

Functional Outcome of Monteggia Fracture Treated with Conservative Treatment in a Paediatric Child: A Case Report

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Learning point of the article: In this article, we explained about the consequence of conservative and surgical management of Monteggia fracture in paediatric age patient

Abstract: ***Background:** Monteggia fractures, characterized by a proximal ulna fracture with radial head dislocation, are rare in pediatric patients but present significant diagnostic and treatment challenges. These fractures can be complicated by nerve injuries such as posterior interosseous nerve (PIN) palsy. **Case Presentation:** A 12-year-old male sustained a Monteggia fracture with posterior radial head dislocation and subsequently developed PIN palsy after initial conservative management. Under general anesthesia, closed reduction of the radial head was successfully performed, and the forearm was immobilized in a long-arm cast. One month later, the patient exhibited thumb and finger drop. Neurological examination confirmed PIN palsy. **Management:** The patient underwent intensive physiotherapy, including range of motion exercises, strengthening exercises, and electrical stimulation, along with medical management including steroids and neurotrophic drugs. Regular follow-ups were conducted to monitor fracture healing and nerve recovery. **Outcomes:** At three months, the patient showed significant improvement in elbow range of motion and finger and thumb extension. By six months, nearly full function of the affected limb was regained with minimal residual weakness. **Conclusion:** This case highlights the importance of early diagnosis and appropriate management of Monteggia fractures in children. Conservative treatment, including closed reduction, cast immobilization, and comprehensive physiotherapy, can result in favorable outcomes even in cases complicated by nerve injuries such as PIN palsy. Early intervention and targeted rehabilitation are crucial for optimal recovery and function.*

Keywords: Monteggia fracture, closed reduction, PIN palsy.

1. Introduction

Monteggia fractures, though uncommon in children, were described by Giovanni Monteggia in the nineteenth century as a proximal ulna fracture with radial head dislocation [1 - 4]. Bado later classified these fractures into four types based on radial head dislocation direction [5 - 7]. These injuries, caused by trauma, hyperpronation, or hyperextension, account for 1.5% to 3% of childhood elbow injuries and are challenging to diagnose and treat, particularly when radial head dislocations are missed [3]. Type I (59%) and type III (26%) are the most common [8 - 10]. Distal forearm fractures are frequent in children, making up 32.9% of fractures, but concurrent elbow and wrist fractures are rare. The anterior interosseous nerve (AIN) and posterior interosseous nerve (PIN) can be injured in elbow trauma, with PIN palsy being most common due to radial head dislocation [11]. Proper treatment aims for stable reduction of the fractures. Non-

surgical methods like closed reduction and cast immobilization are often effective, but open reduction and fixation may be necessary. With appropriate management, nerve recovery and clinical outcomes are generally excellent for pediatric patients [12 - 15]. This case report details the presentation, closed reduction, and subsequent management of a 12-year-old child who developed PIN palsy following a Monteggia fracture and achieved a good functional outcome through conservative treatment and physiotherapy.

