

Elbow Dislocation in Children: About Two Cases and Review of the Literature

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How to cite this paper: Dorcas, N.B., Paterson, A.C., Pauline, M.F., Nadine, K.T., Raïssa, M.B.T., Francis, B.K., Chrisantus, A., Audrey, D.D., René, N., Ismael, A.M., Tatiana, E.M., Stéphane, C.G. and Daniel, H.E. (2024) Elbow Dislocation in Children: About Two Cases and Review of the Literature. *Open Journal of Pediatrics*, 14, 218-226.

<https://doi.org/10.4236/ojped.2024.142020>

Received: January 6, 2024

Accepted: January 30, 2024

Published: February 2, 2024

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Abstract

Background: Elbow dislocations in pediatric patients are rare injuries. This is a therapeutic emergency because a delay in treatment can have disastrous consequences on the functional level of the upper limb. **Objective:** To present the management of elbow dislocation in children in cases of limited resources. **Presentation of the Cases:** These were 2 older male children aged 7 and 9 years old, admitted to the emergency room for painful functional impotence of the right elbow after a fall and landing on the right hand. Clinical and radiological examinations were in favor of posterior elbow dislocations. The reductions were carried out under sedation and immobilization in Jersey. According to Robert's criteria, the functional result was excellent in both patients. **Conclusion:** Emergency reduction and immobilization whatever the means ensure an excellent functional prognosis even in cases of limited resources.

Keywords

Elbow Dislocation, Child, Diagnosis, Treatment, Limited Resources

1. Introduction

Elbow dislocations in pediatrics are rare conditions which represent 3% - 6% of elbow injuries in children [1]. This low incidence is due to the relative strength of the capsulo-ligamentous structures compared to the bony structures [2]. They

frequently affect male adolescents over 10 years of age [3] [4]. The mechanisms most involved are sports falls and/or falls from a height [5]. The most used classification is that based on the displacement of the radioulnar unit relative to the humerus [6]. In this classification, posterior dislocation is the most common, found in 70% in pediatrics [6]. This is a diagnostic and therapeutic emergency because the prognosis depends on the delay in treatment and the associated traumatic injuries [3]. Treatment involves emergency reduction under general anesthesia followed by immobilization for 3 weeks using a volar brachio-antebrachio cast [4]. In countries with limited resources, this arsenal is not always available to parents. We report the management of elbow dislocation in children in a context of limited resources through the presentation of two clinical cases followed by a review of the literature.

2. Presentation of Case 1

It was a 7-year-old male child, with no contributory history, right-sided who lived in an urban area. He was admitted to the emergency room of the Central Hospital of Yaoundé (HCY) for elbow pain and functional impotence following a playful accident. Indeed, during a play session with his friends, the child had landed on the apple of his right hand, elbow extended. This was followed by pain with functional impotence of the right upper limb. Massages were performed using undocumented balms and the child was admitted 4 hours after his trauma to the emergency room due to the persistence of symptoms. On admission, the patient was in pain with pain intensity rated 7/10 according to the visual analog scale (VAS). The primary assessment was normal. Examination of the right upper limb revealed a deformed, swollen elbow (**Figure 1(A)**). The forearm and upper arm formed an angle of 120° (**Figure 1(B)**). Palpation of the elbow was



Figure 1. Appearance of the right upper limb on inspection. (A) Swelling of right elbow; (B) Angle between forearm and right arm.

painful. The elbow landmarks were disorganized with the olecranon being more posterior than the epicondyles. There was no neurovascular deficit in the right upper limb and the rest of the examination was unremarkable. The diagnosis was a dislocation of the right elbow for which an associated fracture had to be excluded. An x-ray of the elbow was taken in frontal and lateral views (**Figure 2**). It revealed a posterior displacement of the olecranon in relation to the distal end of the humerus in favor of a posterior dislocation of the elbow without loss of continuity. Treatment consisted of emergency reduction under sedation. The reduction was done blindly and consisted of traction on the forearm in flexion of the elbow versus extension on the arm. The control radiograph was satisfactory with good congruence of the articular surfaces (**Figure 3**). The upper limb was immobilized with flexion of the forearm on the flexed arm with an angle of 125° using the Jersey (**Figure 4**) for 4 weeks. Follow-up appointments were recommended at 4 weeks and 8 weeks. At 4 weeks, flexion of the forearm on the right



Figure 2. Radiograph of the right elbow; (A) Frontal view; (B) Lateral view; (a) Posterior displacement of the olecranon.



Figure 3. Control X-ray of the right elbow after reduction; (A) Frontal view; (B) Side view.

