

Pediatric Radial Head Subluxation: A Review and Comparative Analysis of Reduction Methods to Breaking the Lock and Restoring Mobility

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Abstract

Nursemaid's elbow, characterized by subluxation or slipping of the radial head, is a common injury in the pediatric population. This article provides a comprehensive overview of the epidemiology, pathophysiology, and clinical presentation to help diagnose the nursemaid's elbow; it also critically evaluates various methods for reducing radial head subluxation, comparing their efficacy. This review aims to provide clinicians with a better understanding of the nursemaid's elbow and help them to make informed decisions regarding the most appropriate method for treating this condition in their pediatric patients.

Keywords

Nursemaid's elbow, pediatric radial head subluxation, pediatric elbow subluxation, pulled elbow, pediatric orthopedics, annular ligament displacement, nursemaid's elbow reduction, hyperpronation technique, supination-flexion technique

Introduction

Radial head subluxation, or pulled elbow, is a common injury in the pediatric orthopedic department accounting for about 20% of all upper limb injuries in children. It is caused by a sudden pull on the forearm in the axial plane, which causes the head of the radius to slip out of its anatomical position inside the annular ligament. It results in acute onset of pain in the forearm of the child, causing reduced mobility of the affected arm. Diagnosis is usually made by history and physical examination, and imaging is generally not required. Treatment includes closed reduction of the subluxated radial head by supination-flexion or hyperpronation. The majority of the children report immediate recovery with either of these methods and

to the elbow, or mechanisms that include rolling over the elbow [5].

The nursemaid's elbow can be reduced in an outpatient setting at the pediatric office without sedatives. Two commonly described methods for reducing the radial head are supination-flexion and hyperpronation, with the latter, reported to have more success rate and less pain. However, if the hyperpronation fails, supination with flexion can be attempted. To perform the supination-flexion maneuver, hold the child's elbow with one hand. Next, apply gentle pressure to the head of the radius bone with your thumb. Using your other arm, gently rotate the child's forearm to supinate it while flexing the elbow joint to its fullest extent. To perform the hyperpronation maneuver, hold the child's elbow with one hand. Then, apply moderate pressure on the head of the radius bone. Using the other arm, hyperpronate the child's forearm. This technique can effectively correct the subluxation of the radial head and restore mobility to the affected arm [2].

Several studies concluded that the hyperpronation method of reducing the subluxated radial head is more effective and has higher success rates than the supination-flexion method at the first attempt, second attempt, and as an alternate when the latter method failed [6,7,8].

To reduce the risk of recurrence of nursemaid's elbow in children, parents or caretakers must be educated to limit the causative actions, including sudden pulling of the arm, trying to swing the child with their hands, and lifting the child with their wrist [3]. Sometimes, in children with recurrent episodes of subluxation, the parents learn to reduce the radial head and successfully perform it at home.

have a good prognosis without any long-term complications. Still, recurrence is common in about 20% of cases. Parents or caregivers must be educated on how to prevent it in the future.

Discussion

In the vibrant world of pediatric medicine, the term 'nursemaid's elbow' reigns supreme as a common injury amongst the sprightly youth under the age of seven, with peak occurrence between the age of two to three years. Of all the pediatric upper limb injuries, it constitutes about 20% [1,2]. It is slightly more common in females with the laterality to the left, and the recurrence rate is about 20% [2]. This condition, also known as subluxation or partial dislocation of the head of the radius, manifests as a disruption to the delicate balance of the forearm caused by a bold and forceful longitudinal push. The resulting displacement of the head of the radius from its anatomic position within the annular ligament brings forth an array of discomforts, including the abrupt onset of pain and reduced arm mobility [1].

The annular ligament, composed of a durable collagenous structure, has a ring-like shape attached to the proximal part of the ulnar head. It encircles and stabilizes the head of the radius bone at the elbow. Any sudden axial traction on the prone forearm with the elbow extended results in slippage of the head of the radius from inside the annular ligament. The ligament becomes entrapped in the joint between the radius and humerus. This causes the child to be unable to supinate the forearm; they keep the forearm in a mid-prone position close to the chest, with the elbow mainly extended and supported with the opposite hand. The child will not cry at rest, but when the arm is tried to be manipulated, they will resist any movement because of pain [2,3].

A comprehensive history should involve a complete description of the events that led to this injury. A complete physical examination, including looking for any signs of trauma, swelling, bruises, or deformities, should be performed. It should entail a thorough evaluation of the arm, from the shoulder to the hand, checking neurovascular status and any tenderness to palpation. The fracture must be ruled out. Imaging is generally not warranted, and unnecessary imaging should be discouraged unless it is a traumatic injury or the mechanism of injury is not typical [2,3,4]. Other subluxation methods, including a non-axial force, are also described, including a history of a fall, a direct hit

Conclusion

Nursemaid's elbow, or subluxated elbow, is a frequent injury seen in pediatric patients which can be treated by a closed reduction of the radial head without any need for sedation. Of the two commonly practiced reduction methods, the hyperpronation method is more effective than the supination-flexion method. Patient education is necessary to prevent a recurrence. There needs to be a comprehensive study of the causative mechanisms of injury, its characteristics, and a comparative analysis of the reduction methods in regard to pain during the procedure so that clinicians can make informed decisions and guide the parents appropriately regarding its prevention.

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