Symposium Article | Journal of Clinical Orthopaedics 2022 Jul-Dec;7(2):12-14

Managing a Pulled Elbow in the Clinic

Shalin Shah[1], Mandar Agashe[2]

Abstract

Pulled elbow is one of the commonest clinical conditions encountered by the Paediatric orthopaedic surgeon. It is primarily due to axial force applied to a semi-prone forearm which leads to proximal radio-ulnar joint dislocation. Diagnosis is usually clinical and radiographs are rarely needed. Reduction maneuvers include the Traction-supination and traction-hyperpronation method and almost always cause immediate pain relief and return to function.

Keywords: Pulled elbow, Proximal radioulnar joint dislocation, Supination maneuver, Hyper-pronation maneuver.

Introduction

Pulled elbow or Nursemaid's elbow is a clinical entity wherein the annular ligament of a child displaces over the radial head and becomes entrapped causing a painful non-use of the involved extremity (Figure . 1). Pulled elbow is one of the most common pediatric emergencies presented to the orthopedic clinic and is also one of the most rewarding one where a reduction causes an immediate relief to the child's pain and to the parents' anxiety.

Pulled elbow is a common elbow injury in the child typically presenting between 1 -and 4 years of age though case reports with age less than <6 months and up to 11 years of age have been published. By 5 years, the annular ligament becomes taut and strong so that slippage or a tear is difficult. The most common mode of occurrence of a pulled elbow is a forceful pull on an extended elbow with a pronated forearm. This traction causes a slip of the annular ligament over the radial head and this annular ligament gets entrapped after the slip. There is no actual subluxation or dislocation of the radial head but a slip of the annular ligament over the radial head. Among other modes, twisting of the limb, fall while playing, playing with the babysitter, or a sudden pull by the child himself may be the cause. The parents may also give the history of a pop felt around the elbow. Anecdotally, the history of fall may many times be assumed by the parents or guardian.

A child with a pulled elbow will typically present with a painful non-use of the affected extremity. The pain described by the parents, or the child may be anywhere over the entire limb from clavicle to the wrist, but an examination would rule out any focal swelling or tenderness over the wrist or shoulder. There is no restriction of elbow or forearm range of motion, though it is difficult to check in a crying child. Neurovascular examination would also be normal.

In children with classical history and age distribution without a history of trauma or fall, no radiological investigation is necessary before proceeding to reduction. Table 1 shows the red flag signs which would mandate a radiograph or further evaluation before reduction. [1].

Differentials

Following are the differentials of pulled elbow which must be kept in mind while examining:

1. Fracture around the elbow
2. Isolated radial head dislocation / Monteggia variant.
3. Clavicle fracture
4. Type 1 physeal fractures of the upper limb.

Radiographs are usually enough to differentiate these fractures and dislocation from a pulled elbow. In a pulled elbow, the radiograph is completely normal. Type 1 physeal fractures may be initially normal on appearance but will show changes at a follow- up radiograph after a week or on magnetic resonance imagingMRI evaluation.

[1]Department of Paediatric Orthopaedics, BJ Wadia Hospital, Mumbai, Maharashtra, India,
[2]Consultant Paediatric Orthopaedic Surgeon, Agashe Hospital, BJ Wadia Hospital and SRCC Children's Hospital, Mumbai, Maharashtra, India.

Address of Correspondence
Dr. Mandar Agashe, Agashe's Hospital, off LBS Marg, Near kalpana talkies, Kurla West, Mumbai, 400070, India.
E-mail: mandarortho@gmail.com

Submitted Date: 10 Jun 2022, Review Date: 12 Jul 2022, Accepted Date: 27 Oct 2022 & Published Date: 10 Dec 2022

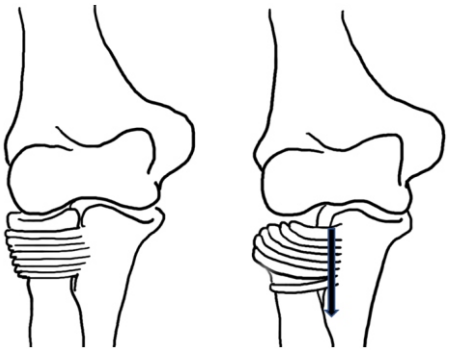

Figure 1: A pull on an extended elbow with a pronated forearm causes the annular ligament to slip and interpose between the radial head and the capitellum (Illustration by Dr. Hirva Manek).

