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Nursemaid elbow: Elbow subluxation

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Abstract
Nursemaid's elbow is a radial head subluxation caused by axial traction on the extended arm while the forearm is pronated, allowing for slippage of the radial head. A 2-year-old boy presented with pain, swelling and reduced range of movement of the right elbow for 4 days. The mother noted that the child was moving the right upper limb less often and there was tenderness over the right elbow. X-ray of the right elbow showed subluxation of the elbow joint with no obvious fracture. A trial of conservative management was decided upon and the patient was placed on a right elbow back slab with the right forearm in a supine position. On follow-up, there was no swelling, tenderness or neurological deficit noted. A repeat x-ray revealed normal findings.

Keywords: Nursemaid's elbow, radial head subluxation, extended arm, pronated forearm

Introduction: Background

Nursemaid elbow, also known as "Radial head subluxation" or simply "pulled elbow", is the most common upper-limb injury in children under the age of 6. It is typically an easily treatable condition. Correct diagnosis is the primary challenge to the physician.

Definition of Nursemaid's Elbow

Nursemaid's elbow means the elbow has slipped out of its normal place at the joint.

The elbow bone (Radius) is connected to the elbow joint (Humerus) by elastic bands called ligaments. These ligaments grow stronger and tighter as a child grows older. In little kids and babies, the ligaments are still loose. This makes it easy for the elbow to slip out of place. Other terms for nursemaid's elbow, such as:

- Pulled elbow
- Radial head subluxation

Anatomy

The elbow is made up of the upper arm bone (humerus) and the two bones in the forearm (radius and ulna).

On the inner and outer sides of the elbow, strong ligaments hold the elbow joint together and work to prevent dislocation.

There are two joints in the elbow:

- The humeroulnar joint between the ulna and humerus allows for bending of the elbow.
- The radiocapitellar joint, made up of the radius and part of the humerus, allows for rotation of the forearm so that the hand can be turned palm up or palm down.

The radiocapitellar joint is involved in nursemaid's elbow.

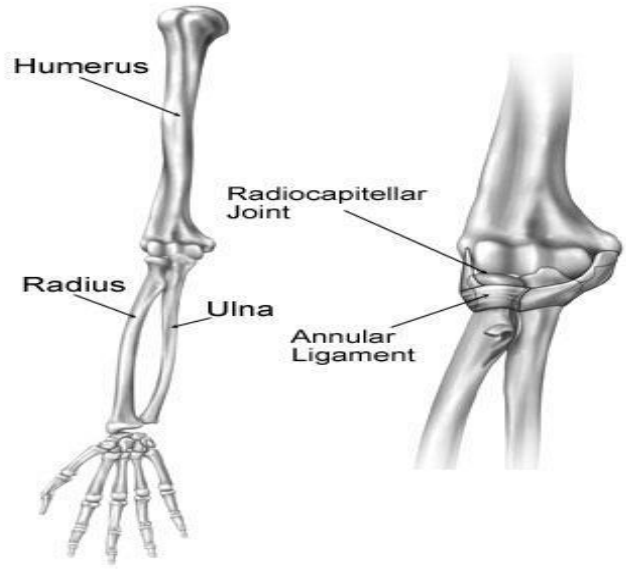

Fig 1: (Left) The bones of the elbow and forearm shown with the palm facing forward. (Right) The ligaments of the elbow. In young children, the annular ligament may be weak, making it easier for the radius to slip out of place.

Description

Nursemaid's elbow occurs when there is a partial separation of the radiocapitellar joint. Because a young child's ligaments—the strong tissues that attach bones to each other—are not fully formed, even a mild force on the joint may cause it to shift, or partially dislocate.

The annular ligament surrounds the radius and may be particularly loose in some young children, which may lead to nursemaid's elbow recurring over and over again.

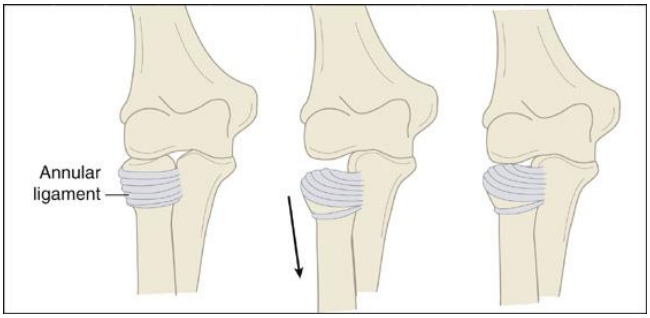

Fig 2

Epidemiology

- Most common in children from 1 to 4 years of age
- Average age is 28 months
- Rare after 5 years of age
- Slightly more common in females

Pathophysiology

The etiology is movement of the head of the radius under the annular ligament. The distal attachment of the annular ligament covering the radial head is weaker in children than in adults, allowing it to be more easily torn. As children age, the annular ligament strengthens. In children over the age of 5, subluxation of the radial head is prevented by a thicker and stronger attachment between the annular ligament and the periosteum of the radial neck [2]. As a result, nursemaid's elbow occurs less often.

A Nursemaid's Elbow (NE) is a low-energy trauma often occurring from brisk axial traction of the forearm, often by an adult who holds the child's hand as the child pulls away. Other causes of injury include falls, wrestling, and abuse [3].

The oval shape of the proximal radius in cross-section contributes to this condition by offering a more acute angle posteriorly and laterally, with less resistance to slippage of the ligament when axial traction is applied to the extended and pronated forearm. The common belief that nursemaid elbow is due to children having a radial head smaller than the radial neck is incorrect.

