



Outcome of surgical management of intercondylar fractures of distal humerus in adults using precontoured locking compression plate through trans-olecranon approach

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Abstract

Intercondylar fractures of distal humerus are uncommon injuries and present the most difficult challenge among fractures of lower end of humerus. Distal humerus fractures with intra-articular extension are complex injuries that require meticulous approach for fixation. The principle involves anatomical reduction and absolute fixation with perfect stabilization of extraosseous implants. The functional outcome has been greatly influenced by the early graduated rehabilitative exercise.

Aim and objectives: The Aim of the present study is to evaluate the Functional Outcome of Surgical Management of Intercondylar Fractures of distal humerus in Adults by Open Reduction and Internal Fixation using pre-contoured locking compression plates through trans-olecranon approach.

Material and methods: Prospective study includes 20 Adult patients with intercondylar fracture of distal humerus admitted to BGS GIMS hospital, bangalore between the periods September 2020 to September 2021 satisfying inclusion criteria.

Results: In this study of 20 cases, there were 10 males and 10 females with average of 50.8 years. 12 cases were due to RTA and 8 due to direct fall. There was a predominance of left side (13). Out of 20 Cases, 3 (15%) were of B1 type, 1 (5%) were of type B2, 6 (30%) were of C1, 5 (25%) of C2 and 5 (25%) were of type of C3.

Keywords: intercondylar, ORIF, pre-contoured LCP, trans-olecranon, distal humerus

Introduction

Approximately 7% of all adult fractures involve the elbow; of these, approximately one-third involve the distal humerus. Distal humerus fractures, therefore comprise approximately 2% of all fractures. Distal humerus fractures remain as one of the most challenging injuries to manage. They are commonly multi fragmented, occur in osteopenia bone and have complex anatomy with limited options for internal fixation. Treatment outcomes are often associated with elbow stiffness, weakness and pain. A painless, stable and mobile elbow joint is desired as it allows the hand to conduct the activities of daily living, most notably personal hygiene and feeding.

Therefore, starting with a highly traumatized distal humerus and finishing with a stable, mobile and pain free joint requires a systematic approach. Thought is required in determining the operative indications, managing the soft tissues, selecting a surgical approach, obtaining an anatomic articular reduction and creating a fixation construct that is rigid enough to tolerate early range of motion.

1. In the early and middle parts of twentieth century, operative treatment was combined with devascularizing exposure, inadequate fixation, and cast immobilization. The result was often elbow stiffness and delayed healing. In this context, non-operative treatments, such as the so-called bag- of -bones technique (a short duration of immobilization in either a cast or a collar and cuff followed by mobilization as tolerated) were established as treatment alternatives

2. Depending upon the frequency of communiton and displacement, open reduction and internal fixation with 1/3 tubular plate, pre-contoured LCP, reconstruction plate, Kirschner wire and double tension band wiring can be done individually or in combination.

The result of operative fixation of fractures of the distal humerus remained unpredictable until improved techniques for the fixation of small, articular fractures as developed by the Arbeitsgemeinschaft fur osteosynthesefragen/association for the study of internal fixation (AO/ASIF) and others were applied. On the basis of the results reported in the more recent series, fixation with two plates at 90 degrees angle with one another has become the standard against which all other treatments are measured. Despite the confidence in operative fixation that believes this shift in treatment preference, these remain challenging fractures to treat effectively and best managed by surgeons with interest and experience in skeletal trauma involving upper extremity. Even the most experienced surgeons, however may be intimidated with certain fracture characteristics, including poor bone quality, fractures involving the distal most aspects of the bone columns and fragmentation of articular surface in sagittal and coronal planes. Some have even suggested total elbow arthroplasty as an alternative to operative fixation. Although it is wise to be prepared to perform a total elbow arthroplasty in the event that a complex fracture is not amenable to internal fixation, one must keep in mind the functional limitations and eventual failure associated with total elbow arthroplasty. A surgeon

treating a healthy active patient with a fracture of distal humerus should make every attempt to reconstruct and preserve the distal humerus

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Table 1: Outcome in relation to Type of fracture

| Results | TOF | | | | | Total |
|-----------|---------|----------|---------|---------|---------|----------|
| | B1 | B2 | C1 | C2 | C3 | |
| | no.(%) | no.(%) | no.(%) | no.(%) | no.(%) | |
| EXCELLENT | 2(66.7) | 1(100.0) | 5(83.3) | 3(60.0) | 1(20.0) | 12(60.0) |
| GOOD | 1(33.3) | - | - | 1(20.0) | 2(40.0) | 4(20.0) |
| FAIR | - | - | - | 1(20.0) | 2(40.0) | 3(15.0) |
| POOR | - | - | 1(16.7) | - | - | 1(5.0) |
| Total | 3(100) | 1(100) | 6(100) | 5(100) | 5(100) | 20(100) |



Fig 1: Pre operative X ray



Fig 2: Immediate post operative X ray



Fig 3: Check X ray after 1 month



Fig 4: Check X ray after 4 months



Fig 5: Check X ray after 14 months



Fig 6: Range of movements at 4 months

Conclusion

The present study was conducted to assess the functional outcome of surgical management of twenty cases of intercondylar fracture of distal humerus. We conclude the following from our study –

1. Inter condylar fractures of the distal humerus are commoner in fourth and fifth decade of life with equal incidence of fracture in male and female.
2. The common mode of injury was Road Traffic Accidents followed by a direct fall on elbow and also left side more involved than right side.
3. Inter condylar fractures demands careful evaluation, classification of fracture type and preoperative planning.
4. Trans-olecranon approach provides best visualisation of articular surface.
5. Open reduction internal fixation should be done as early as possible. Delay in open reduction internal fixation with extensive soft tissue dissection leads to increased chances of elbow stiffness due to periarticular fibrosis.
6. Operative treatment with rigid anatomical internal fixation should be the line of treatment for all grades of AO-ASIF type fractures, more so in young adults as it gives best chance to achieve good elbow function.
7. During open reduction internal fixation, anatomic nature of articular surface should be given prime importance.
8. Anatomically pre-shaped distal humerus locking plate system is useful in providing stable fixation for complex distal articular fracture & facilitating early postoperative rehabilitation
9. Vigorous, active physiotherapy is a must for good results.

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