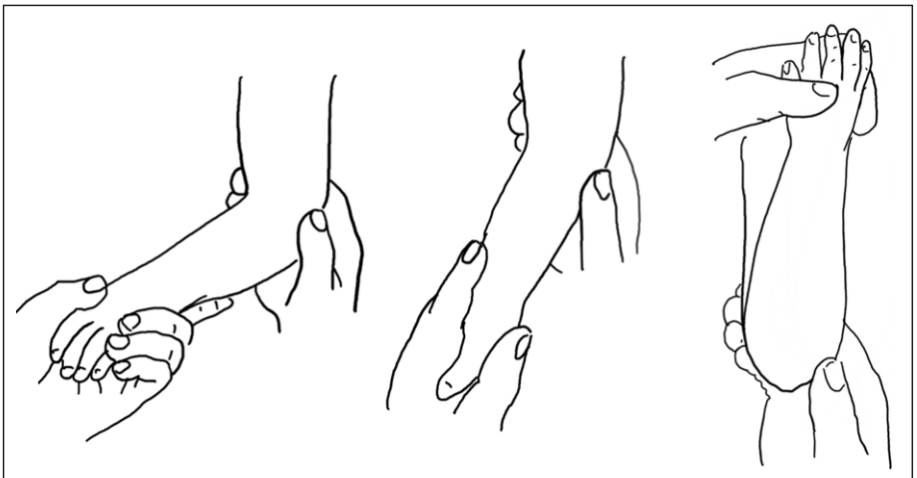

Figure 2: Two maneuvers for reducing a pulled elbow – hyper-pronation and supination and flexion (Illustration by Dr. Hirva Manek).

Reduction

Pulled elbow can be reduced in the clinic without any special requirement. As it is a quick procedure with immediate relief from pain, no sedation or pain medication is required before or after the maneuver. With the child comfortable in the parents' lap, a gentle combined elbow flexion and forearm supination maneuver is carried out till the end of range with a thumb over the radial head. A pop of reduction is felt with immediate relief of the pain in the child. The active movement will start by the child in a while as the child realizes the relief from pain. Many times, a repeat maneuver is required when the reduction does not happen at the first attempt. More than 3 attempts are usually an indication for further evaluation. [1,2].

There has been lot of literature support for hyper- pronation maneuver for reducing the pulled elbow with some studies proving it more efficient for reduction of pulled elbows in the first attempt .[3]. In this instead of supinating the forearm, a thumb is kept over the radial head and forearm is completely pronated to more than the entire normal range. Though Although the supination maneuver is widely used and taught, hyper- pronation maneuver has been found to be more effective in studies. (Figure .2).

After reduction, the child may be allowed to play in the clinic till active movements resume to the parents' contention. There is no follow- up visit required for a pulled elbow, however, the parents may be taught about the precautions for prevention by explaining the mechanism for occurrence.

There are high chances of follow- up incidence of a pulled elbow in the same child with literature quoting incidence from 27% to 39% .[3, 4, 5, -6]. This should be explained to the parents at the first visit itself as a repeat occurrence may alarm them. Pulled elbow in isolated incidence or recurrent episode has no long- term affection to the elbow joint of the child which should be explained to the worried parents.

Recent Advances

Ultrasonographic studies have been carried out in the child presenting to the emergency with symptoms suggestive of pulled elbow. They've confirmed the annular ligament slippage as the causative factor in pulled elbows. Tear of the annular ligament have has been found in studies performing ultrasonography immediately following reduction .[7]. However, no routine sonography is warranted for this benign condition which has no long- term sequalaesequelae. [8].

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the Journal. The patient understands that his name and initials will not be published, and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

Conflict of Interest: NIL; **Source of Support:** NIL

References

1. Hanes L, McLaughlin R, Ornstein AE. Suspected radial head subluxation in infants: The Need for radiologic evaluation. Pediatr Emerg Care 2021;37:e58-9.
2. Krul M, van der Wouden JC, Kruithof EJ, van Suijlekom-Smit LW, Koes BW. Manipulative interventions for reducing pulled elbow in young children. Cochrane Database Syst Rev 2017;7:CD007759.
3. Guzel M, Salt O, Demir MT, Akdemir HU, Durukan P, Yalcin A. Comparison of hyperpronation and supination-flexion techniques in children presented to emergency department with painful pronation. Niger J Clin Pract 2014;17:201-4.
4. Schunk JF. Radial head subluxation: Epidemiology and treatment of 87 episodes. Ann Emerg Med 1990;19:1019-23.
5. Teach SJ, Schutzman SA. Prospective study of recurrent radial head subluxation. Arch Pediatr Adolesc Med 1996;150:164-6.
6. Quan L, Marcuse EK. The epidemiology and treatment of radial head subluxation. Am J Dis Child 1985;139:1194-7.
7. Kosuwon WE, Mahaisavariya BA, Saengnipanthkul SU, Laupattarakasem WI, Jirawipoolwon PO. Ultrasonography of pulled elbow. J Bone Joint Surg 1993;75:421-2.
8. Pring M, Wenger D, Rang M. Elbow-proximal radius and ulna. In: Rang M, Wenger DR, Pring ME, editors. Rang's Children's Fractures. 3rd ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2005. p. 119.

Conflict of Interest: NIL
Source of Support: NIL

How to Cite this Article

Shah S, Agashe M. Managing a Pulled Elbow in the Clinic. Journal of Clinical Orthopaedics Jul-Dec 2022;7(2):12-14.