

# Functional Outcome of Bicolumnar Plating in Fracture of the Distal Humerus in Elderly Adult: A Case Report

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**Abstract:** *Fractures of the distal humerus are common in children compared to its incidence in adult. When they do occur, they are mostly caused by high energy trauma ,side wipe injury and fall on outstretched hand in an osteoporotic bone.<sup>1</sup> Most fractures are intraarticular type and grossly comminuted. It has been postulated that during the axial load of a direct fall on the flexed elbow, the semilunar notch of the olecranon acts as a wedge that splits the trochlea and the fracture line goes through the central groove of the trochlea and propagates proximally to the supracondylar fracture line separating the medial and lateral condyle.<sup>1,4</sup> The Functional outcome after open reduction and internal fixation of this fracture has been presented here.*

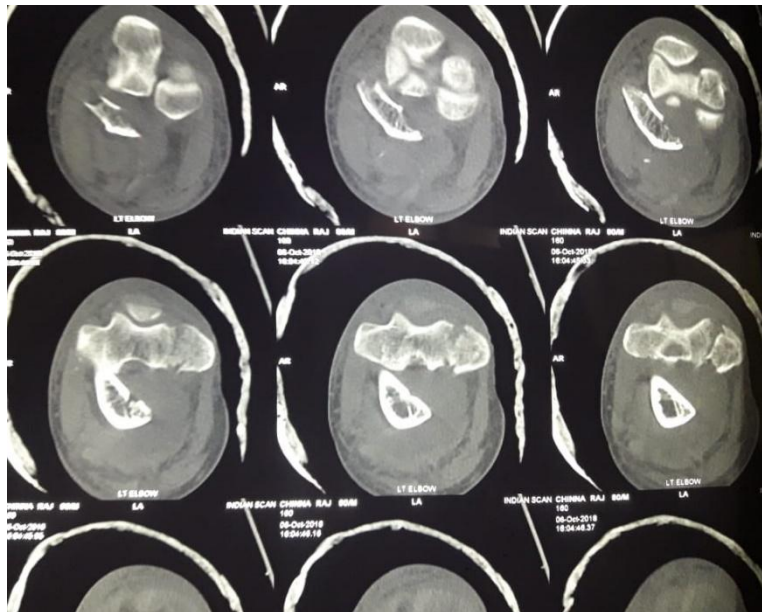
## 1. Case Presentation

A 80year-old man had fall with an outstretched hand and landed on his left elbow, resulting in painful swelling of the elbow with restriction of movements. There were no open

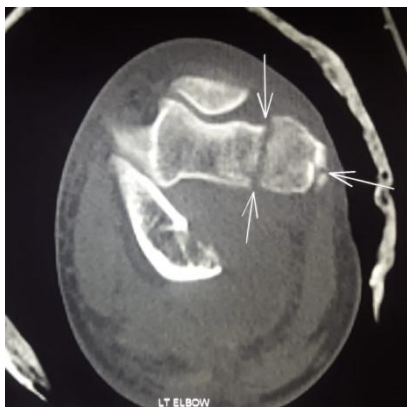
wounds and no neurovascular injury. Radiographs showed a low supracondylar fracture of the left distal humerus type C3 with an intra-articular Extension. (figure 1).



**Figure 1:** x-ray showing bicolumnar fracture of distal humerus AP and Lateral view.



**Figure 2:** CT of the left elbow showing intraarticular extension of the bicondylar fracture of distal humerus



**Figure 3**



**Figure 3 and Figure 4** CT showing Displaced comminuted fracture involving distal metaphyseal region of humerus extending to capitulum and lateral epicondylus. Large joint effusion noted extensive soft tissue noted.

## 2. Outcome and Follow-Up

The long-arm cast was applied for a period of 8 weeks. No wound or neurovascular complications were noted. Postoperative X-rays showed a good reduction of intra-

articular fragments and both the columns of the distal humerus. The fracture healed uneventfully. The range of movement improved from 20° to 100°, 3 months after the operation, to 5°–120° .6 months after the operation with full range of flexion, extension, pronation and supination. At 48 month follow up, no deformity of the left elbow was noted. There was a slight limitation of elbow flexion with full extension, flexion, pronation and supination as compared with the contralateral side. The patient was asymptomatic and was able to resume daily activities. A radiograph showed no degenerative change in the left elbow.



**Figure 6:** Postoperative X-rays showed anatomic reduction of the articular surface with good anatomical reduction with bicolumnar fixation with intercondylar compression screw in situ.



**Figure 7:** Wound picture shows healthy sutured incision and the drain removal site.

### 3. Discussion

Supracondylar fracture is a uncommon injury in adults than childrens. Moreover, the intrarticular can be missed in the initial radiological examination .Radiograph of the elbow in traction usually reveals intra articular extension. Supracondylar fracture with intra articular extension was confirmed by intraoperative fluoroscopy. A high degree of attention is needed in order not to miss the intra-articular fracture, especially in case of a low supracondylar fracture and a history of high-energy trauma.<sup>1 6</sup> A preoperative CT and MRI can provide a better preoperative assessment and facilitate the planning of the operation. These procedures are feasible even when a long-arm cast or slab is used to immobilise the fracture.

Different treatment options have been proposed, including cast immobilisation, olecranon skeletal traction, closed reduction and pinning,<sup>1 7</sup> and open reduction and internal fixation with bi-columnar plating.<sup>1</sup> Conservative treatment is indicated in the case of undisplaced extra articular fractures. CT examination with 3d Recon is needed to confirm the integrity of the articular surface before conservative treatment is offered. The complications of supracondylar fractures of humerus are malunion, nonunion, elbow stiffness leading to functional disability.

According to AO principles of internal fixation, four hypothesis were proposed;

- Anatomical reduction
- rigid internal fixation
- least stripping of soft tissues
- early elbow mobilization

Through triceps splitting approach, elbow was visualized ,fracture reduction was done. initially fixed with 2mm k-wire, 6.5mm cancellous screw was used for fixation of trochlea. This transformed a three-piece T-condylar fracture of the

distal end of the humerus into a two-segment supracondylar fracture <sup>7</sup> and then bicolumnar plating was done to achieve a triangular configuration of fixation.<sup>10</sup> Postoperatively, the fractures were immobilised by a long-arm cast.<sup>1 6 10</sup>

Because most of the injuries were characterised by significant soft tissue injury along with the disruption of the articular surface, residual limitation of flexion and extension could be expected regardless of the mode of treatment.<sup>6 7</sup> Moreover, open reduction causes further iatrogenic injury to the surrounding soft tissues and may contribute to postoperative stiffness.<sup>7</sup> Immediate postoperative Continuous passive mobilization has been advocated to improve the range of motion.<sup>2 5</sup> The cast was kept for 6 to 8 weeks. We preferred to keep the cast on for a longer period than usual because the blood supply to the condylar fragments may have been jeopardised by the fracture and also the age factor of my patient. The soft tissue dissection during exposure, and the union may have been delayed. There was mild limitation of the elbow flexion, due to anterior bone block rather than to soft tissue contracture. Early postoperative CPM, to prevent elbow stiffness but with restriction of terminal flexion of the elbow.

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