Nursemaid's Elbow (Radial Head Subluxation)

Normally the annular ligament helps hold the head of the radial bone in the forearm in place at the elbow joint. Nursemaid's elbow, also called pulled elbow, is the most common elbow injury in children. It occurs when the radial head moves inferiorly under the annular ligament in a process known as radial head subluxation. Any form of axial traction on the forearm, such as a child being tugged or swung by the distal arms, may cause this injury. Children are most likely to experience this injury and will present with an extended and pronated forearm that they refuse to bend at the elbow. This type of injury can be manually reduced using either a technique of gentle supination of the elbow with 90 degrees flexion or hyperpronation of the forearm. Immobilization should never be used to treat this injury.



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Pathophysiology

Radial Head Subluxation
Radio Head Sub
A subluxation is a partial dislocation, so patients with Nursemaid's elbow have a partial dislocation of head of the radius. The head of the radius normally articulates with the lateral side of the humerus at the capitulum, and is held in place with the radial notch of the ulna by the annular ligament. Particularly in children, if the hand is pulled on with enough force, it can cause the head of the radius to be displaced underneath the annular ligament, resulting in the inability to supinate the arm and experience pain.

Inferiorly Under Annular Ligament
Inferiorly In-fur and Annular-ring Ligament
If a patient with Nursemaid's elbow is standing in anatomical position, the proximal head of the radius will be inferiorly displaced, or "below" the annular ligament. It is also not uncommon for the radial head to be subluxed (partially dislocated) downward, and then for the radial head to move to the side (laterally) next to the annular ligament, resulting in a subluxation and a dislocation.

Axial Traction on Forearm
Axe Tractor and Forearm
Axial traction refers to outward movement away from the body. Any type of pulling force on the hand or distal arm, such as forcefully tugging a child's hand, may cause this injury.

Pulled or Lifted by the Hand or Forearm
Pulling on Forearm
Any type of pulling force on the distal arm, such as pulling a child up by the hands, forcefully pulling or jerking a child's hand, or playfully swinging the child by their arms, may cause this injury.

Children Aged (1-4 Years Old)
Child
This injury occurs most commonly in children of preschool age, which is usually one to four years old. Older children are at a decreased risk because their joints, and the ligaments surrounding them are stronger, and older children are less likely to be in a situation where this injury might occur.

Signs & Symptoms

Extended & Pronated Forearm
Extended Pronated-primate Forearm
Radial articulation with the humerus allows for forearm supination and flexion; thus, when the radial head is displaced, the child will be unable to perform these motions, and their arm will be extended and pronated. However, the elbow may be slightly flexed and pronated as well.

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Refusal to Bend Elbow

Refusing to Bend Elbow

Bending of the elbow may generate pain, so patients may hold their arm to their side. However, nursemaid's elbow does not commonly cause localized swelling or deformity unlike other forms of trauma to the elbow joint.

Treatment

Manual Reduction

Manually Reducing

There are two techniques that can be performed by a provider to manually reduce the dislocated joint: supination of the elbow at 90 degrees flexion and hyperpronation of the forearm.

Hyperpronation of Forearm

Hiker-pronated-primate with Forearm

While applying direct pressure with one finger on one hand on the radial head, the provider grips the child's forearm with his other hand, and hyperpronates the forearm until the radial head clicks back into place.

Gentle Supination of Elbow at 90 Degrees Flexion

Soup and Elbow with 90 Degree-angle

Using the thumb on one hand to hold the elbow and apply pressure on the radial head, the provider then supinates the patient's hand and forearm, and then flexes the elbow to 90 degrees. This supination, followed by 90 degree flexion, aims to guide the radial head back in the annular ligament in its proper position.

No Immobilization

No Immobilization Sign

If nursemaid's elbow can be successfully reduced, further treatment is not needed. The child often experiences immediate pain relief after manual reduction, and normal activity can be resumed shortly after.

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