

Original Article
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OSTEOSYNTHESIS OF DISTAL HUMERUS FRACTURE IN ADULTS USING TRICEPS REFLECTING APPROACH

Dayanand M¹, Lokesh Holagundi²,
Deepak S³

¹ - Assistant Professor, Department of Orthopaedics,
Bangalore Medical College and Research Institute,
Bangalore, Karnataka

² - Senior Resident, Department of Orthopaedics,
Bangalore Medical College and Research Institute,
Bangalore, Karnataka

³ - Professor, Department of Orthopaedics, Bangalore
Medical College and Research Institute, Bangalore,
Karnataka

Corresponding Author:

Dr Lokesh Holagundi
Senior Resident,
Department of Orthopaedics,
Bangalore Medical College and Research Institute,
Bangalore, Karnataka
Mobile:7760628844
Email: loksdoc@gmail.com

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Abstract:

Introduction: Intraarticular fractures of the distal humerus comprise 1% of all fractures in adults and involve both the medial and lateral columns. The distribution of distal humerus fractures follows a bimodal age distribution. Recent studies have emphasised the importance of surgical approach, anatomical reconstruction, rigid fixation and early rehabilitation. Numerous operative approaches for the management of distal humeral fractures have been described. Described approaches include the paratricipital (Alonso-Llames), triceps-reflecting (Bryan-Morrey), triceps-reflecting anconeus pedicle (TRAP), triceps-splitting, and olecranon osteotomy techniques. All described approaches have its own merits and demerits. With this we are assessing outcome of these distal humerus fracture fixation with triceps reflecting approach.

Materials: 25 patients with distal humerus fracture who came to our hospital Bangalore Medical College and Research Institute were treated with posterior triceps reflecting approach. Fracture was fixed using orthogonal or parallel plating techniques with metaphyseal LCP/Reconstruction plates. Physiotherapy started from 3rd day postop with passive ROM exercises. Patient was followed at 1mth, 2mth, 3mth, 6mth, 1 year and 2 year. Clinical outcome was assessed using the DASH SCORE, radiological union and complications were noted.

Results: Post operative functional assessment done after 6 month of surgery. Functional assessment with respect to range of movement, fracture union done. The mean DASH score was 14 points (range, 0 to 100 points). The mean arc of flexion was 115° (range, 85 to 122). Mean pronation was 76° (range, 60-85) and supination was 74° (range, 60-80). The mean loss

of range of motion, as compared with that of the contralateral elbow was 8 degrees. 2 patients had extensor lag of 5 degrees.

Discussion: The principles of surgical management of intra-articular fractures of the distal humerus are anatomical restoration of the articular surface and stable fixation of the fracture fragments to allow for early motion. Careful preoperative planning, surgical expertise, and aggressive postoperative rehabilitation are essential for optimizing outcome. Orthogonal plating may be preferred in cases of an anterior shear fracture where the fixation from posterior to anterior will provide additional stability to the intra-articular fractures. Parallel plating may be the preferred technique utilized for very distal fracture

Conclusion: We conclude that internal fixation of intraarticular fractures of the distal humerus is an effective procedure with an excellent or good functional outcome in most patient age groups. Patients have a high level of satisfaction and the majority returns to their previous level of activity

Key-words: Distal humerus, intrarticular fracture, posterior approach, triceps reflecting approach.

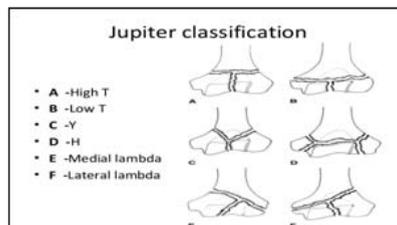
Introduction :

