

ISOLATED AVULSION FRACTURE OF THE LESSER TUBERCLE OF THE HUMERUS IN CHILDREN

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Isolated avulsion fracture of the lesser tuberosity of the humerus has been reported in few instances. We present a case in a 15-year-old boy who was injured 2 years earlier. Clinical, radiological and interoperative findings are presented and discussed.

Keywords : humerus ; fracture ; children.

Mots-clés : humérus ; fracture ; enfant.

INTRODUCTION

Isolated avulsion fracture of the lesser tubercle of the humerus in children has rarely been reported in the literature (3, 5, 6). To our knowledge, only five such cases have been reported. Avulsions of the lesser tubercle of the humerus in children differed from the reported fractures that occurred in adults (1). These avulsions have also been reported in association with glenohumeral dislocation, dislocation of the biceps tendon or shoulder dysfunction (4). Recently isolated rupture of the subscapularis tendon without osseous injury has been described (2).

In children, the diagnosis was never made at the time of trauma, but several months or years later based upon mechanical dysfunction of the glenohumeral joint.

CASE REPORT

A 15-year-old boy was seen because of a painful right shoulder ; he was a right-hand dominant volleyball player. The shoulder had been injured at the age of 13 years, when the arm was forcefully externally rotated during a game. After the injury the patient was initially unable to move his arm, but he gradually regained use of the shoulder. Persistent dysfunction of the shoulder subsequent-

ly developed with progressive pain and apprehension with the shoulder in abduction and external rotation. He could not continue to play volleyball. He had full active motion but external rotation was 100° with the elbow near the body (the left side was 70°, the left side was thoracic 8), and internal rotation was limited to lumbar 2. The patient felt pain on internal rotation against resistance. Radiographs demonstrated a large benign-appearing mass originating anteromedially from the proximal metaphysis (fig. 1). A magnetic resonance imaging (MRI) study (fig. 2) was made to eliminate an osteochondroma and to appreciate the volume of the lesser tubercle. The exact site of the broken tubercle was not clearly seen because there was a bone mass with fibrous tissue between the lesser tubercle and metaphysis of the humerus. The biceps tendon was in its groove. The anterior aspect of the joint was closed by fibrous tissue and was not open as would have been the case in a cranial rotator cuff tear. Because of the disabling symptoms the patient elected to have a surgical reconstruction. An anterior approach to the shoulder was used. The soft tissue was dissected subperiosteally from the mass. The subscapularis tendon was found inserted on the posterior portion of the bone mass. The bone fragment was united by fibrous tissue to the proximal metaphysis so that the subscapularis muscle was able to provide some active internal rotation. The anterior capsule was not retracted and was quite easy to mobilize.

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Fig. 1A. — AP view in neutral position.

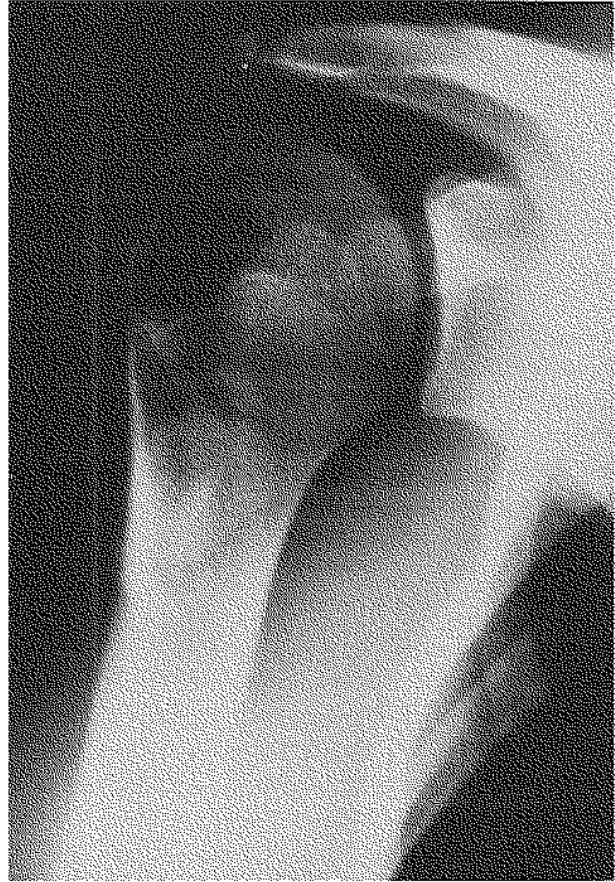


Fig. 1B. — AP view with internal rotation.

Fig. 1. — Antero posterior radiograph, 2 years after the initial trauma, demonstrating a proximal humeral exostosis and the fragment of the lesser tuberosity.

