



# International Journal of Orthopaedics Sciences

ISSN: 2395-1958  
IJOS 2017; 3(1): 506-508  
© 2017 IJOS  
www.orthopaper.com  
Received: 13-11-2016  
Accepted: 14-12-2016

**Dr. Rakesh Tirkey**  
Assistant professor  
Department of Orthopaedics  
NSCB medical college Jabalpur  
(MP), India

**Dr. Jitendra Jamdar**  
Director and chief orthopaedics  
consultant, Jamdar hospital  
Golbazar Jabalpur (MP), India

**Dr. Rajiv Savant**  
Senior Orthopaedics consultant  
Jamdar hospital Golbazar (MP),  
India

## Prospective study of distal humerus fracture fixation with an extensor mechanism on approach

**Dr. Rakesh Tirkey, Dr. Jitendra Jamdar and Dr. Rajiv Savant**

DOI: <http://dx.doi.org/10.22271/ortho.2017.v3.i1h.73>

### Abstract

**Background:** We study result of 96 cases of distal humerus osteosynthesis which is done with extensor mechanism intact. Traditionally these fractures have been managed operatively with various extensor mechanism disrupting approaches.

**Material and methods:** Ninety six patients with distal humerus fracture were treated with open reduction and internal fixation with minimal soft tissue and extensor mechanism disruption. This study was conducted in Jamdar hospital at Jabalpur between 1<sup>st</sup> Jan 2015 to Sep 2016. The technique used here is visualizing distal humerus through lateral and medial window that avoids disruption of the triceps muscle insertion on olecranon.

**Results:** All patients are followed for 6 months. In our series all fracture shows union at 6 weeks and all fractures unite in 8 weeks. Range of motion (median) is 126°. Range (60-140°).

**Conclusion:** Better clinical and functional outcome can be achieved with this technique. Early range of motion and subsequently strengthening exercises can be initiated.

**Keywords:** Elbow fractures, distal humerus plating, approach for distal humerus

### Introduction

Traditionally distal humerus fractures are managed operatively with various extensor mechanism disrupting approaches [2-8]. Which are often associated with delayed union or non-union of the olecranon, triceps muscle weakness, and osteotomy related prominent implants [9-11]. The excellent technique described by schild-hauer *et al.* in 2003 [7] and used by JM Erpelding and associates in 2012 [1] is used here. With this technique as extensor mechanism we keep intact, early range of motion exercise can be initiated early. The technique describe here is visualizing distal humerus through lateral and medial window that avoids disruption of the triceps muscle insertion on olecranon [1, 6].

Indications [1].

- Extraarticular and intraarticular distal humerus fractures
- A-O type c<sub>1</sub> and c<sub>2</sub> intra-articular distal humerus fractures.
- Select type c<sub>3</sub> intra-articular distal humerus fractures.

Contraindications [1].

- Elbow osteoarthritis with severe comminution of the articular surface
- Severly communitied type- C<sub>3</sub> intra-articular distal humerus fractures.
- Coronal shear fracture patterns.

We operated 96 cases of distal humerus fracture with this approach at Jamdar hospital Jabalpur between 1<sup>st</sup> Jan 2015 to Sep 2016. Follow up was done for 6 months. Severly communitied fractures and compound fracture were not included in the studies. We recommend this approach to start with simple fracture and move to complex fracture pattern [1]. The advantage with this approach is that it can easily converted to an olecranon osteotomy if reduction is difficult. However in our studies there was no requirement to extend the approach.

**Correspondence**  
**Dr. Rakesh Tirkey**  
Assistant professor  
Department of Orthopaedics  
NSCB medical college Jabalpur  
(MP), India

All patients were positioned on lateral position. After proper cleaning painting and draping; Standard midline incision is used on posterior third of arm and extended over the olecranon to proximal forearm. We started with medial side of olecranon process incise the fascia flush with bone and extend proximally towards medial epicondyle, Fibers of the triceps are blunt dissected using fingers, More proximally deep fascia is incised. In our study there was no need to expose ulnar nerve. Similarly lateral gutter is formed. Perform medial and lateral arthrotomies posterior to the collateral ligament complexes and excise the intraarticular fat pad and posterior aspect of the capsule. Free the triceps muscle from the posterior aspect of humerus in an extraperiosteal fashion and connect medial and lateral windows with blunt dissection. In some cases release of the posterior band of ulnar collateral ligament medially to allow better trochlea visualization. Reduction is done with direct and fluoroscopic visualisation. To visualise intra-articular element towel clips, tinaculum or rubber drain is used to pull olecranon distally, this also facilitate reduction through ligamentotaxis. K wires are used in anteroposterior direction to reduce fracture fragments as joystick. Reduction is held with temporary k wires in transverse direction. First intraarticular fragment is reduced and fixed with 4 mm cancellous screw from medial to lateral side (from trochlea towards capitulum). After trochlea and capitulum is reduced, medial and lateral pillar is reconstructed and definitive fixation is done with plate and screws. The pillar with less comminution is reduced first. Wound is lavaged thoroughly after fixation. Triceps fascia is repaired laterally with absorbable sutures. 10 no romovac suction is used in every case. Medial side is leaved as such, ulnar nerve is allowed to find its place. After dressing above elbow slab is applied in 90° flexion. Post operative dressing is done on 2<sup>nd</sup> day with suction drain removal, elbow mobilisation is done, and slab is reapplied. Second dressing is done on 7<sup>th</sup> post-operative day with elbow mobilisation, slab is reapplied. On 15<sup>th</sup> post-operative day mobilisation of elbow is done along with stitch removal. Pop slab is also discontinued on this day. Physiotherapy care is started daily from 15<sup>th</sup> day, cuff and collar sling is also continued for further 15 days.