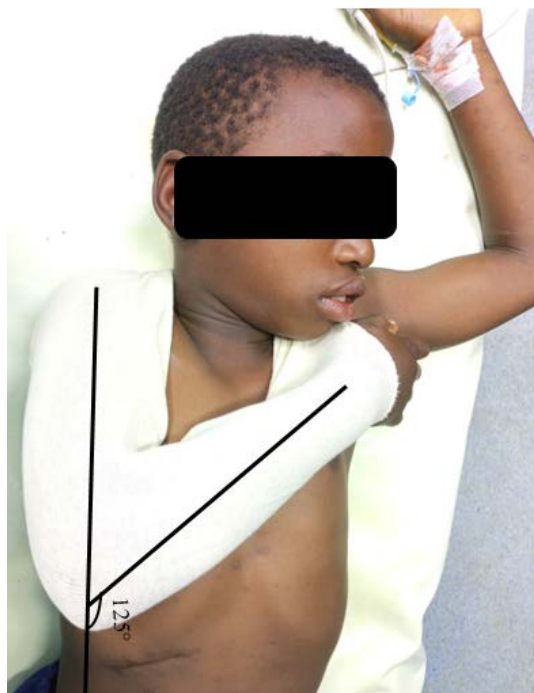


Figure 4. Immobilization technique after reduction using the Jersey.

arm was possible up to 130° and extension up to 155° . Self-mobilization was recommended at home and at 8 weeks, the patient did not present pain and there was no limitation of flexion/extension in the movement of the elbow.

3. Presentation of Case 2

It was a 9-year-old male, right-sided, with no contributory history who lived in an urban area. He was admitted to the HCY emergency room for pain in the right elbow and functional impotence of the right upper limb. They followed a fall from a guava tree with landing on the apple of the hand, elbow extended, which occurred an hour before the consultation. No maneuvers or massages were done on the right upper limb before his arrival. On admission, the patient had pain and his primary assessment was normal. He presented a Desault attitude. The right forearm made an angle of 116° with the right arm and the right elbow was deformed with the olecranon which was more posterior in relation to the epicondyles (**Figure 5**). There was no local swelling. The neurovascular examination was normal. The diagnosis was a dislocation of the right elbow for which an associated fracture had to be excluded. The radiograph of the right elbow revealed a lack of congruence between the distal end of the humerus and the olecranon cavity associated with a posterior displacement of the olecranon with no visible loss of continuity (**Figure 6**). The diagnosis was that of a pure posterior dislocation of the elbow. Treatment consisted of emergency reduction under sedation. The reduction was done blindly and consisted of traction on the forearm in flexion of the elbow versus extension on the arm. After reduction, the control radiograph demonstrated good congruence of the articular surfaces of

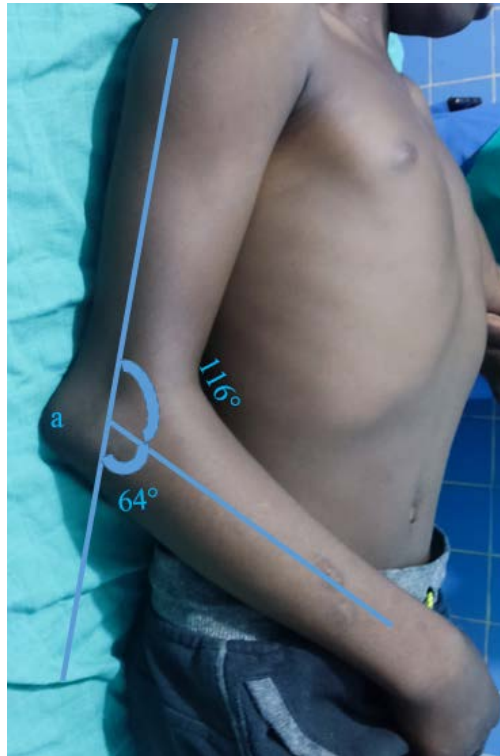


Figure 5. Appearance of the upper limb on inspection. a) Olecranon posterior to the epicondyles.



Figure 6. Radiograph of the right elbow; (A) Frontal view; (B) Side view.

the elbow (**Figure 7**). The upper limb was immobilized with flexion of the forearm on the flexed arm with an angle of 130° using the Jersey for 4 weeks. Follow-up appointments were recommended at 4 weeks and 8 weeks (**Figure 8**). At 4 weeks, the patient no longer had pain. Flexion of the forearm on the right arm was possible up to 125° (**Figure 9(A)**) and extension up to 145° (**Figure 9(B)**). The control X-ray of the elbow was normal (**Figure 10**). At 8 weeks, there was no pain and no limitation of flexion/extension of elbow movement.



Figure 7. Control radiograph of the right elbow after reduction.



Figure 8. Technique for immobilizing the elbow in Jersey after reduction.

