



ELBOW DISLOCATION WITH IPSILATERAL DIAPHYSEAL BOTH-BONE FOREARM FRACTURE: A CASE REPORT

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ABSTRACT

Elbow dislocations accompanied by ipsilateral both-bone forearm fractures are rare and complex injuries that require prompt diagnosis and appropriate management. This case report presents a detailed account of a 22-year-old male who sustained an elbow dislocation with an ipsilateral both-bone forearm fracture on the left side. The purpose of this report is to describe the clinical presentation, diagnostic evaluation, treatment approach, and outcomes of this unique case. The report emphasizes the importance of a comprehensive assessment and multidisciplinary management for optimal functional recovery in such complex injuries.

KEYWORDS : Elbow dislocation, Ipsilateral, Diaphyseal, Both-bone forearm fracture**INTRODUCTION**

Elbow dislocations are relatively common orthopaedic injuries, accounting for approximately 10% of all dislocations in adults. However, concurrent ipsilateral both-bone forearm fractures are relatively rare. The combination of these injuries presents a challenging clinical scenario that requires careful evaluation and appropriate management to achieve satisfactory outcomes. Elbow dislocations are often caused by a significant force applied to the outstretched arm, resulting in a disruption of the stabilizing structures of the elbow joint. The most common mechanism of injury is a fall onto an outstretched hand, with the elbow in an extended position. This places excessive stress on the joint, leading to ligamentous disruption and potential fractures. The radial head is the most commonly fractured structure in elbow dislocations, followed by the coronoid process and olecranon.

Ipsilateral both-bone forearm fractures accompanying elbow dislocations pose additional challenges due to the complexity of managing multiple fractures in close proximity. The combination of elbow dislocation and forearm fractures is often the result of high-energy trauma, such as motor vehicle accidents or falls from a significant height. The forearm fractures can occur at different levels, involving the radius and ulna in various patterns, including isolated fractures or combinations of shaft fractures, radial head fractures, or Monteggia-like fractures.

The clinical presentation of elbow dislocation with ipsilateral both-bone forearm fractures is characterized by severe pain, swelling, and deformity at the elbow joint and forearm. The patient may exhibit an obvious deformity, and there may be visible swelling and tenderness. Neurovascular status should be assessed promptly to rule out any compromise of the brachial artery or median, ulnar, and radial nerves. Radiographic evaluation, including anteroposterior and lateral views of the elbow and forearm, is essential for confirming the diagnosis and assessing the extent of the injuries.

Treatment of elbow dislocations with ipsilateral both-bone forearm fractures requires a comprehensive approach that addresses the instability of the elbow joint and restores the alignment and stability of the fractured forearm bones. The initial management involves closed reduction of the dislocated elbow joint under anaesthesia, followed by appropriate immobilization. The management of forearm fractures depends on the fracture pattern, associated soft tissue injury, and the surgeon's preference. Surgical options include open reduction and internal fixation using plates and screws, intramedullary nailing, or external fixation.

Postoperative rehabilitation plays a vital role in the recovery process. Physical therapy is initiated to restore range of motion, strengthen the surrounding musculature, and improve functional abilities. The duration and intensity of the rehabilitation program depend on the severity of the initial injury, the surgical technique employed, and the patient's progress.

Case Report

A 22-year-old male presented to the emergency department with severe pain, swelling, and deformity in his left elbow and forearm following a fall from a height. He reported landing on his outstretched hand, resulting in a sudden hyperextension injury to the elbow. On examination, there was an obvious deformity at the elbow joint, with marked swelling and tenderness. The forearm exhibited pain, swelling, and crepitus. Distal neurovascular status was intact. Radiographs confirmed a posterior dislocation of the left elbow joint, along with fractures involving both the radius and ulna in the ipsilateral forearm.

Initial radiographic evaluation included anteroposterior and lateral views of the left elbow and forearm. These images demonstrated a posterior dislocation of the left elbow joint, with both-bone forearm fractures. Additional imaging, such as computed tomography or magnetic resonance imaging, was not deemed necessary in this case due to the clear visualization of the injuries on plain radiographs. Laboratory investigations, including complete blood count and coagulation profile, were performed to assess the patient's overall health status and rule out any underlying haematological abnormalities.