Causes of Nursemaid's Elbow

Nursemaid's elbow (also called pulled elbow) usually happens in kids 1 to 4 years old. Their ligaments (the elastic-like bands that hold bones together) are a bit loose. So it can be easy for a ligament in the elbow to slip into the joint and get stuck.

Nursemaid's elbow can happen with just a small amount of force.

- **Pulling a child up by the hands** can put stress on the elbows. Never pick up a toddler or infant by the hands or wrists, but lift under the armpits.
- **Swinging a toddler** by holding the hands or wrists can put stress on the elbow joint and should be avoided.
- **Jerking an arm** when pulling a toddler along or quickly grabbing his or her hand can make the ligament slip. Always be gentle when taking a child by the hand.
- **Breaking a fall** by reaching an arm out for protection can overextend the elbow, causing the ligament to slip.
- **Rolling over in an awkward way** in a crib, bed, or on the floor can cause nursemaid's elbow in infants and very young children.

Signs and Symptoms

A child with nursemaid's elbow will not want to use the injured arm because moving it is painful. He or she will keep the arm in a straight position or with a slight bend in the elbow. The injury won't be obvious because nursemaid's elbow doesn't cause deformity or swelling.

An arm or elbow injury that causes severe pain might be a sign of an elbow fracture (broken bone) or a bad bruise. It can be hard for a parent to tell whether an injury is nursemaid's elbow or a fracture, so it's important to call your doctor if your child has injured an elbow.

Assessment

- **History**
  - A click may be heard or felt by the person pulling the child's arm.
- **Symptoms**
  - Child refuses to use the affected limb
  - Holds the elbow in slight flexion and the forearm pronated
  - Physical Exam
  - Pain and tenderness localized to the lateral aspect of the elbow
  - Range of motion
  - Full flexion and extension
  - Pain with supination

Imaging

- **Radiographs**
  - Not required in the setting of the classic presentation of
  - History of traction injury
  - Child five years or younger
  - Consistent clinical exam
  - When obtained, elbow radiographs are normal
  - 25% will show radiocapitellar line slightly lateral to center of capitellum
- **Ultrasound**
  - Indications
  - Helpful for confirming the diagnosis when necessary
  - When the mechanism of injury is not evident
  - When physical examination is inconclusive
  - Benefits
  - No radiation to the patient
  - Can visualize soft tissues
  - Findings
  - Increase echo-negative area between capitellum and radial head
  - Sensitivity 64.9% and specificity 100%.

Differential Diagnosis

- Nursemaid elbow is a diagnosis of exclusion
- Differential diagnosis of a painful elbow with limited supination
- Traumatic causes

- Supracondylar fracture, olecranon fracture, radial neck fracture, lateral condyle fracture
- Contusion
- Infection
- Septic arthritis
- Congenital
- Radial head dislocation
- Forearm synostosis

Treatment

In most cases of nursemaid's elbow, the doctor will gently move the bones back into normal position. The medical term for this procedure is "reduction."

Nonoperative

- **Closed reduction of annular ligament subluxation.**
  - Indications
  - For majority of cases
  - Must be certain no fracture is present prior to any manipulation
  - Operative
- **Open reduction rarely required**
  - Indications
  - For chronic, symptomatic subluxations that cannot be reduced.

Techniques

Closed reduction of annular ligament subluxation

- Supination Technique
  - While holding the arm supinated the elbow is then maximally flexed
  - The physician’s thumb applies pressure over the radial head and a palpable click is often heard with reduction of the radial head.
- Hyper pronation Technique
  - Involves hyper pronation of the forearm while in the flexed position.
- Follow-up
  - Child should begin to use the arm within minutes after reduction
  - Immobilization is unnecessary after first episode.

Prevention

- Avoid pulling a child’s wrists or hands abruptly.
- Avoid swinging a child by their hands or wrists.
- If a child pulls you in one direction, do not pull them back toward you.
- Always lift children up by their armpits and not by their hands or wrists.

References

1. Browner EA. Nursemaid’s elbow (annular ligament displacement). Pediatr Rev. 2013; 34(8):366-367.
2. Browner EA. Nursemaid's Elbow (Annular Ligament Displacement). Pediatrics in Review. 2013; 34 (8):366-7, discussion 367. doi:10.1542/pir.34-8-366. PMID 23908364
3. Bexkens R, Washburn FJ, Eygendaal D, van den Bekerom MP, Oh LS. Effectiveness of reduction maneuvers in the treatment of nursemaid's elbow: A systematic review and meta-analysis. The American Journal of Emergency Medicine. 2016; 35(1):159-163.
4. Eismann EA, Cosco ED, Wall EJ. Absence of Radiographic Abnormalities in Nursemaid’s Elbow. J Pediatr Orthop. 2014; 34(4):426-31.
5. Vitello S, Dvorkin R, Sattler S, Levy D, Ung L. Epidemiology of Nursemaid's Elbow. West J Emerg Med. 2014; 15(4):554-7.
6. Wong K, Troncoso AB, Calello DP, Salo D, Fiesseler F. Radial Head Subluxation: Factors Associated with Its Recurrence and Radiographic Evaluation in a Tertiary Pediatric Emergency Department. J Emerg Med. 2016; 51(6):621-627.
7. Carrigan RB. The upper limb. In: Kliegman RM, Stanton BF, St. Geme JW, Schor NF, eds. Nelson Textbook of Pediatrics. 20th ed. Philadelphia, PA: Elsevier, 2016, 681.
8. Deeney VF, Arnold J. Orthopedics. In: Zitelli BJ, McIntire SC, Norwalk AJ, eds. Zitelli and Davis' Atlas of Pediatric Physical Diagnosis. 7th ed. Philadelphia, PA: Elsevier, 2018, 22.