**Result**

In our series of 96 patients, X rays were done at immediately post-operative and at 4, 6, 8 and 12 weeks interval. Radiological healing is there at 6 weeks and all cases shows union at 8 weeks. At 6 weeks median ROM is 126°(range from 60-140°).

In similar study of thirty seven patients, all fractures healed with median motor arc of 126° (range from 60-140°) [1].

**Case 1**



Pre-operative x -rays



Post-operative x-rays



Elbow extension at 15<sup>th</sup> post op day



Elbow flexion at 15<sup>th</sup> post op day

**Case 2**



Preoperative x-rays



Postoperative x-rays



Elbow flexion on 15<sup>th</sup> post op day



Elbow extension on 15<sup>th</sup> post op day

## Discussion

The fractures of distal 3<sup>rd</sup> of humerus is treated with various approaches which disrupt extensor mechanism at elbow<sup>2-8</sup>, and often associated with delayed union or nonunion of the olecranon, triceps muscle weakness, and osteotomy related prominent implants<sup>[9-11]</sup>. The excellent technique described by schild-hauer *et al.* in 2003<sup>[7]</sup> and used by JM Erpelding and associates in 2012<sup>[1]</sup> is used here. With this technique as extensor mechanism we keep intact, early range of motion exercise can be initiated early.

Proper selection of patient is necessary when using this approach. In complex type-C3 fracture careful review of imaging study is important, 3D CT scan can be obtained before surgery. In our series exploration of ulnar nerve is not done in all cases. But it can be done in all cases to protect nerve and to prevent Ulnar neuropathy. Coronal shear fracture pattern including trochlea and capitellum are very challenging and can't be dealt with this approach. An advantage with this approach is that it can be easily converted to Olecranon osteotomy when required<sup>[1]</sup>.

## References

1. Expalping JM, Malinder A, High R, Mormino MA, Fehring EV. J Bone Joint Surg Am. 2012; 21:94(6):548-53.
2. Anglen J. Distal humerus fractures. J Am Acad Orthop Surg. 2005; 13(5):291-7.
3. Bryan RS, Morrey BF. Extensive posterior exposure of the elbow. A triceps sparing approach. Clin Orthop Relat Res. 1982; 166:188-92.
4. Canale ST, Beaty JH. editors. Campbell's Operative Orthopaedics. 11<sup>th</sup> ed. Philadelphia: Mosby, 2008.
5. Cassebaum WH. Operative treatment of T and Y fractures of the lower end of the humerus. Am J Surg. 1952; 83(3):265-270.
6. Muhldorfer-Fodor M, Bekler H, Wolfe VM, Mckean J, Rosenwaser MP. Paratricipital-triceps splitting two windows approach for distal humerus fractures. Tech Hand Up Extrems Surg. 2011; 15(3):156-61.
7. Schidhauer TA, Nork SE, Mills WJ, Henley MB. Extensor mechanism sparing paratricipital posterio approach to the distal humerus. J Orthop Trauma. 2003; 17(5):374-8.
8. Zlotoblow DA, Catalano LW 3<sup>rd</sup>, Barron OA, Glickel SZ. Surgical exposure of the humerus. J Am Acad Orthop Surg. 2006; 14(13):754-65.
9. Coles CP, Barei DP, Nork SE, Taitsman LA, Hanel DP, Bradford Henley M. The olecranon osteotomy: a six year experience in the treatment intra articular fractures of the distal humerus. J Orthop Trauma. 2006; 20(3):164-71.
10. Mc Kee MD, Wilson TL, Winston L, Schemitsh EH, Richards RR. Functional outcome following surgical outcome of the distal humerus fracture through a posterior approach. J. Bone Joint Surg Am. 2000; 82-A(12):1701-7.
11. Ring D, Gulotta L, Chin K, Jupiter JB. Olecranon osteotomy for exposure of fracture and nonunions of distal humerus. J Orthop Trauma. 2004; 18(7):446-9.
12. Sanchez-sotelo J, Torchia ME, O'Driscoll SW. Complex distalss humerus fractures: internal fixation with a principle-based parallel plate technique. J Bone Joint Surg Am. 2007; 89(5):961-9.