The patient was promptly transferred to the operating room for closed reduction of the elbow dislocation under sedation. With the aid of intraoperative fluoroscopy, gentle traction and manipulation were performed, followed by manual reduction of the elbow joint. Although closed reduction of the elbow joint was successful, it was found to be unstable. Post-reduction radiographs confirmed the anatomical alignment of the elbow joint. The next step involved the management of both-bone forearm fractures. Due to the significant instability of the forearm fractures, surgical intervention was required. Careful attention was paid to restoring the length, alignment, and rotational stability of both the radius and ulna. Open reduction and internal fixation of the radius was done with a 7-hole 3.5 mm small fragment dynamic compression plate using the dorsal approach. Similarly, the ulna was fixed with an 8-hole 3.5 mm small fragment dynamic compression plate using the dorsal approach. The elbow joint was then fixed with a K-wire inserted from the olecranon to the humerus. The wound was closed in layers, and an above-elbow slab was applied for immobilization. Post-operative radiographs demonstrated a satisfactory reduction of the fractures and the elbow dislocation.

Following surgery, the patient received appropriate analgesia and was educated on proper immobilization techniques and the importance of maintaining regular follow-up appointments. Three weeks later, the above-elbow slab was removed along with the K-wires and a gradual passive range of motion exercise was initiated under the supervision of a physiotherapist. At six weeks post-operatively, radiographs showed adequate healing of the fractures, allowing the initiation of a progressive strengthening program. The patient continued to undergo regular physical therapy sessions for the subsequent six months to restore the full range of motion, strength, and functional abilities. At the final follow-up, nine months after the initial injury, the patient

achieved satisfactory functional outcomes with no residual pain, instability, or limitation in daily activities.

DISCUSSION

The elbow joint is a complex hinge joint located in the upper extremity that is composed of three bones: the humerus, radius, and ulna. The joint allows for flexion and extension of the forearm, as well as pronation and supination of the hand.

The bony anatomy of the elbow joint consists of the trochlea of the humerus, which articulates with the trochlear notch of the ulna, forming the hinge joint. The radial head articulates with a depression on the lateral side of the humerus, called the capitulum, forming the pivot joint for rotation. These bony articulations, along with the surrounding ligaments and muscles, contribute to the stability and movement of the elbow joint.

Elbow dislocation with forearm fracture typically occurs due to a forceful impact or fall onto an outstretched hand, causing a combination of axial loading, rotational forces, and shearing forces on the forearm and elbow joint. The specific mechanism may vary, but the injury generally involves a combination of the following factors:

- 1) **Axial Loading:** The impact or force applied to the hand is transmitted through the forearm bones, resulting in fractures of the radius and ulna. The magnitude and direction of the force can determine the type and pattern of the fractures.
- 2) **Rotational Forces:** Rotational forces can cause the bones of the forearm to twist or torque, leading to fractures. These rotational forces can be a result of the impact itself or the attempt to resist or cushion the impact.
- 3) **Shearing Forces:** Shearing forces occur when opposing forces are applied to the forearm bones, causing them to slide or separate. These forces can contribute to the dislocation of the elbow joint and the associated fractures.

Following the dislocation of the elbow, the forearm may experience significant forces and stresses, especially if the person tries to break the

fall or brace themselves with an outstretched hand. These forces can lead to fractures in the forearm bones. The fractures can occur at different levels along the bones, including the distal, mid-shaft, or proximal regions. In some cases, the forearm fracture may occur simultaneously with the elbow dislocation. This can happen if the forces applied to the forearm during the injury are severe and result in both injuries occurring simultaneously. However, it is more common for the elbow dislocation to happen first, followed by the forearm fracture. Also, since the force required to produce elbow dislocation cannot be transported up to the elbow once the forearm bones have been broken, the likelihood of the process being reversed is extremely low.

By presenting this case, we hope to contribute to the existing literature and enhance the understanding of clinicians regarding the assessment and management of similar cases in the future.

