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Floating Elbow in Children: About 3 Cases

T. Mukenge Wa Mukengeshay[1*], F. B. Balde[1], M. Tazi Charik[1, 2], H. Abdelaoui[1, 2], K. Attaraf[1, 2], A. Afifi[1, 2]

[1]Department of Traumatology and Ortopedic Peditric, Hassan II University Hospital, of Fez, Morocco
[2]Sidi Mohamed Ben Abdellah University, of Fez, Morocco

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***Corresponding author:** T. Mukenge Wa Mukengeshay
Department of Traumatology and Ortopedic Peditric, Hassan II University Hospital, of Fez, Morocco

Abstract **Case Report**

Introduction: We aimed to discuss through a description of three cases of floating elbow in children the management and outcome aspect. ***Observations: Case 1:*** 11-year-old boy. Admitted for for a left floating elbow made by a stage III supracondylar fracture associated with a fracture of both bones of the forearm. He was managed by surgery (K-wire) for both fractures. ***Case 2:*** 4-year-old girl admitted for bilateral floating elbow made by a fracture of the external condyl, associated with a fracture of both bones of the forearm on the right side. In the left upper limb a fracture of the upper extremity of the humerus, stage IV supracondylar fracture and, epiphyseal detachment of the radius. She underwent an orthopaedic reduction for the epiphyseal radial detachment and surgical treatment of the other fractures. ***Case 3:*** 7-year-old patient admitted following a roadway accident, with the lesion assessment of a fracture of the humerus associated with a fracture of the olecranon, of the radial head and diaphyseal fractures of the two bones of the forearm. She received surgical treatment for all of her injuries. With a follow-up of 15 months, the evolution was considered satisfactory. ***Conclusion:*** The floating elbow is both a rare and a complex pathology in children, which combines several concomitant lesions of different severity and prognosis. A precise lesion assessment is necessary for an adequate treatment.

Keywords: Flotting elbow, management, children.

INTRODUCTION

Floating elbow is describe as a supra condylar fracture associated with ipsilateral fracture of the radius and the ulnar. It result a dislocation of the elbow's fonction to the rest of the body [1]. Floating elbow is a very rare association of fractures in children. Its prevalence varies from 3 et 13% [2]. We discuss the management of floating elbow in children through three pediatric observations.

OBSERVATIONS

Case 1

A 11-old boy admitted without delay for an indirect trauma (fall from his length) left elbow in extension. Elbow was swelled, painful, the patient was not able to do the pronation or supination. Forarm was short comparing to the right side. There was no cutaneous wound neither vascular or nervous lesions. At the plan radiograph, he had a supra condylar fracture type III Lagrange and Rigault classification associated with a fracture of the radius and the ulnar located at the diaphyses. He underwent under anesthesia a K-wire pinning of the radius and the ulnar and, X pinning of the supra condylar fracture. We removed de K-wire after consolidation at the 4th month and he had a very good result after 5 years of follow-up.

Case 2

A 4-years old girl admitted without delay for violent trauma dues to fall from the balcony of the third stage. The patient was stable, Glasgow score was 15 and trauma war focused from shoulder to the arm in bilateral. The elbows were deformed, painful without any wound or vascular neither nervous lesions. At the plan radiograph she had a floating elbow in bilatéral. At the right side; external condylar fracture stade II with an ipsilateral fractures of the radius ans ulnar at the diaphyses (Figure 1). At the left side; a bi focal fracture of the humerus (1/3 superior and supra condylar stade IV of Lagrange and Rigault classification) associated with distal epiphyseal fracture of the radius and ulnar type II of Salter and Harris classification (Figure 2). She underwent under anesthésia a K-wire fracture of the external condylar fracture ans the radius and ulnar fracture at the right side and, X K-wire for the supra

consular fracture, orthopedic reduction and castle stabilisation for the distal epiphyseal fracture and the humerus fracture. The castle was removed the 8th week and the K-wire after 3 months. She had good result after three years of follow-up.

Figure 1: Bilateral standard x-ray of the upper limb showing on the right a fracture of the external condyle associated with a fracture of the two bones of the forearm

Figure 2: Standard radiograph of the upper limb bilaterally in the same patient in Figure 1 showing on the left a fracture of the upper extremity of the humerus associated with a supra condylar fracture stage IV and epiphyseal detachment of both forearms

Case 3

A 7-years old girl arm trauma secondary to the public air way accident. She was conscious and stable a deformed and panful right elbow. There was limitation of the extension of the wrist. The plan radiograph showed 3 segmental fracture of the humerus associated with a non displaced fracture of the olecranon and the radial head type II (Figures 3 et 4). She underwent under anesthesia a surgical exploration where we founded the radial nerve comprimed by the humeral fragments. It was intact after liberation. We performed an elastic and medullar pinning by two Metezeau wire 2,5mm (Figure 5). Orthopedic treatment of the olecranon and radial head fractures and stabilisation by castle. We removed the castle at the 5th month and the wire and 5 months. At four years of follow-up, the elbow's flexion was limitantes at 90° with good outcome under physiotherapy were the flexion was possible at 160°. She present a radio ulnar synostosis without any involvement of the pronation or supination (Figure 6).

Figures 3 and 4: Standard X-ray of the upper limb front (3) and profile (4): shows a mid-diaphyseal fracture of the humerus, a fracture of the olecranon, a stage 3 radial head fracture and finally, a fracture of both forearm bones

Figure 5: Standard X-ray face 1-month post-operative, of the patient in Figures 3 and 4

Figure 6: Standard radiograph of the same patient after removal of the K-wire with proximal radioulnar synostosis

DISCUSSION

Initially, the floating elbow was limited to diaphyseal fractures of the humerus and the two bones of the ipsilateral forearm. Currently, it is open to articular fractures of the lower extremity of the humerus associated with the two bones of the ipsilateral forearm. These are the variants of the floating elbow [1]. That was the case of one of our patients who presented as equivalent to the supracondylar fracture: a fracture of the external condyle stage 1.

The age varies between 5 and 15 years, a peak around 8-years [3]. We have a very young 4-year-old patient who accidentally fell from the third floor. Anil Agarwal [4] also reported a floating elbow in a 4-year-old patient. A floating elbow can occur for a high energy trauma or a minimal trauma. Panjak Kumar *et al*., [1] found 76% floating elbow for minimal trauma.

Several types of lesions are reported: supracondylar fracture associated with diaphyseal fracture of the two bones of the forearm, articular fractures such as the external condyle with a radial neck fracture, of the olecranon, etc. All these associations have in common the functional dissociation of the elbow from the rest of the body.

The choice of treatment depends on the types of associated fractures. Kinkpe *et al*., [5] opted for orthopaedic treatment for a floating elbow combining a stage IV supracondylar fracture by the Blount method and a fracture of the distal quarter of the two forearm bones.

However, the authors report secondary displacement during orthopaedic reduction of the floating elbow for frequencies ranging from 7 to 25% [6.7]. Therefore, stable internal/external fixation of all fractures has been advised as a management protocol for the floating elbow [8]. Our attitude was surgical in almost all the fractures. And we found the surgical management sometimes 100% for the floating elbow in children [1, 9, 10].

The preoperative complication encountered was damage to the radial nerve, damage to the suspicious nerve and compartment syndrome have been reported [1].

We did not encounter any postoperative complications, so material infections, nerve damage, mal union [1] were reported.

CONCLUSION

Choosing the appropriate treatment for a floating elbow is tricky; several concomitant lesions of different severity and prognosis must be taken care of at the same time in a child. A precise lesional assessment and adequate treatment allows recovery without sequelae.

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Conflict of Interest: None

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