



## CASE REPORT

# Comminuted Intra-Articular Fracture of the Lateral Condyle and Capitellum of the Humerus in a Young Adult: A Case Report

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### Abstract

**Introduction:** Fractures involving both the lateral condyle and capitellum of the distal humerus are uncommon in young adults and typically associated with high-energy trauma [1]. Their intra-articular nature presents challenges in achieving anatomical reduction and preventing complications.

**Case presentation:** We present a case of a 21-year-old female who sustained a comminuted displaced fracture of the lateral epicondyle and capitellum of the left humerus following a fall. CT confirmed intra-articular extension. Open reduction and internal fixation (ORIF) with two Herbert screws was performed within 24 hours. She was discharged with instructions for early active finger movement but did not undergo formal physiotherapy. At follow-up, a mild (5-10°) reduction in elbow extension was observed, with no signs of non-union, instability, or avascular necrosis.

### Keywords

Distal humerus fracture, Lateral condyle, Capitellum, Herbert screws, Open reduction internal fixation, Case report

### Abbreviations

ORIF - Open Reduction and Internal Fixation

## Introduction

Capitellar and lateral condyle fractures of the humerus are rare injuries, representing a small percentage of elbow trauma cases [2]. Their incidence in young adults is even less common, as these injuries are more often associated with osteoporotic bone in the elderly. Due to their intra-articular nature, such fractures necessitate prompt diagnosis and surgical

management to restore joint congruity and prevent complications such as stiffness, avascular necrosis (AVN), and post-traumatic arthritis [3]. This report presents a rare case of a comminuted fracture involving both the capitellum and lateral condyle in a young adult, managed successfully with open reduction and internal fixation.

## Case Description

A 21-year-old female presented with pain, swelling, and limited movement in the left elbow after a fall. Radiographs revealed a comminuted intra-articular fracture involving the lateral condyle and capitellum of the humerus (Figure 1).

She underwent ORIF with Herbert screws under general anesthesia. The surgical technique aimed at anatomical reduction and stable fixation of the fragments (Figure 2 and Figure 3).

Post-operatively, the patient was immobilized briefly, followed by gradual mobilization. Formal physiotherapy was not undertaken due to patient circumstances. At 12-month follow-up, the patient demonstrated near full range of motion with only a slight extension deficit (~5 degrees), minimal pain, and good functional outcome.

## Clinical and radiological assessment

Physical examination revealed swelling, tenderness, and limited range of motion at the left elbow. Neurovascular status was intact. A multislice 3D CT scan



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**Figure 1:** Pre-operative radiograph showing comminuted intra-articular fracture of lateral condyle and capitellum.



**Figure 4:** Clinical radiograph after 1 month and 21 days post-surgery



**Figure 2:** Post-operative radiograph showing Lateral view of the left elbow having a stable fixation with Herbert screws.



**Figure 3:** Post-operative radiograph showing Anterior Posterior view of the left elbow having a stable fixation with Herbert screws.

of the left elbow revealed a comminuted, displaced fracture of the lateral epicondyle and capitellum of the humerus with extension into the articular surface. The elbow joint and superior radio-ulnar joint remained aligned without evidence of dislocation or subluxation. Soft tissues appeared normal.

#### Surgical management

The patient underwent open reduction and internal fixation (ORIF) using two Herbert screws on 21/11/2023 under supraclavicular block. Intra-operatively, fragment reduction and fixation were successfully achieved (Figure 2 and Figure 3).

#### Post-operative care and recovery

She was discharged after 2 days with stable vitals and a good radiographic outcome. Discharge instructions included early active finger movements and oral medications for infection prevention, pain management, and bone healing.

Although physiotherapy was advised, the patient did not undergo formal physiotherapy sessions. At follow-up, a residual 5-10° limitation in elbow extension was noted compared to the contralateral side. There were no signs of non-union, infection, or AVN. The patient remained functionally independent with a satisfactory range of motion (Figure 4).

#### Discussion

Fractures involving both the capitellum and lateral condyle are rare, particularly in young adults [4]. The combination of comminution and intra-articular extension poses a challenge in achieving anatomic reduction and joint stability. Failure to manage such injuries appropriately can result in complications such as:

- Post-traumatic stiffness
- Avascular necrosis (AVN)
- Non-union
- Chronic pain or instability

Herbert screws, being headless and compressive, are ideal for such articular fragment fixation. Early surgical intervention plays a vital role in reducing long-term morbidity [3]. In this case, the patient achieved satisfactory clinical and radiological outcomes, despite not receiving structured physiotherapy. A mild limitation of 5-10° in extension was the only residual functional deficit observed at follow-up (Figure 4).

Previous reports indicate that functional outcome is closely related to:

- The quality of reduction and fixation
- Timing of intervention
- Post-operative rehabilitation

This case aligns with literature supporting early ORIF and demonstrates that even in the absence of formal physiotherapy, favorable results can be achieved with proper surgical management and adherence to post-operative advice.

This case demonstrates that early open reduction and internal fixation using Herbert screws can lead to successful outcomes in rare, comminuted intra-articular fractures of the distal humerus. Even without formal physiotherapy, the patient regained near-full function with only minor residual extension loss. Prompt diagnosis, anatomic reduction, and rigid fixation are essential to prevent long-term complications [5].

At the most recent follow-up, the patient reported no pain, instability, or difficulty with daily activities. A minor extension deficit of 5-10° was present, but overall function was satisfactory.

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## Statement of Equal Contribution

Both authors contributed equally to the preparation and review of the manuscript.

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