

Fixation Evaluation of Comminuted Distal Humeral Fractures by Narrow DCP

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A total of 20 cases studied aimed to evaluate fixation of comminuted distal humeral fractures by narrow DCP. Over 52% of the subjects received injuries due to motor vehicle accident, 29% due to fall from height and 19% due to assault. Most common age group in the series was 18-40 years. Mean union time was 13.88 (\pm 3.28) weeks. Functional outcome of this treatment was analyzed by Constant and Murley Scoring (1999). Excellent functional outcome found in 35.29%, good in 52.94% and fair in 11.76% cases. Regarding the final outcome, satisfactory result was found in 82.35% cases and unsatisfactory result in 17.65%. Open reduction and internal fixation of comminuted distal humeral shaft fractures by narrow dynamic compression plate and screws in polytrauma patient and in patient who needs early mobilization is the satisfactory method of fixation.

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Introduction

Fracture of humeral shaft is relatively common in younger age group. The fracture usually results from direct violence. Observation reveals that two-thirds of humeral shaft fractures are of the distal diaphysis. Most of the humeral shaft fractures can be successfully treated conservatively. But there are some well defined indications for surgery. Operative treatment usually reserved for the treatment of nonunion,¹ for polytrauma patients,² bilateral humeral shaft fractures, floating elbow, segmental fractures, pathological fractures and distal humeral spiral or comminuted fractures.

Operative methods include open reduction and internal fixation by plate and screws, by intramedullary nail or semiflexible pins and

external fixator. Among various modalities of surgical treatment dynamic compression plate fixation remains the 'gold standard' according to Farragos et al. It permits excellent reduction and fixation and does not interfere with elbow and shoulder function.

In comminuted distal humeral fracture usually there is a third fragment situated posteromedially. Dynamic compression plate gives additional advantage of fixing the fragments putting the screw obliquely up to 45⁰ if necessary. Fracture with a third fragment require plate osteosynthesis.³ The incidence of comminuted distal humeral fracture is high and there is no records of evaluating the results of open reduction and internal fixation of such fractures by dynamic compression plate in our context.

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This study has been done to determine whether this method would improve the results of humeral shaft fractures and provide a simple, safe and reliable technique.

Methods

This was a prospective study carried out at the National Institute of Traumatology and Orthopaedic Rehabilitation (NITOR), Dkaha between July 2003 to June 2005. Study population were 20 patients with comminuted fracture of distal humerus diagnosed on clinical and radiological basis. The inclusion criteria were adult patient above 18 years, both sexes, closed comminuted distal humeral shaft fracture and fracture less than 3 weeks old. Exclusion criteria were age less than 18 years, open fracture, pathological fracture and nonunion. A total of 20 cases fulfilling above mentioned enrollment criteria were consecutively included in the study. Data were collected using a structured questionnaire which contains all the key variables of interest.

Detailed Procedure

Detailed history of the patients was taken and clinical examination performed. Radiological examination and laboratory investigations were done. Preoperative preparation regarding patient counselling, preanaesthetic checkup and collection of appropriate size narrow dynamic compression plate and screws were done. Under general anaesthesia the fracture site was opened by standard posterior Triceps splitting approach. Care was taken to save the radial nerve from injury. Reduction of the fracture fragments done and narrow DCP was placed on the posterior surface of humerus and fixation done engaging at least six cortices both above and below the fracture site. The wound was closed in usual way keeping a drain in situ and after dressings the limb was immobilized in a long arm back slab. The patients were regularly followed up at 3 weekly intervals for first 6 weeks and

there after at monthly intervals till fracture healing was achieved.

Results

The final outcome of the study was analyzed by using Constant and Morley score of functional assessment. Among 17 patients there was excellent result in 6 cases (35.29%), good in 9 (52.94%) cases and fair in 2 (11.76%) cases as showed in Table 1.

| Outcome | Frequency | Percent |
|-----------|-----------|---------|
| Excellent | 6 | 35.29 |
| Good | 9 | 52.94 |
| Fair | 2 | 11.76 |

Table I: Outcome of treatment of Humeral fractures by Narrow DCP (n=17)

Overall a satisfactory result was found in 15 (88.24%) cases and unsatisfactory in 2 (11.76%) cases as showed in Figure 1.

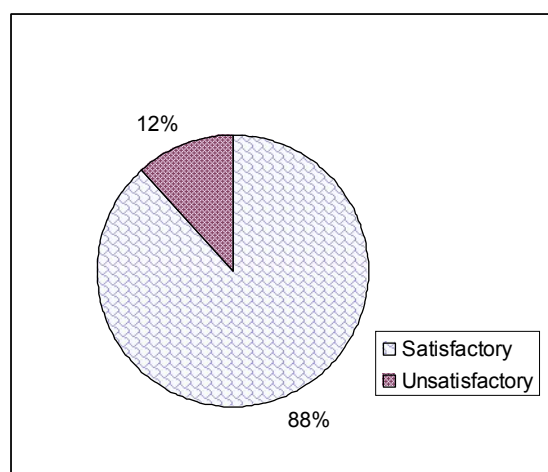


Figure 1. Overall a satisfactory result of treatment of humeral fractures by narrow DCP (n=17)

Discussion

Most humeral shaft fractures can be treated nonoperatively but open reduction may be indicated in selective cases. Fracture of the humeral shaft can be fixed internally by plate

and screws, intramedullary nails and external fixation devices amongst which plate-screw is the 'gold standard'. Union time of fracture in this series was minimum 10 weeks and maximum 22 weeks, mean 13.88 (\pm 3.26) weeks. In the study of Robison et. al mean time of union was 18 weeks (8-96 weeks).⁵ In the study of Habernek and Orthner average union time was 2 months.⁶ In our study 1 patient (5.88%) developed postoperative superficial wound infection which was controlled by regular dressing and sensitive antibiotic. Another patient developed restricted elbow movement which was treated by postoperative physiotherapy.

In this series the result was excellent in 35.29%, good in 52.94% and fair in 11.76% cases. Over all a satisfactory result was found in 88.44% cases and unsatisfactory in 11.76% cases.

Conclusion

Open reduction and internal fixation of comminuted distal humeral shaft fractures by narrow dynamic compression plate and screws in polytrauma patient and in patient who needs early mobilization is the satisfactory method of fixation.

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