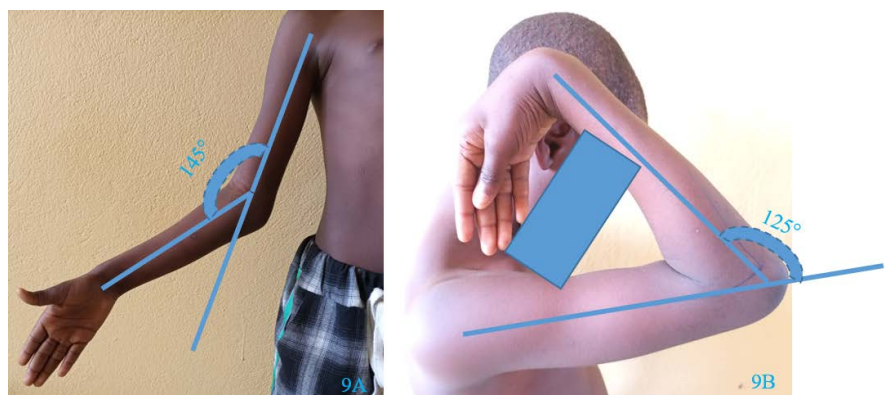


Figure 9. Range of movement of the right elbow after 4 weeks of immobilisation; (A) Extension; (B) Flexion.



Figure 10. Control X-ray of the right elbow 4 weeks after immobilization.

4. Discussion

The annual incidence of elbow dislocations in children is estimated at 6 per 100,000 children [4]. It is therefore a rare condition. It mainly occurs during the second decade with an average age of 11 years. This predominance at this age can be explained by the fact that the level of activity becomes greater around the age of 10. This pathology preferentially affects boys living in rural areas [3] [4]. This can be explained on the one hand by the fact that boys are more active and noisier than girls. Contrary to literature data, our patients resided in urban areas. This is explained by the fact that the HCY is located at the epicenter of an urban area. The mechanisms by which elbow dislocation occurs are: playing accidents, sports falls, falls from high places, collision sports. In 1% of cases, the mechanism is unknown [5] [7]. In Africa, the fall of a tree is the most involved mechanism [8]. Which was the case for one of our patients. This can be explained by the fact that in Africa, trees are almost always present around homes, even in urban areas. It is most often an indirect mechanism with falling and landing on the right hand, elbow extended [7]. This can be explained by the fact that exposing the apple of the hand in the event of a fall is the body's protective mechanism in the event of a fall. Involvement of the right elbow is the most common [8] [9]. This can be explained by the fact that it is the dominant hand that is put forward to protect the body in the event of a fall. However, cases of bilateral dislocation have been described [10]. The dislocation is said to be recent if the consultation is made less than 24 hours after its occurrence. It is old if this delay is greater than 24 hours [11]. Our patients presented with recent dislocations probably due to the proximity of hospitals in an urban setting. Chronic dislocations are more common in patients who reside in rural areas [8]. One of our patients had an elbow deformity while the other did not have any deformity. This can be explained by the performance of the massages and the longer consultation time in the patient who presented with swelling. On the anatomo-pathological level, the

most used classification is that based on the displacement of the radio-ulnar unit in relation to the humerus [6]. Based on this classification, posterior dislocations and their variants are the most frequent and found in nearly 70% of cases [6]. The anterior, lateral and medial forms are rarer [12]. When associated with a fracture, the fracture of the medial epicondyle is the most common [3] [12]. The treatment of elbow dislocations is based on emergency reduction under intraoperative fluoroscopic control and general anesthesia [9]. The reduction of our patients was done under sedation without fluoroscopic control on the one hand due to the limited resources of the patient because the care in our context is solely the responsibility of the patient, and on the other hand due to the insufficient technical platform. The control radiographs made it possible to monitor the effectiveness of the reduction in our patients. Immobilization of elbow dislocations can be orthopedic or surgical. Orthopedic immobilization can be done either by a volar brachio-antebrachio cast or by a splint above the elbow [3] [12]. After immobilization, the functional evaluation of the elbow can be done using Robert's criteria [13]. These criteria take into account the presence of pain, the degree of limitation of elbow flexion/extension when it exists. Therefore, the result is excellent when there are no symptoms and no limitation of flexion/extension in the movement of the elbow. It is good when the symptoms are mild and there is no more than 108° of loss of movement. It is average when the symptoms are moderate and a loss of movement of 108° to 308°. The result is poor if the symptoms are severe with a loss of movement of more than 308° [13]. The functional assessment of our patients at 8 weeks was excellent. This can be explained by the fact that despite the limited resources and the incomplete technical platform, the reduction after admission to the emergency room was done on time. On the other hand, the makeshift immobilization carried out was respected by the patients thanks to the parents.

5. Conclusion

Although rare, the dislocation of the elbow in children is starting to be talked about in the publications. It has a well-codified treatment which, when early and adequate, consists of reduction and immobilization whatever the means.

Author Contributions

All authors have read and approved the final version of the manuscript.

Conflicts of Interest

The authors declare that they have no conflict of interest

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