



Coracoid Process Fracture in Children: A Case Report

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Abstract

Coracoid process fractures are unusual injuries, especially in children. They are frequently associated with additional injuries of the shoulder girdle. We report a rare case of fracture of the base of the coracoid process associated with a fracture of the distal end of the clavicle in an immature skeleton. The diagnosis was confirmed by CT-scan. The fractures were treated by open reduction and internal fixation. Functional outcomes were good. The clinical signs of coracoid fracture are not specific and fracture can be overlooked in standard X-ray. The CT-scan allows the diagnosis. The treatment is surgical except for isolated non-displaced fractures. Functional outcomes are usually good.

Subject Areas

Orthopedics, Pediatrics, Surgery & Surgical Specialties

Keywords

Paediatric Orthopaedics, Shoulder Injury, Coracoid Process, Fracture, CT-Scan, Surgery

1. Introduction

Coracoid process fractures are unusual injuries, especially in the children population. They account 2% to 13% of all scapular fractures [1]. They are frequently accompanied by additional shoulder girdle injuries [2]. The diagnosis can be missed especially when the fracture is associated with other injuries of the shoulder [3]. We report a rare case of fracture of the base of the coracoid process associated with a fracture of the distal end of the clavicle in an immature skeleton. The fractures were treated by open reduction and internal fixation.

2. Case Report

A 12-year-old boy was admitted to the emergency department for trauma of the right shoulder after a direct crushing of the shoulder on a wall. Clinically, he had a swelling and pain of the shoulder and scapular area. No vascular and nerve complications were noted. Standard X-ray revealed a fracture of the distal end of the clavicle and a possible coracoid process fracture. A CT-scan confirmed the fracture at the base of the coracoid process (**Figure 1**). The patient underwent surgical treatment with reduction and screw fixation of the coracoid fracture and reduction of the fracture of the distal end of the clavicle fixed by 2 k-wires (**Figure 2**). Post operatively, shoulder immobilisation was performed for 3 weeks and the patient started the graded movement of the shoulder. K-wires were removed at 6 weeks. Strenuous activity was avoided for 2 months. At 6 months follow-up, the shoulder had a normal range of motion without pain. At the radiographs, no complications were noted. (**Figure 3**)

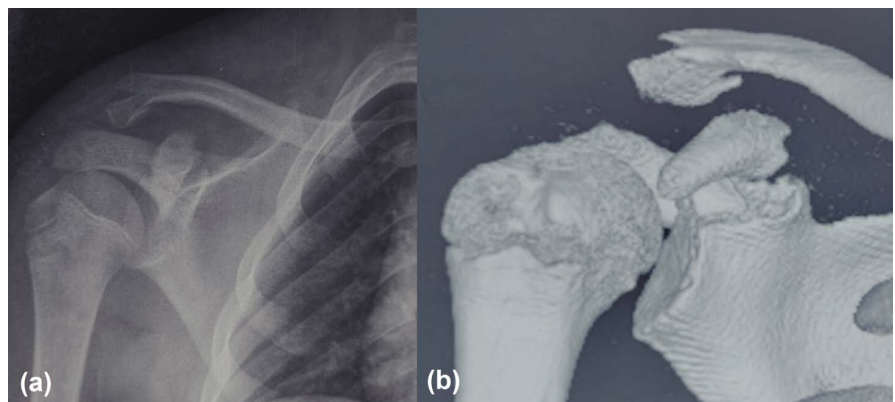


Figure 1. Antero-posterior X-ray (a) showing a fracture of the end of the clavicle with the fracture of coracoid process confirmed in the 3D reconstruction of CT-scan (b).



Figure 2. Post-operative X-ray showing the reduction of the fractures fixed by K-wires in the clavicle and a screw in the coracoid process.



Figure 3. Clinical (a) and radiological (b) outcomes at 6 months follow-up.

3. Discussion

Coracoid process fractures are rare, accounting 2% to 13% of all scapular fractures [1]. They are more uncommon in adolescents. A few cases were reported in literature [1]-[6]. These fractures can be isolated, but they are frequently associated with other injuries of the shoulder girdle: dislocation of acromioclavicular joint (ACJ), clavicular fracture, acromial fracture, scapular spine fracture or glenoid fracture [1] [7]. The acromioclavicular joint dislocation is the most frequent associated injury in adults. In children, ACJ dislocation is exceptional and replaced by clavicle end fracture or a pseudo dislocation of the ACJ [2]. In our case, the mechanism of the fracture was a direct trauma of the shoulder which is the most frequent cause reported in the literature [5]. As the coracoid process is found under the clavicle and is protected from direct blows, the mechanism is controversial. The fracture could be due to a sudden and violent contraction of the conjoined tendon of the short head of the biceps, coracobrachialis and pectoralis minor or by the acromioclavicular ligaments [5] [8]. In an immature skeleton, the fracture is usually located at the epiphyseal base of the coracoid and the upper quarter of the glenoid or through the tip of the coracoid process [4]. Several classification systems for coracoid fractures in adults have been described, Mondori and al. [3] proposed a classification for fractures of the coracoid process in adolescents depending on the location of the injury: type I, the base including the area above the glenoid, type II the centre and type III, the tip.

The diagnosis of coracoid process fracture can be missed especially when the fracture is associated with other injuries of the shoulder girdle. Clinical signs are not specific and attention is drawn to the clavicle injury [9]. In the X-ray, the coracoid process may be overlooked because of the complexity of anatomical structures and superimposition [3]. The CT-scan allows the diagnosis of the fracture and the assessment of its displacement [10].

The management of this injury is controversial. Several reports recommend conservative treatment for isolated fractures [10] [11]. Indications for surgical

treatment are fracture displacement of more than 1 cm, associated scapular fracture, disruption in superior shoulder suspensory complex, and symptomatic non-union fracture [6] [11]. In a systematic review, Ogawa and al. [1] noted that there is no significant difference between the efficacy of surgical and non-surgical treatment. However, they recommended surgical treatment in cases of associated fractures of the shoulder girdle. Other recent reports indicate a tendency towards surgical management of these injuries even in skeletally immature patients. Surgical treatment allows early postoperative rehabilitation with mobilisation exercises. The preferred surgical procedure in adults and in adolescent is open reduction of fracture and fixation with cannulated screw [6] [12]. Functional outcomes are usually good. Rare cases of poor results have been reported in the misdiagnosis of fractures or in case of conservative management of displaced fractures [3] [10]. A study showed that conservative treatment resulted in non-union in 4 of 9 cases [13].

Although fractures of the coracoid process are uncommon, particularly in children population, they must be sought especially in the presence of fracture of the shoulder girdle. The CT-scan allows diagnosis and assessment of displacement. In Adult and paediatric populations, treatment is surgical except for the rare cases of isolated and non-displaced fractures.

Conflicts of Interest

The authors declare no conflicts of interest.

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