

Pulled Elbow: Is X-ray Evaluation Really Required?

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Abstract

Introduction: Pulled elbow is a unique condition affecting paediatric population. The mechanism of injury is well stated by the child's parents. The condition is benign and passes uneventfully following a simple reduction manoeuvre in outpatient department. The condition is detected and treated easily by experts hands but to an unwary clinician may suspect it to be a bony injury and patient may be subjected to x-ray evaluation. The study was conducted to address the need to clinically identifying the condition and treating it without subjecting the patient to x-ray.

Methods: This was prospective study carried out in the department of orthopaedics and trauma surgery Tribhuvan university teaching hospital .A total of 20 patients with 21 of total limb were included in the study. Age of the children ranged from 2-6 years of age. The reduction of elbow was done by hyperpronation technique and confirmed by feeling the click at radial head with improvement of symptoms.

Result: Among 21 elbows click of reduction was felt in 19. In two elbows no click of reduction was felt and these patients were subjected to x-ray evaluation .The elbow radiographs were normal and patient improved subsequently.

Conclusion: A careful history taking with good clinical examination is all that is required for diagnosis and prompt treatment of the condition. An x-ray evaluation is not necessary with proper history is taken and when reduction click is felt and the child shows improvement the child can safely be discharged.

Keywords: Pulled elbow, Hyperpronation manoeuvre, x-ray evaluation

Introduction

Pulled elbow or nursemaid elbow as it is colloquially known is a traumatic condition affecting a paediatric elbow .This injury typically has been reported to occur between the age of 2 to 3 years. Girls are more often affected than boys. The left arm is more frequently involved than the right.^{1,2} No such epidemiological reports on this injury are available in Nepalese population.

This injury occurs following a typical mechanism reported by parents in almost all of the cases .In situation where a child is abruptly picked up from the floor by their hands or when a child is suddenly pulled back by their hand as they are falling down. In both of these scenarios a common mechanism is in action

whereby an axial force on pronated forearm causes subluxation of radial head and gets trapped distal to annular ligament.³

The diagnosis of the condition is based on typical history and clinical examination .One of such diagnostic criteria commonly used is that proposed by Schunk.² the role of x-ray has been debated since there is no consensus on diagnostic feature of the radiograph. The radiocapitellar line displacement has been used as a radiological sign but accuracy this subject of proper technique.⁴Ultrasonography has been in use with improved sensitivity and specificity.^{5,6}

In our experience of clinical practice the clinical diagnosis is always possible if this condition is kept in mind. The radiographs are always normal in typical

cases which are often done as per parent's request. The result of reduction with hyperpronation technique with the consistent click that is felt and child starting to use the limb after few minutes of observation is always fruitful along with parent's satisfaction. When parents are questioned about reduction, the observation examination following and movement of the limb the parents are satisfied without the radiographic evaluation.

The aim of the study was to arrive at the conclusion that the condition can be diagnosed clinically without the need for any x-ray of the affected limb.

Methods

The study was a prospective study carried out in the department of orthopaedics and trauma surgery Tribhuvan university teaching hospital between January 2016 to December 2016. 20 children between the ages of 2 to 6 years were included in the study. One case had a bilateral elbow involvement making it a total of 21 cases in total. Diagnosis of pulled elbow was made when typical clinical presentation of elbow pain and refusal to use the limb following history of child being pulled by forearm with no swelling and bruising around elbow. The pain relieved with regain in mobility following hyperpronation reduction manoeuvre further confirmed the diagnosis.

The clinical condition and management was explained to the child's parents. The reduction was obtained using hyperpronation manoeuvre. Following reduction child was observed for half an hour. Once child started voluntary movement of the limb the parents were satisfied and the child was sent home. Parents were asked to come for follow up if they felt needed. They were advised about ways to prevent such injury in the future.

Child with typical history of injury and presence of swelling and bruising were excluded from the study. No radiograph was taken in cases in which definite reduction click was felt.