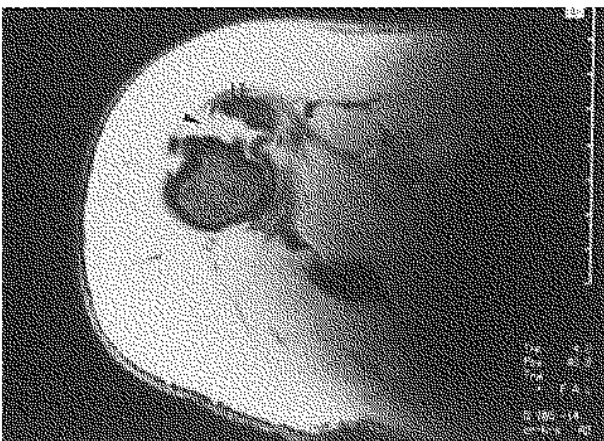


Fig. 2. — MRI demonstrating the fibrous tissue between the proximal humerus and the lesser tubercle (L.T.).

It was necessary to close the rotator interval by three sutures. The subscapularis tendon and capsule were reattached proximally in their normal anatomical position in an osseous trough using one cancellous screw. The shoulder was found to be stable throughout a normal range of motion. The patient was managed with a routine post-operative home rehabilitation program, excluding external rotation for 6 weeks.

At 6 months postoperatively, he had had no recurrence either of the instability or of the mechanical symptoms. When last reviewed one year after surgery, he had full active motion of the shoulder. Range of motion of both shoulders was symmetrical. The lift-off test was normal, internal rotation was pain-free and the anterior apprehension test had become negative.

DISCUSSION

Isolated avulsion of the lesser tubercle of the humerus by the subscapularis muscle is rare in children. The diagnosis is often delayed. In our case, as in Klasson's (3) cases the initial symptoms had resolved by the time of examination. White's (6) case and Shibuya's (5) case were seen at the time of trauma and the diagnosis was based on the loss of internal rotation power. The mechanism of injury was an external rotation force in all cases. In our case there was no loss of motion; on the contrary, the patient had external rotation of 100° on the injured side versus 70° on the contralateral side. Internal rotation was limited to L2 on the right side and was normal to T8 on the left side. This case differs from Klasson's case (3), in which external and internal rotation were limited by an osseous mass. Our patient had mechanical dysfunction of the shoulder: numb arm, popping sensations, and loss of motor strength. Radiographs demonstrated an osseous mass originating anteromedially from the proximal humeral metaphysis. There was no atrophy of the subscapularis muscle, as was shown on the MRI. A fibrous union developed between the lesser tubercle and the humerus, so that the subscapularis muscle was tethered distally to the mass through the fibrous union and assumed an abnormal oblique course. In our case symptoms occurred for two reasons: active internal rotation was difficult because of the reduced power of contraction of the subscapularis muscle (because of the lengthening of its tendon by fibrous tissue) and because of the exostosis that mechanically impeded internal rotation. The abnormal insertion of the avulsed capsule may cause the glenohumeral ligaments to become lax and predispose the shoulder to instability.

MRI and radiographs make it possible to recognize this lesion as benign and avoid confusion with an oncological problem. Operative management to excise the fibrous tissue between the lesser tubercle and humerus and to repair the tubercle seemed to be from a mechanical view, the best way to avoid shoulder dysfunction.

In conclusion, the present report illustrates the difficulty in diagnosing such a lesion in an emer-

gency. Operative management is indicated in all patients. Especially for sports activities with external rotational motion, anatomical reconstruction is the best way to avoid shoulder dysfunction.

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SAMENVATTING

J. C. LE HUEC, T. SCHAEVERBEKE, M. MOINARD, M. KIND, D. CHAUVEAUX, A. LE REBELLE. Afrukkingsfractuur van tuberculum minus humeri bij het kind.

Enige gevallen van afrukkingsfractuur van het tuberculum minus van de humerus bij het kind werden gerapporteerd. Beschrijving van het geval van een 15 jarige jongen, die een schoudertrauma 3 jaar tevoren opliep. Bespreking van de klinische, radiologische en peroperatieve vaststellingen.

RÉSUMÉ

J. C. LE HUEC, T. SCHAEVERBEKE, M. MOINARD, M. KIND, D. CHAUVEAUX, A. LE REBELLE. Fracture par arrachement du trochin chez l'enfant.

Quelques cas de fracture-arrachement isolées du trochin de l'humérus ont été rapportés. Nous présentons le cas d'un garçon de 15 ans qui avait subi un traumatisme de l'épaule deux ans auparavant. Les constatations cliniques, radiologiques, et per-opératoires sont présentées et discutées.