CONCLUSION

The simultaneous occurrence of elbow dislocation and ipsilateral diaphyseal both-bone forearm fracture poses challenges in terms of treatment planning and surgical intervention. Once the dislocation is reduced, further evaluation is required to determine the severity and stability of the fracture. Surgical intervention may be necessary, especially in cases with unstable fractures, significant displacement, or open fractures. Postoperative rehabilitation plays a crucial role in restoring the range of motion, strength, and functional abilities of the affected arm. While the recovery process can be challenging and time-consuming, with proper medical intervention and rehabilitation, many patients can regain functional use of their arm and achieve a satisfactory outcome.

In conclusion, elbow dislocation with ipsilateral diaphyseal both-bone forearm fracture is a complex injury that requires a comprehensive and individualized approach. Timely diagnosis, appropriate treatment, and diligent rehabilitation are crucial for maximizing functional recovery and minimizing long-term complications.

Recent Reported Cases Of Elbow Dislocation With IpsilateralDiaphyseal Both-bone Forearm Fractures (After 2000)

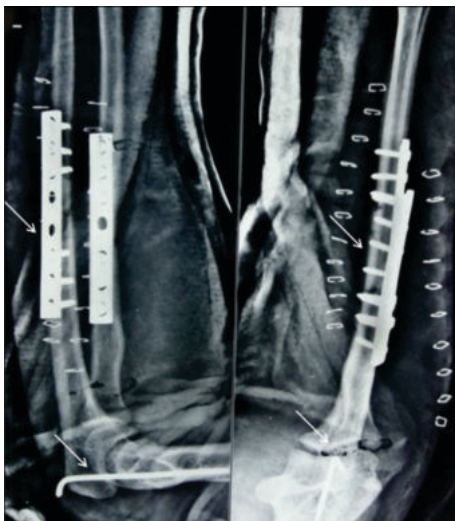
AUTHOR	YEAR	CASES	AGE/SEX	DISLOCATION	ASSOCIATED INJURY	TREATMENT
Fadili et al [1]	2021	1	37/M	Posterior	None	CR (Elbow) ORIF DCP (Radius & Ulna)
Singh et al [2]	2020	1	11/F	Posterolateral	None	CR (Elbow) CR (Radius & Ulna)
Dharmshaktu et al [3]	2019	1	9/M	Posterior	None	CR (Elbow) ORIF TENS (Radius) CRIF TENS (Ulna)
Essekkal et al [4]	2018	1	30/M	Posterior	None	CR (Elbow) ORIF DCP (Radius & Ulna)
Hassini et al [5]	2018	1	10/M	Posterior	None	CR (Elbow) CR (Radius & Ulna)
Goni et al [6]	2015	1	44/F	Posteromedial	Lateral humeral condyle #	CR (Elbow) ORIF DCP (Radius & Ulna)
Madhar et al [7]	2013	1	40/M	Posterolateral	None	CR (Elbow) ORIF DCP (Radius & Ulna)
Kumar et al [8]	2013	1	12/M	Not mentioned	Open wound Segmental BBFA # with extruded radius	CR (Elbow) ORIF K-wire (Radius & Ulna)
Prashant et al [9]	2012	1	22/M	Posterior	None	CR (Elbow) ORIF DCP (Radius & Ulna)
Rijal et al [10]	2012	1	16/M	Posterolateral	None	CR (Elbow) ORIF DCP (Radius & Ulna)
Ramesh et al [11]	2011	1	20/M	Posterior	Open wound PIN palsy Type 1 coronoid # MCL avulsion	CR (Elbow) ORIF DCP (Radius & Ulna)
Kose et al [12]	2008	1	80/M	Posterolateral	None	CR (Elbow) ORIF DCP (Radius & Ulna)
Mathur et al [13]	2005	1	12/F	Divergent	Circulatory compromise	CR (Elbow) ORIF K-wire (Radius) CR (Ulna)
Fleming et al [14]	2004	1	8/M	Posterior	Open wound	CR (Elbow) ORIF K-wire (Radius & Ulna)
Hung et al [15]	2003	1	68/F	Posterior	None	CR (Elbow) ORIF DCP (Radius & Ulna)



Pre-Reduction Radiographs



Post-Reduction Radiographs



Post-Operative Radiographs

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