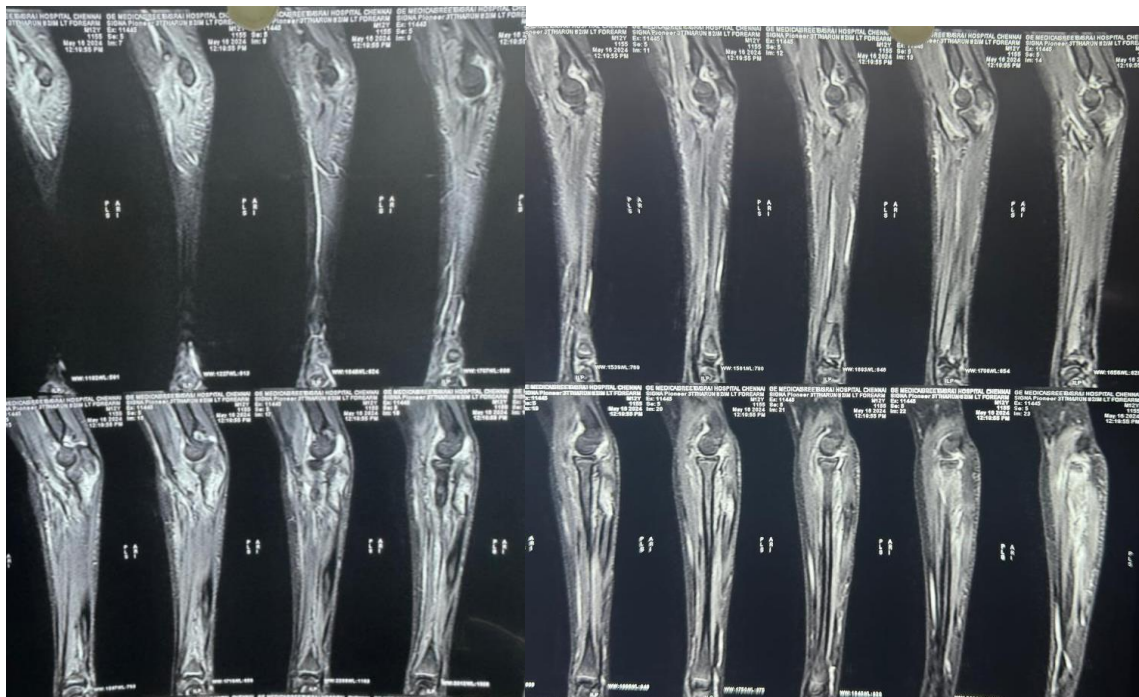
2. Case Report

A 12-year-old male presented with a painful, swollen left elbow following a fall from a bike. The initial examination revealed tenderness and limited range of motion in the left elbow and forearm. Radiographs confirmed a Monteggia fracture with an posterior dislocation of the radial head (Bado type 2).



Under general anesthesia, a closed reduction of the radial head dislocation was attempted and successfully achieved. The forearm was immobilized in a long - arm cast to maintain reduction and allow for healing of the ulnar fracture. After

one month, upon presentation to the orthopedic clinic, the slab was removed and patient exhibited with thumb and finger drop present.



Neurological examination revealed weakness in extending the fingers and thumb at the metacarpophalangeal joints, consistent with PIN palsy. Sensory function was intact, and wrist extension was preserved. The diagnosis was a Monteggia fracture with associated PIN palsy, likely resulting in neuropraxia due to compression or traction on the nerve. Patient was admitted for further investigation and management. Initially MRI of left forearm was taken followed by nerve conduction study was advised. Patient is started on steroids (tab. MEDROL 4mg) and tab. Renvex plus. Intensive physiotherapy was initiated to address the PIN palsy. The regimen included: (a) Range of Motion Exercises: Gentle, passive, and active range of motion exercises for the elbow, forearm, wrist, and fingers to prevent stiffness and improve mobility; (b) Strengthening Exercises: Focused on the extensor muscles of the fingers and thumb to gradually restore motor function; (c) Electrical Stimulation: To enhance

muscle contraction and promote nerve recovery. Regular follow - up appointments were scheduled to monitor the healing of the fracture, the stability of the radial head, and the progress of nerve recovery.

3. Discussion

At the three - month follow - up, radiographs showed good alignment and healing of the ulnar fracture with maintained reduction of the radial head. Clinically, the patient demonstrated significant improvement in elbow range of motion and strength in finger and thumb extension [16]. By six months, the patient had regained nearly full function of the affected limb with minimal residual weakness in the extensor muscles. This case highlights the complexity of managing Monteggia fractures, particularly when initial treatment is delayed or inadequate. Early recognition and appropriate

management are crucial to prevent complications such as nerve palsy. Conservative treatment, including closed reduction and cast immobilization, followed by targeted physiotherapy, can lead to favorable outcomes even in cases complicated by nerve injury.

4. Conclusion

In this case, a 12 - year - old child with a Monteggia fracture complicated by posterior interosseous nerve palsy achieved a good functional outcome through conservative management and physiotherapy. This underscores the importance of early intervention and comprehensive rehabilitation in pediatric patients with Monteggia fractures to ensure optimal recovery and function.

Clinical message:

Source of Finance - NIL

Consent - Consent of the patient has been taken so that his photo and details can be published in the case report.

Competing Interests - Authors declare that there is no competing interest.

Acknowledgements - NIL.

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