SMALL LIGAMENT INJURY

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SUMMARY

Here we describe a case report of a small ligament injury in the shoulder of a 14-year-old young male athlete, player of the Brazilian Baseball National team. This kind of injury is uncommon and little described in literature. Treatment provided was the suspension of sport-related activities for three months, followed by a gradual return to throws. The patient evolved to clinical picture resolution.

Keywords: Shoulder fractures; Baseball; Epiphysis, Slipped

INTRODUCTION

With the introduction of increasingly organized sportive programs, children and adolescents are engaging in higher competitive activities [1-4]. Baseball athletes, particularly the pitchers, have been submitted to a higher demand on upper limbs in an attempt to achieve a better performance and, as a result, an increased throw speed. Nevertheless, pursuing a better performance has led to an increased incidence of injuries, including shoulder's small ligament injury [2].

The small ligament injury in the shoulder affects the physeal region of the humeral proximal third. In 1953, Dotter reported a fracture affecting the epiphyseal cartilage of humeral proximal third in a 12 year-old pitcher [5,6]. Adams, in 1965, reported this pathology as being an epiphysitis [6,7]. Cahill et al., after studying five cases, believed that this was fracture caused by stress on this region's growth plate [7]. Barnett, in 1985, described the term "proximal humerus epiphysiolysis" as being the most adequate one, according to his opinion [6].

The small ligament injury of the shoulder seems to be caused by stress to which the physeal region of humeral proximal third is submitted at the moment of throw [2,5,7]. It is characterized by leading to pain during throw and to X-ray images changes, characteristic of physis of the humeral proximal third.

THE CASE

A 14 year-old patient, student and pitcher of the Brazilian Baseball National Team, was experiencing pain on the right shoulder (dominant shoulder) at the moment of throw for the last two months, after a preparatory game series for the world baseball championship, which would happen that year. According to the athlete, pain was progressively getting worse, disturbing his performance. Pain was worse in throwing movements, irradiating to the anterior region of the shoulder and arm, which improved with rest. At physical examination, motion of the affected shoulder was complete, with no restraints to arm inward rotation, when at 90º of abduction; in that position he referred pain when reached its maximum outward rotation. That pain was located at the anterior portion of the shoulder, and he experienced that pain, but in an increased strength, at apprehension maneuver. Nevertheless, questions existed if such pain improved with the relocation test. The O'Brien maneuver, for SLAP-type injury detection, was positive. The patient didn't present any pain at shoulder palpation and in tests for Impact Syndrome detection.

X-ray images of the affected shoulder were requested, which were performed at that same day (Figures 1 and 2). We noticed the presence of an enlargement and irregularities

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at the growth physis of humerus proximal third. By physical examinations and by X-ray findings, we decided to request a tomography and an arthro-resonance. Obviously, the patient was immobilized with a canvas sling for a relative immobilization of the affected limb, being allowed assisted passive and active movements, as well as isometric exercises for scapular wrist muscles.

After 10 days, the patient brought us the imaging tests (Figures 3 and 4), which showed the presence of a fracture at growth physis site of the humerus proximal third, and no changes existed to rotator cuff muscles, labral tissue and arm's biceps muscle. Then, the diagnosis of shoulder small ligament fracture was delivered. Thus, this patient was recommended to remain with affected limb in relative rest for three months.

When the patient came back for a follow-up visit, after three months, he reported no pain at all, even at the Apprehension maneuver and at the O'Brien's test. X-ray images still showed an enlargement of affected physis. At that point, the patient was allowed to return to his athletic drills, according to a protocol of progressive return to throws [8] and six months later he was completed integrated to team, and pitching without complaints.

After one year of follow-up, the athlete was able to play an entire game without complaints, being satisfied with the outcome of his treatment, and does not present any motion deficit. Nevertheless, on X-ray images, we still see a little enlargement of growth physis at the affected humerus proximal third when compared to contra-lateral side (Figures 5 and 6).

Figure 1- *X-ray image at corrected frontal plane of the right shoulder, showing significant enlargement of the growth physis of the humerus proximal third, as well as irregularities on its borders.*

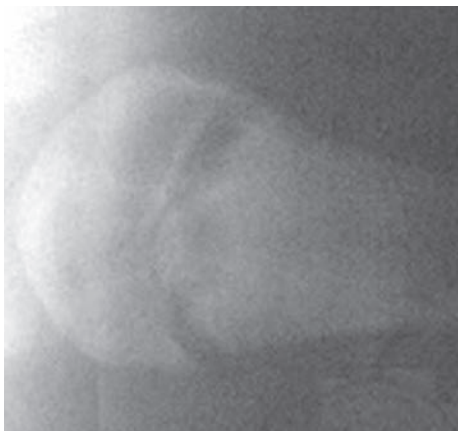

Figure 2 - *X-ray image at axillary position of the right shoulder, showing enlargement of growth physis of humerus proximal third and irregularities on its borders.*

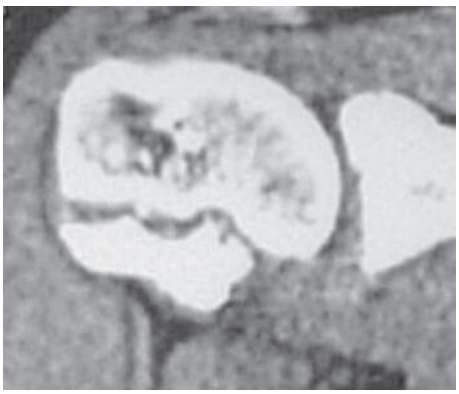

Figure 3 – *Computed tomography image of the right shoulder, of which coronal section shows enlargement of growth physis.*

