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Original Article

Outcome of Intracapsular Humerus Fracture Fixation Using Triceps Sparing Paratricipital Approach

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ABSTRACT:

Background: Fractures of the proximal humerus represent 4% to 5% of all fractures. Various methods of stabilization are reported in the literature.Hence; we planned the present study to assess the outcome of Intracapsular Humerus Fracture Fixation Using Triceps Sparing Paratricipital Approach. **Materials & methods:** We planned the present investigation included evaluation of outcome of Intracapsular Humerus Fracture Fixation Using Triceps Sparing Paratricipital Approach. 15 patients with Intracapsular Humerus fractures were included in the present study.. Operative procedure was performed in all the patients under the hands of skilled orthopaedic surgeons. Intraoperative assessment of fracture fixation stability and elbow range of motion (ROM) was done. Follow-up records of all the patients was maintained which included evaluation of clinical functional and radiographic assessment. Mayo Elbow Performance Index (MEPI) was used for functional assessment in the follow-up time period. Grading of the muscle strength was done as normal, good and fair. All the results were evaluated by SPSS software. **Results:** Mean flexion range of the subjects in the present study was 128.41^0. Mean extension loss was found to be 6.25^0. MEPI was found to be 91 in the present study. On follow-up normal muscle strength was found in 11 cases while good muscle strength was observed in 4 cases. **Conclusion:** Intracapsular Humerus Fracture Fixation Using Triceps Sparing Paratricipital Approach provides good results with early initiation of elbow motion

Key words: Intracapsular Humerus Fracture, Paratricipital Approach, Triceps.

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INTRODUCTION

Fractures of the proximal humerus represent 4% to 5% of all fractures. These fractures occur in a bimodal frequency with younger high-energy and older lower-energy mechanisms. Because most proximal humeral fractures are minimally displaced and stable, these fractures can be treated nonoperatively. Osteoporosis, comminution, short-segment fracture length, and displacement complicate stabilization, fracture healing, and functional results. Despite stable rates of proximal humeral fractures, increasing rates of surgical treatment have been reported. Various methods of stabilization are reported in the literature.[1- 3]

Majority of the distal humerus fractures (96%) have a complex pattern involving both the columns and the articular surface (AO type B and C injuries).High percentage of unsatisfactory functional results following conservative treatment has been reported in the literature.[4] On the other hand,open reduction and internal fixation (ORIF) of distal humeral fractures with plates and screws has been associated with complications such as implant loosening associated with secondary loss of reduction, malposition and malunion of the fragments. Comminution of the fragments, osteopenia, delicate articular anatomy of the distal humerus, deficient bone stock available in the olecranon fossa for implant placement, further complicate the situation.[5- 7]Hence; we planned the present study to assess the outcome of Intracapsular Humerus Fracture Fixation Using Triceps Sparing Paratricipital Approach.

MATERIALS & METHODS

We planned the present investigation in Department of Orthopaedics, RUHS College of Medical sciences, Jaipur,

Rajasthan, India. It included evaluation of outcome of Intracapsular Humerus Fracture Fixation Using Triceps Sparing Paratricipital Approach. Written consent was obtained from all the subjects included in the present study before the starting of the study. 15 patients with Intracapsular Humerus fractures were included in the present study. Inclusion criteria for the present study included:

- Patients with Intracapsular Humerus fractures,
- Patients scheduled to undergo treatmentfor the same by paratricipital approach,
- Patients with negative history of any type of bone disorder
- Patients with negative history of intake of drugs with known action on the bone metabolism

A written and informed consent was obtained from all the patients who were included in the study. Operative procedure was performed in all the patients under the hands of skilled orthopaedic surgeons. Intraoperative assessment of fracture fixation stability and elbow range of motion (ROM) was done. Follow-up records of all the patients was maintained which included evaluation of clinical functional and radiographic assessment. Mayo Elbow Performance Index (MEPI) was used for functional assessment in the follow-up time period. Grading of the muscle strength was done as normal, good and fair, based on the criteria previously described in the literature.[7, 8] All the results were evaluated by SPSS software. Chi- square test was used for assessment of level of significance.

RESULTS

A total of 15 patients were included in the present study, among which 8 were males while the remaining 7 were females. Most common mode of injury of the subjects of the present study was road traffic accident which accounted for 7 cases, followed by fall from height and ground level fall. Mean age of the subjects of the present study was 45.2 years. Mean time interval from the time of injury to the time of surgery was 6.4 days.Mean flexion range of the subjects in the present study was 128.41^0. Mean extension loss was found to be 6.25^0. MEPI was found to be 91 in the present study. On follow-up normal muscle strength was found in 11 cases while good muscle strength was observed in 4 cases.