Intraarticular fractures of the distal humerus comprise 1% of all fractures in adults and involve both the medial and lateral columns. The distribution of distal humerus fractures follows a bimodal age distribution. High-energy injuries tend to occur among younger patients, while low-energy injuries are more common in older patients. Recent studies have emphasized the importance of surgical approach, anatomical reconstruction, rigid fixation and early rehabilitation. Numerous operative approaches for the management of distal humeral fractures have been described. All these employ a posterior skin incision with various strategies of working through or around the triceps muscle. Described approaches include the paratricipital (Alonso-Llames), triceps - reflecting (Bryan-Morrey), triceps-reflecting anconeus pedicle (TRAP), triceps-splitting, and olecranon osteotomy¹⁻³ techniques. There is controversy regarding the optimal approach for the fixation of distal humeral fractures with limitation in exposure in paratricipital and triceps splitting approach especially in intraarticular fracture. Popular Olecranon osteotomy method has its own merits and demerits.¹⁻³ Triceps reflecting and olecranon osteotomy approach provide adequate exposure in intraarticular fracture⁴. This approach is also popularly used for arthroplasty of elbow.⁵⁻⁷ Since both the exposure has their own advantages and disadvantages, we did study on posterior triceps reflecting approach its merits, demerits with our study.

Materials and methods

Prospective study was done in 25 patients who came to our institute during the period of July 2014 to

December 2015. All the patients initially assessed with respect to all system then temporary immobilization done with above elbow slab. Patient fracture distal humerus classified. The classification system proposed by Jupiter and Mehne which describes distal humeral fracture patterns into six categories: High or Low "T," "Y," "H," and Medial or Lateral Lambda fractures was used in this study.



All patients were undergone pre operative work up. Preoperative consent was taken. After anesthesia preferably under brachial plexus block, patients were positioned in lateral position pillow placed under arm, under tourniquet control incision placed over posterior midline .medial edge triceps and forearm fascia elevated as single unit off olecranon and reflected laterally, capsule incised and whole unit of capsule with triceps reflected laterally to expose the articular margin of distal humerus. Initially fracture fragments were reduced and fixed with multiple k wires then these fragments were stabilized to main fragment of fracture with orthogonal parallel locking plate and reconstruction plate.

Post operatively intravenous antibiotics give for 2days then orally continued for week. Passive range of mobilization started within 3rd day of surgery. Then active range of motion started within 2 week post operatively. Patients were followed up every month for 6 months then yearly. Clinical outcome was assessed using the DASH SCORE and Mayo

elbow score⁸⁻⁹, radiological union and complications was noted

Results:

Patients who had come to our hospital majority were male 18 (72%) and 7 were female. Majority of the fracture due to road traffic accidents 76% of which right side nearly 64%. The mean arc of flexion was 115° (range, 85 to 122). Mean pronation was 76° (range, 60-85) and supination was 74° (range, 60-80). The mean DASH score was 14 points (range 0 to 100 points). 2 patients had extensor lag of 5 degrees and 2 patients had hard ware prominence.

Discussion:

The principles of surgical management of intra-articular fractures of the distal humerus are anatomical restoration of the articular surface and stable fixation of the fracture fragments to allow for early motion. Careful preoperative planning, surgical expertise, and aggressive postoperative rehabilitation are essential for optimizing outcome. triceps reflecting approach is gaining popularity which prevents complication of osteotomy. Use of parallel plating or orthogonal plating will depend on surgeon preference and the fracture pattern present. Orthogonal plating may be preferred in cases of an anterior shear fracture where the fixation from posterior to anterior will provide additional stability to the intra-articular fractures. Parallel plating may be the preferred technique utilized for very distal fracture patterns since more stability can be obtained by providing additional screws in the distal fragment. Lucas di¹⁰ et al in his study Mean flexion on the injured side was 138° (range 120-145), mean extension was 2° (range

-5-15), mean pronation was 86° (range 70-90) and mean supination was 85° (range 65-90). The normal side revealed 139° of mean flexion (range 130-145), mean extension one degree (range-5-10), mean pronation 89° and mean supination 88° with ranges from 80-90°. In our study mean arc of flexion was 115° (range, 85 to 122). Mean pronation was 76° (range, 60-85) and supination was 74° (range, 60-80), 5 degree extensor lag in 2 cases. In his study The mean Quick DASH score was 10.3 in our study The mean DASH score was 14 points (range 0 to 100 points). In Lucas di The mean Mayo elbow score was 91 (range 75-100) in our study mean Mayo elbow score was 92.

Conclusion:

We conclude that internal fixation of intraarticular fractures of the distal humerus with posterior triceps reflecting approach is one of the excellent approach with minimal complication and effective procedure with an excellent outcome in most patient age groups. Patients have a high level of satisfaction and the majority return to their previous level of activity.



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