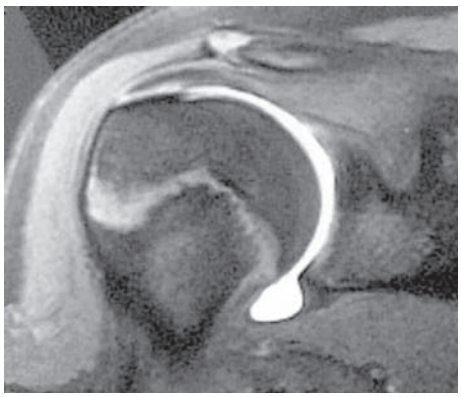

Figure 4 – *Nuclear Magnetic Resonance image of the right shoulder, coronal section in T2, showing enlargement of growth physis of humerus proximal third, localized edema, and irregularities on its borders.*

DISCUSSION

During the acceleration phase, the shoulder goes from abduction and lateral rotation to adduction and medial rotation. By the action of rotator cuff muscles, inserted proximally to growth physis and to major pectoralis, deltoid and triceps muscles inserted distally to it, a stress occurs on physeal region [5,7,9,10]. Physeal injuries are similar to a SALTER-HARRIS I- type detachment, where physis detaches at the hypertrophic layer, with proliferation layer remaining with the epiphysis and the calcification layer with the metaphysis [3,5,9-11].

The major complaint of patients is shoulder pain during and after throwing activities [4-6]. Clinically, a normal range of motion is seen and, occasionally, a volume increase at anterior and lateral portions of affected shoulder [5,6]. Imaging tests show the following features: physis enlargement, both at X-ray and at Nuclear Magnetic Resonance, as well as lateral fragmentation, sclerosis and calcification signs [2,4-7]. These findings are compatible with other pathologies caused by chronic stress to a physis, such as at the distal third region of the radius, which may occur in young athletes [12]. This enlargement of physis is due to the proliferation of germinative cells[5].

The best X-ray plane for diagnostic purposes is: corrected front in inward and

outward rotation of comparative shoulders [5,6]. This pathology is more common in athletes in the age group of 12 – 16 years old because physis is growing fast, and, as a result, more fragile [5]. Treatment consists of rest from any throwing activities until total remission of symptoms, which occurs within six weeks to three months in average [2,4-7]. Resolution of X-ray findings is nor required [5].

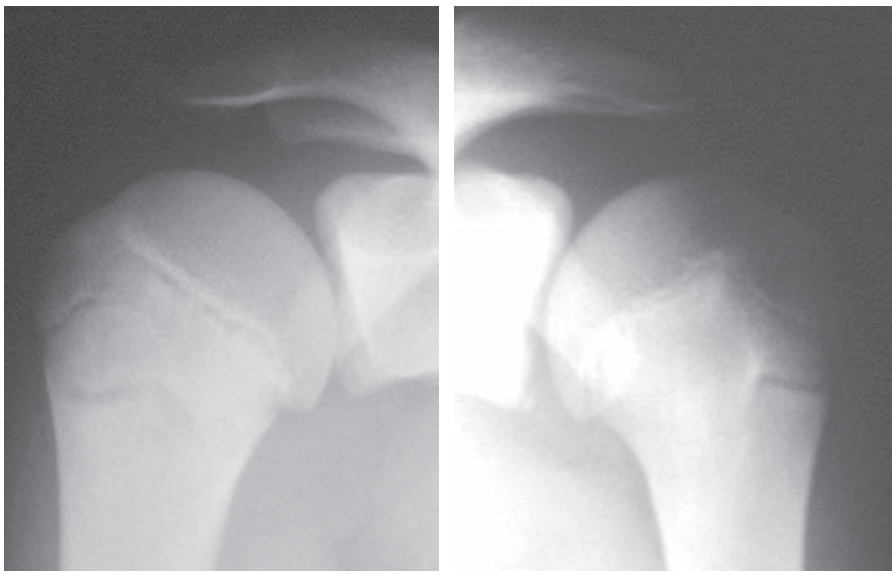

Figure 5 and 6 – *X-ray images at corrected frontal plane of the right shoulder (5) and left shoulder (6), where we observed a major reduction of the growth physis enlargement (5), compared to previous X-ray images, but still slightly enlarged when compared to contralateral side (6)*

In this case, the athlete had only pain complaints at the anterior portion of the shoulder at the moment of pitching. He did not present with pain after a drill or game. He had no pain at palpation on lateral portion of the shoulder (most common painful site) [5] and his physical examination simulated a SLAP-type injury. However, back at baseline X-ray images, we could diagnose the presence of small ligament fracture and, theoretically, this would be enough for diagnosis. Nevertheless, we preferred to further study the case by means of other imagining tests, since that athlete's clinic was a little different from usual for that pathology.

As reported in literature, this athlete did not present with any kind of complaint after three months of relative rest and after one year of follow-up. He is now playing normally, with no complaints or lost range of motion, although X-ray images of the affected shoulder still show a slight enlargement of the growth physis when compared to contralateral side.

The small ligament injury should be part of the differential diagnosis in young pitching athletes presenting with pain at dominant shoulder [2,4].

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