Table 1: Descriptive values

Parameter		Value
Mean age (years)		45.2
Gender	Males	8
	Females	7
Mode of injury	Fall from height	4
	Road traffic accident	7
	Ground level fall	4
Mean time interval from time of injury to the time of surgery (days)		6.4

Graph 1: Description of mode of injury

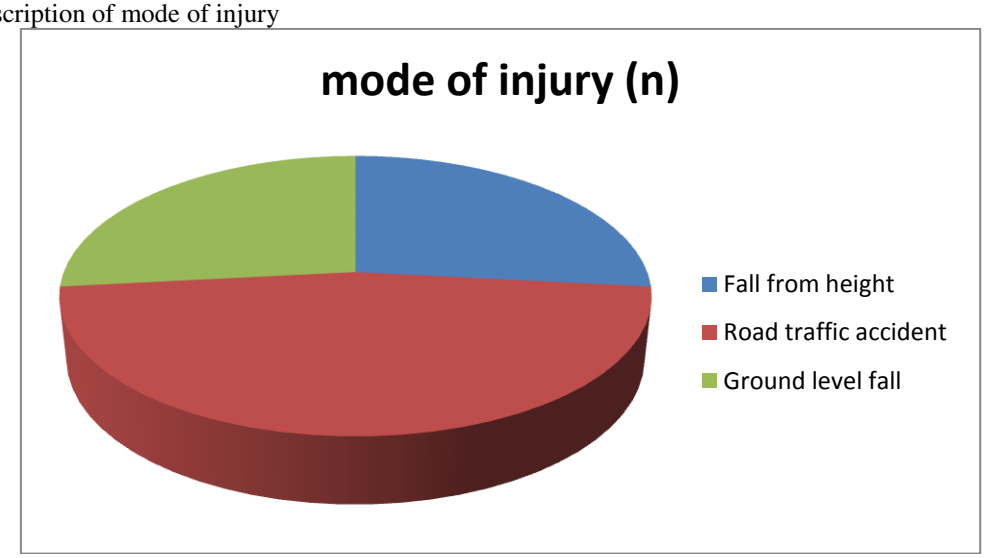

Table 2: Results of the present study

Parameter		**Value**
Mean flexion (^{0}) range		128.41
Extension loss (^{0})		6.25
MEPI		91
Muscle strength (n)	**Normal**	11
	good	4

DISCUSSION

In the present study, a total of 15 patients were included in the present study, among which 8 were males while the remaining 7 were females. Most common mode of injury of the subjects of the present study was road traffic accident which accounted for 7 cases, followed by fall from height and ground level fall. Mean age of the subjects of the present study was 45.2 years. Yadav V et al presented the functional outcome of intraarticular distal humerus fracture fixation using a triceps-sparing paratricipital approach which allows early elbow mobilization and preserving triceps strength. Twenty five patients with intraarticular distal humerus fracture were operated using triceps-sparing paratricipital approach with orthogonal plate construct. There were 16 male and 9 female patients and average age was 42.16 years (range 23-65 years). The mechanism of injury was fall from height (n = 8), road traffic accident (n = 13) and ground level fall (n = 4). Clinical, radiological, and functional assessment with Mayo Elbow Performance Index (MEPI) were obtained at follow up period. All fractures united primarily. At the mean follow up of 13.58 months (range 6-22 months), mean elbow flexion was 121.08° (range 94°–142°) and mean motion arc was 114.92°(range 65°-140°). The mean MEPI score was 94.40 points (range 70–100) with 17 excellent, five good, and three fair results. The mean flexion deformity or extension loss was 6.16° (range 5°–15°). Open reduction and internal fixation of intraarticular distal humerus fractures with triceps-sparing paratricipital approach provide adequate exposure with no adverse effect on triceps muscle strength and allows early initiation of elbow motion.[9]Chou YC et al determined if the triceps-reflecting anconeus pedicle (TRAP) approach combined with the precontoured locking plate can provide acceptable clinical outcomes in the treatment of comminuted distal humerus fracture. Clinical assessment included evaluation of range of motion and determination of the pain score, Mayo Elbow Performance Index (MEPI) score, and Disability of the Arm Shoulder and Hand (DASH) score. The fractures healed within 3 months in 25 patients (53%) and within 6 months in 23 patients (47%). The 12-month assessment revealed improved elbow movement, with the mean arc of flexion-extension of 121° (range, 100°-140°), mean arc of supination-pronation of 163° (range, 150°-180°), and mean flexion contracture of 8° (range, 0°-30°). The mean MEPI score was 81 and the mean DASH score was 11.7. By retaining the intact olecranon by the TRAP approach, orthopedic surgeon can get adequate surgical exposure for fracture fixation and can use olecranon as a three-dimensional template to restore the articular fragments.[10] Mean time interval from the time of injury to the time of surgery was 6.4 days. Mean flexion range of the subjects in the present study was 128.41^0. Mean extension loss was found to be 6.25^0. MEPI was found to be 91 in the present study. On follow-up normal muscle strength was found in 11 cases while good muscle strength was observed in 4 cases. Patel J et al evaluated the functional and radiological results, along with the complications associated, of open reduction and internal fixation using precontoured anatomical locking LCP plate system for intraarticular distal humerus fractures in adult patients. There were 25 closed fractures and 6 open grade 1 fractures. The clinical followup using Mayo elbow performance score (MEPS) and radiographic follow up with elbow anterior-posterior and lateral view X-rays were performed postoperatively.Nonunion of distal humerus fracture occurred in 2 cases. Other complications were hardware prominence in 3 cases, superficial infection in 4 cases and Ulnar nerve neuropraxia in 1 case which was recovered uneventfully. Revision surgery was not required in any complication. Open reduction and internal fixation with precontoured distal humerus anatomical locking plate system is a good method of treatment for complex Supra- intercondylar fracture of distal humerus with good functional outcome and low rates of complications.[11]

