

Clinical and Functional Outcomes of Isolated Posterior Elbow Dislocations in Children: A Case Series

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Abstract

Elbow dislocations in the paediatric age group are very rare, as similar forces tend to cause supracondylar fractures also. Closed dislocations are an emergency and should be reduced as quickly as possible. The reduction techniques are rather simple and safe. The aim of our study was to analyse the outcomes (functional and clinical results) of isolated elbow dislocations in children. Our results showed that most cases can be treated safely with excellent outcomes by closed reduction followed by immobilization with above elbow posterior splint/ simple arm sling and then physiotherapy.

Keywords: Paediatric Elbow Dislocations; Outcome Analysis; Robert's Criteria.

Introduction

Elbow dislocations are the most common dislocations in the paediatric age group [1,2]. But still, they account for only 3-6% of all elbow injuries in children [3,4].

Traumatic isolated paediatric elbow dislocations are very rare and very few cases have been reported in the literature. Most of the paediatric elbow dislocations are complex and involve associated fractures, this is because the same force causes supracondylar fractures in children. Most of these isolated dislocations are posterior dislocations [5,6].

The aim of our study was to analyze the outcomes (functional and clinical results) of isolated elbow dislocations in children.

Material and Methods

We reviewed retrospectively all the cases of isolated elbow dislocations that we had admitted and treated between August 2014 to August 2017.

Inclusion criteria: All the cases who were less than 18 years of age at the time of dislocation had proper elbow x-rays before and after management and had already 12 months of follow up.

Exclusion criteria: Patients with any associated fractures/open injuries of the elbow were excluded from the study and so were any individuals of greater than 18 years of age.

In all the cases, pre-reduction and post-reduction X-rays (anterior-posterior and lateral views) were ordered. All the dislocations were reduced either under sedation in the emergency room or under general anaesthesia as an emergency procedure. General clinical assessment of the patients was carried out on presentation. The patient was put prone on the bed with his shoulder abducted at 90 degrees, elbow hanging at 90 degrees of flexion and humerus being supported by the bed. One hand was placed around the wrist of the affected arm and downward traction was applied, while the other hand stabilized the humerus and the thumb was placed over the olecranon, and gentle pressure was applied to facilitate reduction. Any medial or lateral displacement was reduced before carrying out distal forearm translation. All the cases were evaluated for stability post reduction. None of the cases which were finally included in

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the retrospective study had any post reduction instability. If instability was found the patients were advised an MRI of the elbow and the requirement of surgical intervention assessed. A neurovascular examination was carried out in all the cases, before and after reduction. The elbow of the patient was immobilized for 3 weeks by either a simple arm sling or a posterior splint depending upon the treating surgeon's preferences. Then we started a gradual range of motion exercises. In all the cases that we used general anaesthesia, we also used fluoroscopy to aid in the reduction procedure. We used the Robert's criteria to evaluate the Functional results at 3 months, 6 months and 12 months.

Results

Only 18 cases fulfilled our study criteria for being included. All the included cases were posterior dislocations. All the patients had presented acutely with deformity and swelling of the elbow within 6 hours of the injury (average 4.3 hours). All the cases were unilateral. 12 of the cases were males and 6 were females. Fall on outstretched hand while playing [14] or fall from a height [4] was the mechanism of injury in our cases. Mean age of the patients was 13.6 years. Functional results were documented at 3 months, 6 months and 1 year of follow up. We used the Robert's

criteria to document the outcomes. 13 of the children had an excellent outcome, 4 had a good outcome and only 1 had a fair outcome. None of our patients had poor outcome. 16 of the patients had an excellent recovery of range of motion with a loss of more than 10 degrees. The loss of movement was mainly in the final ten degrees of extension. Residual complaints of pain were reported in 4 of the patients and subjective symptoms of stiffness in 5 of the patients. None of the patients suffered from any deformity probably from the fact that we had excluded all cases with associated fractures and open injuries.

Discussion

In our study, all the cases were posterior dislocations. Anterior isolated dislocations have also been described [7,8,9]. But we did not come across any such case. It has been postulated that posterior dislocations result from a direct fall on an outstretched hand, while anterior dislocations generally occur from a direct blow from behind the elbow.

In all our cases these had been a history of fall on outstretched hand. The reduction techniques employed most commonly are the "pusher technique", the "puller technique" and the Stimson's gravity method (more preferred in lateral



CASE 1: Fig. 1: 13-year-old boy: Posterior dislocation of the elbow. **Figure 2:** Immediate post-reduction x-rays of the same patient.



CASE 2: Fig. 3: 17-year-old male: Posterior dislocation of the elbow. **Figure 4:** Immediate post-reduction x-rays of the same patient.

dislocations). We employed the “pusher technique” primarily because of its ease and better results. We employed the other technique when this method failed. Although in our study both posterior splints and arm slings had been used for elbow immobilization, O’Driscoll et al. had suggested that if the elbow was stable after valgus force in a prone forearm then the medial collateral ligament was intact which favoured the idea of using slings to facilitate an early range of motion [19].

The fact that both methods had been employed in different patients was also a weakness of our study as the effect of the type of elbow stiffness could be significant.

Our study also showed more male patients than female patients as had been reported by Reed et al. [10]. The total number of cases in our study was very low as most cases were excluded for being associated with other elbow fractures. Similar observations had been made by Kaziz et al and Can et al. [11,12].

Neurological and vascular complications are very rare in isolated dislocations except in open injuries [12,13,8]. Assessment of elbow stability was performed post reduction and at every follow-up. In our review of the literature, we found only 4% of cases ever required surgical stabilization. and 1.5 per cent of cases required surgical open reduction after failed closed reduction. It has been advocated that the cause of recurrent dislocations is probably the failure of the capsule and ligamentous structures to be reattached after traumatic dislocation [14,15]. Very rarely recurrent dislocations have been reported in the literature [14,16,17]. We did not find any such case on follow up.

Conclusion

Traumatic Isolated elbow dislocations in the paediatric age group are very rare injuries, and therefore their documentation had been even rarer in published literature. Although an emergency, the process of reduction is simple and requires minimal resources in the majority of cases with almost excellent outcomes in every case.

Our results show that most cases can be treated safely with excellent outcomes by closed reduction followed by immobilization with above elbow posterior splint/ simple arm sling and then physiotherapy.

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