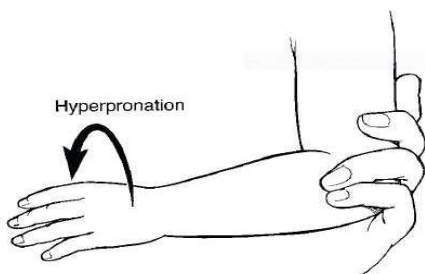


Figure 1: Hyperpronation reduction manoeuvre

Results

The study included 20 participants with 21 affected elbows. The mean age of the children was 3.5 years. Right side was involved in 50% of cases while 45% had left side involved.

There were 55 male patients and 45% were female patients

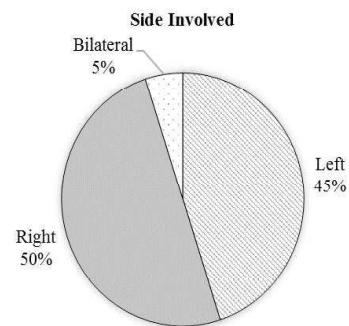


Figure 2: Side distribution

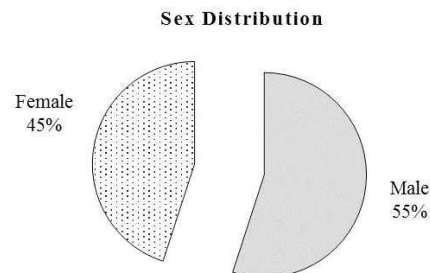


Figure 3: Sex distribution

The reduction click was felt in 19 cases while it was not appreciated in two instances. X-ray with standard views was taken in both cases which revealed no obvious bony abnormality.

Discussion

Pulled elbow is a common but benign condition. Most events pass uneventful following simple reduction manoeuvre in outpatient based setting without subsequent complications.

There is atypical history and presentation which makes the diagnosis obvious to the experienced clinician. Most of the time the parents want to take x-ray to make sure there is no serious injury and those unaware of this situation send for x-ray which is not useful for diagnosis

and management .It unnecessarily exposes the child to radiation and increases the cost of treatment.

In every clinical setting X-ray is the most commonly used diagnostic modality in musculoskeletal trauma. But in the case of pulled elbow its role has been controversial. The injury occurs in age group that may not have yet developed ossification centre of the radial head epiphysis making it difficult to define the relationship of the radial head to capitellum. The other aspect is the ability to obtain accurate standard views of in a busy x-ray department. Non-standard images are the rule rather than exception and are difficult to interpret even if the visible bony structures are intact. The other aspect is accidental reduction of pulled elbow during radiographic positioning for anteroposterior view with the resultant radiograph being normal.

Studies have been done using ultrasonography defining increased radiocapitellar space as diagnostic criteria .⁵ Also ultrasound is being used to explain the varying clinical response after reduction aided by ultrasound classification of the underlying pathology and its impact on management .⁹ his is technically difficult in many resource limited settings.

The common reduction methods that are commonly practised include either supination or hyper pronation manoeuvres. Although final reduction rates are similar, the hyperpronation manoeuvre was more efficient in first attempt, easier for physicians and less painful for the child.⁷ Hyperpronation manoeuvre has been reported to be successful in cases of failed reduction with supination manoeuvre.⁸ In our study also we were able to achieve reduction in all patients with this manoeuvre.

Our study has shown that both the diagnosis and treatment of this condition are possible with proper history and clinical examination and the treatment response following reduction. Even in cases where reduction click was not felt the radiograph was normal and child had favourable response. The torn subluxated annular ligament may be the reason for absence of the click and failure to have immediate improvement in some children.⁹

We feel that it is not necessary to obtain routine radiograph in case of pulled elbow where treatment is possible with clinical assessment alone.

Similar opinion is shared by other authors who also feel that radiograph is unnecessary in pulled elbow where

the clinical diagnosis is obvious and the therapeutic intervention can proceed without delay.¹⁰

Under circumstances where the diagnosis, response or progress is not straight forward radiograph is essential to rule out bony lesion.

Conclusion

It will benefit in our resource limited setting by saving the resource for absolutely essential cases and avoid unnecessary radiation exposure to a child.

Conflict of interest- none declared

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