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Pure proximal humerus fracture-separation in a 7 years old boy

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Abstract
Introduction: Proximal humerus Fracture-separation is uncommon. This case concerne a pure proximal humerus fracture-separation.
Case report: A 7 years old boy, pipul, right handed was admitted to the emergency department for right shoulder trauma. The exploration showed a pure proximal humerus fracture-separation. Under general anesthesia, a close reduction associated to intramedullary kirschner wire fixation was performed. An iatrogenesis fracture at the wire entring hole was observed. An additional brochio-antebrachiopalmar circonferancial plaster was done. At four months follow-up, The radiological and functional results were satsifactory.
Conclusion: Pure proximal humerus fracture-separation in children is rare. If the treatment is performed adequately and earlier, the functional and radiological outcomes are satisfactory.

Keywords: Growth plate, Intramedullary Kirschner wire fixation, Pure fracture-separation, proximal humerus

Introduction
Proximal humerus fractures (PHF) are rare [1]. In children, they comprise approximately 2% of all pediatric fractures [1]. The usual mechanism of injury is hyperextension combined with external rotation of the shoulder [2]. The fractures are either metaphyseal [3], or epiphyseal separations [4]. The diagnosis is based on plain radiographs [5]. Fractures are classified according to their severity and anatomic location [6]. Fractures involving the growth plate are classified with the Salter-Harris fracture classification [7]. The bone healing and spontaneous remodeling of proximal humerus fractures in children are usually good [8]. However, the more displaced the fractures and the older the children are, the poorer the results will be [8]. Persistent deformity, such as shortening, may decrease the outcome [9]. Surgical fixation has traditionally been recommended in PHF when closed reduction is unsatisfactory [10].
Proximal humerus Fracture-separation (PHFS) is uncommon [11]. It occurs with greatest frequency in boys between the ages of 11 and 17 years old [11]. Mostly, this injury presents as Salter-Harris type I or II injuries [12].
Pure proximal humerus separation fracture (PPHSF) is rare, less reported in the literature [2]. We report a case of PPHSF in a 7 years old boy.

Case Report
A 7 years old boy, pipul, right handed with no pathological both medical and surgical history background. He was pushed by his friend while playing, resulting in a falling down onto his right shoulder. He presented to the emergency department for painful shoulder and swelling. The deltopectoral groove was filled. There was no vascular or nervous impairment. The X-Ray in the lateral and anteroposterior views showed a PPHFS Figure (fig 1).

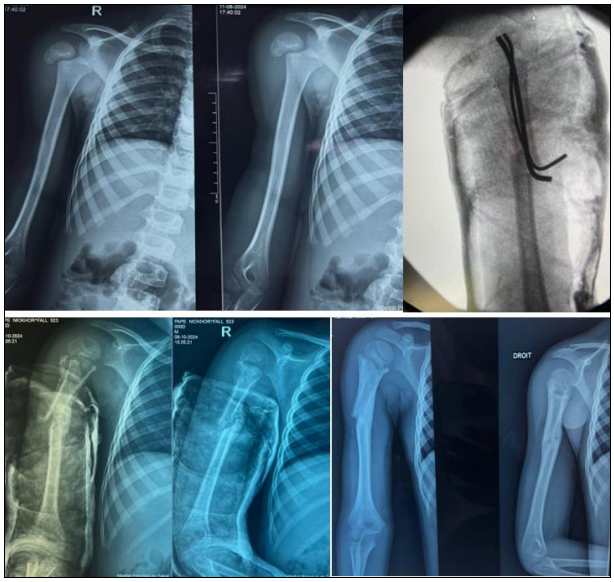

Fig 1: The radiological aspect of the PPHFS associated with intrigenesis humeral diaphyseal fracture treated by kirschner wires fixation and circonferential plaster immobilization.

Within the same day, in the operating room, under general anesthesia, at a close reduction by applying axial traction to the limb, contre traction to the shoulder, mediolateral presser to the proximal end of the distal fragment gave us a perfect reduction under image intensifier control. The reduction was unstable. An intramedullary kirschner wire fixtion was performed. The intramedullary kirschner wire provoqued an iatrogenesis fracture at the wire entring hole during the operation. The iatrogenesis fracture was reduced and immobilized by an additional brochio-antebrachiopalmar circonferancial plaster (fig 1).

Three weeks later, The kirschner wires were removed. At a month more, the both reductions were still maintain. The plaster was removed after a radiographic control.

During the follow up, no secondary displacement of both fractures was seen.

At four months of follow-up, The perfect consolidation of both fractures were obtained without any secondary displacement to the X-ray (fig 1). The shoulder and elbow motions were full (fig 2). There was no functional limitation. He resumed his previous the school. his parents were satisfied.

Fig 2: Shoulder and Elbow range of motion at the last follow up

Discussion

This observation concerne a PPHFS, due to boy playful accident, diagnosed earlier. Surgical treatment was done. The radiological, clinical and functional outcomes were satisfactory in mean term.

The PHF is uncommon [1]. The PHFS is more uncommon [11]. It occurs with greatest frequency in boys between the ages of 11 and 17 years old [11]. The PPHFS in 7 years old kid is rare. Purely epiphyseal proximal humeral injuries occur even more infrequently [12]. the injury was secondary to direct hight energy trauma. There are two common responsible mechanisms, namely a backwards fall onto an out-stretched hand with the arm hyperextended and externally rotated, or direct trauma to the lateral aspect of the shoulder [13, 14, 15, 16]. A standard X-rax allowed to identify the injury. The diagnosis is based on plain radiographs [5]. The treatment was surgical. Surgical fixation has traditionally been recommended in PHF [10]. A variety of stabilization techniques have been described, including Kirschner wires [17, 18]. At mean term, the radiological and functional outcomes were satisfactory. These fractures heal quickly in children and have an excellent prognosis even when left unreduced [19]. The growth plate of the proximal humerus has significant growth potential, as it governs 80% of the bone growth [20].

Conclusion

Pure proximal humerus fracture separation in children is rare. If the treatment is performed adequately and earlier, the functional and the radiological outcomes are satisfactory.

Conflict of Interest

Not available.

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