CONCLUSION

Intracapsular Humerus Fracture Fixation Using Triceps Sparing Paratricipital Approach provides good results with early initiation of elbow motion.

REFERENCES

1. Baron JA, Karagas M, Barrett J, Kniffin W, Malenka D, Mayor M, Keller RB. Basic epidemiology of fractures of the upper and lower limb among Americans over 65 years of age. Epidemiology. 1996;7:612–618.
2. Gosal G, Singh M. A study to assess outcome of osteosynthesis of AO type C fractures of distal humerus using triceps-on approach. Int J Sci Res. 2015;4:1616–9
3. Hawkins RJ, Switlyk P. Acute prosthetic replacement for severe fractures of the proximal humerus. ClinOrthopRelat Res. 1993;289:156–160.
4. Beaton DE, Katz JN, Fossel AH, Wright JG, TArasuk V, Bombardier C. Measureing the whole or the parts? Validity, reliability, and responsiveness of the disabilities of the Arm, Shoulder and Hand outcome measure in different regions of the upper extremity. J Hand Ther. 2001;14:128–146.
5. Zhang C, Zhong B, Luo CF. Comparing approaches to expose type C fractures of the distal humerus for ORIF in elderly patients: Six years clinical experience with both the triceps-sparing approach and olecranon osteotomy. Arch Orthop Trauma Surg. 2014;134:803–11.
6. Gibson JN, Handoll HH, Madhok R. Interventions for treating proximal humeral fractures in adults. Cochrane Database Syst Rev. 2002;2:CD000434.
7. Manueddu CA, Hoffmeyer P, Haluzicky M, Blanc Y, Borst F. Distal humeral fracture in adults: Functional evaluation and measurement of isometric strength. Rev Chir Orthop Reparatrice Appar Mot. 1997;83:551–60.
8. Hislop HJ, Montgomery J, editors. Elbow extension (triceps brachii). In: Daniels and Worthingham's Muscle Testing: Technique of Manual Examination. 8th ed. Philadelphia: WB, Saunders Co; 2007. p. 120.
9. Yadav V, Sharma P, Gohiya A. Functional outcome of intraarticular distal humerus fracture fixation using triceps-sparing paratricipital approach. Indian Journal of Orthopaedics. 2016;50(6):595-601.
10. Chou YC1, Hsu YH2, Yu YH3, Wu CC4. Triceps-reflecting anconeus pedicle approach with double precontoured locking plate fixation is efficient in the treatment of orthopaedic trauma association type C distal humerus fracture. Injury. 2016 Oct;47(10):2240-2246.
11. J1, Motwani G2, Shah H1, Daveshwar R1. Outcome after internal fixation of intraarticular distal humerus (AO type B & C) fractures: Preliminary results with anatomical distal humerus LCP system. Trauma. 2017 Jan-Mar;8(1):63-67.