio-opacity (Fig 1c) was irregular in shape, and had a homogenous radiographic density. It measured about 1 cm in diameter and had no obvious intralesional osseous trabeculation or cortical rim to suggest a bony origin. It was located in close proximity to the tendinous insertion of supraspinatus tendon. The radiographic appearance was much alike that of acute calcific tendinitis of supraspinatus tendon in adults.

On further history enquiry, the parents noted that the child did not complain of significant pain immediately after the so-called injury, at which time he could definitely use his right upper limb without much limitation, and the profound pain started only about 6 hours after the injury. Thus, as there was a significant time lag between the injury and the onset of pain, the diagnosis of acute fracture of the greater tuberosity became less likely.

Blood parameters included white cell count and C-reactive protein, which were ordered to exclude the possibility of acute pyogenic infection, but all results were within normal limits. The preliminary diagnosis of acute calcific tendinitis of supraspinatus tendon was made, although the age of the patient was not consistent with this possibility. The boy was treated symptomatically with simple analgesics.

Non-contrast magnetic resonance imaging (MRI) of his right shoulder was performed 2 days later, and showed an elongated T1 and T2 hypointense signal within the supraspinatus tendon just proximal to its insertion at greater tuberosity (Figs 1d and e). A calcific density measuring 1.03 cm x 0.41 cm x 0.90 cm in size was evident. The epiphysis was intact with no evidence of a bony fracture. A T2 hyperintense signal was noted in supraspinatus muscle and subdeltoid-subacromial soft tissue, suggestive of oedema. The MRI features were also suggestive of calcific tendinitis of the supraspinatus tendon.

Upon out-patient clinic follow-up after a week, the right shoulder pain had completely subsided and the range of shoulder motion was normal. Repeat anteroposterior radiographs of his right shoulder showed that the previous calcified lesion had disappeared (Fig 2).

Key words

Calcinosis; Shoulder joint; Tendinopathy

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Discussion

In general, the causes of acute painful shoulder can be classified into different categories according to the prevailing patho-anatomy. These include: (a) traumatic fractures and dislocations, (b) infective causes like acute pyogenic arthritis and osteomyelitis, (c) inflammatory causes like gouty arthritis, adhesive capsulitis or frozen shoulder and calcific tendinitis, (d) degenerative causes like rotator cuff tear, cervical spine radiculopathy and osteoarthritic glenohumeral joint, and (e) neoplastic causes like tumour metastasis. Sometimes the exact cause of the underlying pathology is obvious, but often it is not. For instance, a fall on an out-stretched upper limb in a young person may result in a deformed painful shoulder, whilst relevant radiographs may reveal a fracture with or without associated dislocation of the glenohumeral joint, for which further investigation may not be necessary. However, for a similar presentation in a middle-aged patient with a newly diagnosed malignancy who may be receiving chemotherapy or radiotherapy treatment, there could be many other diagnoses. Relevant radiographs may not reveal obvious bony metastasis in the shoulder region, but in any case the differential diagnoses should include:

一名七歲男童的棘上肌肌腱鈣化性肌腱炎： 診斷的挑戰

本文報告一宗有關棘上肌肌腱鈣化性肌腱炎的病例。患者為一名七歲男童，因跌倒導致急性肩痛而求診。起初的放射影像與肱骨大結節撕裂類似，其後的測檢卻顯示影像是因鈣化性肌腱炎所導致。患者很快康復，鈣化性肌腱炎亦完全消失。

bony metastasis, infective arthritis, osteomyelitis, gouty arthritis, adhesive capsulitis, and rotator cuff pathology. More probing investigations can narrow down the differential diagnoses, which could include: blood for white cell counts, search for abnormal blood biochemistry and inflammatory markers, as well as radionuclide imaging and MRI.

The exact cause of calcific tendinitis of the rotator cuff muscles is unknown. It is characterised by the presence of macroscopic deposits of hydroxyapatite (a crystalline calcium phosphate) in the relevant tendon.⁴ During the acute resorptive phase, patients usually experience intense pain, inflammation, and markedly limited range of



FIG 1. (a) Anteroposterior and (b) lateral radiographs of the 7-year-old boy with acute calcific tendinitis of supraspinatus tendon. (c) Close-up view of the calcified lesion. (d) T1-weighted and (e) T2-weighted magnetic resonance images with hypointense signal of the calcified lesion, also hyperintense signal in supraspinatus muscle and surrounding soft tissue, suggestive of oedema



FIG 2. Anteroposterior shoulder radiograph taken 1 week later with complete resorption of the lesion

shoulder motion, which mimics the clinical picture of acute pyogenic arthritis. Radiographs of the involved shoulder usually show typical features (as described). Treatment options consist of conservative ice therapy, oral analgesics including anti-inflammatory drugs, injection of local anaesthetic with or without concomitant steroid infiltration. If conservative treatment fails, large-gauged needle aspiration under fluoroscopic guidance may be considered. Typically

a toothpaste-like material can be aspirated during the resorptive phase with immediate relief of the excruciating pain.

In the paediatric population, acute, calcific, supraspinatus tendinitis is exceedingly rare, only a few cases have been reported. Thus, the child described by Nutton and Stothard¹ underwent surgical treatment, and Choi et al's patient² had open arthroscopic treatment. Bittmann³ successfully treated a 13-year-old girl with calcific tendinitis of supraspinatus tendon conservatively, with non-steroidal anti-inflammatory drugs. Only Choi et al's case² had an MRI, which showed the calcific lesion, whilst Nutton and Stothard's patient¹ only had a suboptimal-quality shoulder radiograph.

I believe the patient described is the fourth such patient reported in literature, and for the case both high-quality radiographs and MRI were available. The radiographic appearance of the calcific lesion was amorphous in shape, homogenous in content, and lacking any bony trabeculations or thickened cortical rim, all features being typical of calcific tendinitis. The signal changes in MRI provided further supportive evidence of the acute inflammatory nature of this condition. Moreover, MRI is a more sensitive and specific means of making a diagnosis with the exclusion of the other possibilities, such as acute traumatic fracture of proximal humerus and septic arthritis.

References

1. Nutton RW, Stothard J. Acute calcific supraspinatus tendinitis in a three-year-old child. *J Bone Joint Surg Br* 1987;69:148.
2. Choi ES, Park KJ, DimYM, Kim DS, Shon HC, Park JK. Calcific tendinitis of the supraspinatus tendon in a 7-year-old girl—a case report. *J Korean Orthop Assoc* 2007;42:400-3.
3. Bittmann S. Calcific tendinitis of the supraspinatus tendon in children. *Eur J Orthop Surg Traumatol* 2004;14:180-1.
4. Gärtner J, Simons B. Analysis of calcific deposits in calcifying tendinitis. *Clin Orthop Relat Res* 1990;254:111-20.