International Journal Of

Recent Scientific Research

ISSN: 0976-3031

Volume: 7(1) January -2016

TREATMENT OF DISPLACED MID-THIRD CLAVICLE FRACTURES WITH PRECONTOURED LOCKING COMPRESSION PLATE-A PROSPECTIVE STUDY

Raghu Kumar J and Gutta Sri Harsha

THE OFFICIAL PUBLICATION OF
INTERNATIONAL JOURNAL OF RECENT SCIENTIFIC RESEARCH (IJRSR)
http://www.recentscientific.com/ recentscientific@gmail.com

ISSN: 0976-3031

Available Online at http://www.recentscientific.com

International Journal of Recent Scientific Research
Vol. 7, Issue, 1, pp. 8608-8610, January, 2016

International Journal of Recent Scientific Research

RESEARCH ARTICLE

TREATMENT OF DISPLACED MID-THIRD CLAVICLE FRACTURES WITH PRECONTOURED LOCKING COMPRESSION PLATE-A PROSPECTIVE STUDY

Raghu Kumar J and Gutta Sri Harsha

Department of Orthopaedics, J. J. M. Medical College, Davangere, Karnataka, India

ARTICLE INFO

Article History:

Received 16th October, 2015
Received in revised form 24th November, 2015
Accepted 23rd December, 2015
Published online 28th January, 2016

Key words:

Clavicle fracture, Precontoured Locking Compression Plate, Union, Constant Score.

ABSTRACT

Background: Clavicle fractures had been traditionally treated non operatively which resulted in high rates of non union. The present study has been undertaken to study the role of precontoured locking compression plate in the fixation of mid-third clavicle fractures. ***Methods:*** We reviewed the results of 20 cases of displaced middle third clavicle fractures (Robinson type 2B) which were treated with open reduction and internal fixation with pre-contoured locking compression plate at JJM Medical College. ***Results:*** Out of 20 patients operated with Precontoured LCP, 12 were male and 8 were female patients. None of the patients developed superficial or deep wound infection. One patient had developed stiffness of the shoulder, One patient had implant prominence, one patient had delayed union and one patient had implant failure, none of them developed non union. Constant score was excellent in 16, Good in 3 and Fair in 1 patients. ***Conclusions:*** Precontoured locking compression plate fixation has better functional outcome, results in early return to function and avoids complications of conservative methods.

INTRODUCTION

Fractures of the clavicle are common, accounting for 5 to 10% of all fractures and up to 44% of all injuries to the shoulder girdle. Mid shaft fractures account for 80% of all clavicle fractures. Approximately 2-5% of all fractures in adults and 10-15% in children involve the clavicle (Robinson CM *et al*).

These fractures have been traditionally treated with conservative methods as suggested by Neer in his earlier report of non-union of <0.1% (Neer CS) but resulting in unsatisfactory patient outcome. Although non surgical management may be optimal for many fractures, good outcomes of non surgically treated fractures are not universal (Olivier A *et al*). Plate fixation options include low contact dynamic compression plates, which are strong, but difficult to contour and cause soft tissue irritation. Reconstruction plates are easier to contour, but lack sufficient mechanical strength. Pre-contoured locking plates provide immediate rigid stabilization, pain relief, facilitates early mobilization. Anatomically pre-contoured implants have the potential advantages of not requiring further bending, having a lower profile causing fewer soft tissue problems whilst retaining the mechanical strength of the stronger plates.

The aim of this study is to analyze the functional outcome of displaced fractures of middle third of clavicle both clinically and radiologically with pre-contoured locking plate.

MATERIAL AND METHODS

20 cases of displaced middle third clavicle fractures (Robinson type 2B) were enrolled and treated with Open reduction and internal fixation with Pre-contoured locking compression plates from June 2013 to August 2015 at Bapuji and CG hospitals attached to JJM Medical College, Davangere. All patients gave informed verbal consent to be included into the study and the study was authorized by the ethical committee.

Inclusion Criteria

Age>18 years, Closed fractures, Robinson Classification 2B1 and 2B2 and no medical contraindications to anaesthesia.

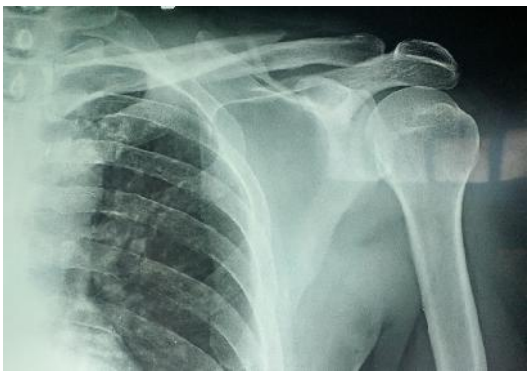
Exclusion Criteria

Age<18years, Open fractures, Pathological fractures, Undisplaced fractures, Associated head injury, Associated neurovascular injury.

Corresponding author:* **Raghu Kumar J
Department of Orthopaedics, J. J. M. Medical College, Davangere, Karnataka, India

Surgical Technique

Under general anesthesia, the patient was placed in supine position with a sponge pad placed under the affected shoulder. An incision along the superior border of clavicle was taken. The fracture site was exposed and soft tissue released carefully. After reducing the fracture, the precontoured locking compression plate was fixed over the superior surface with bicortical locking screws on either side of the fracture. Interfragmentary screw was used in oblique fractures and to fix large butterfly fragment. The wound was closed in layers and sterile dressing done and limb was supported in arm sling.



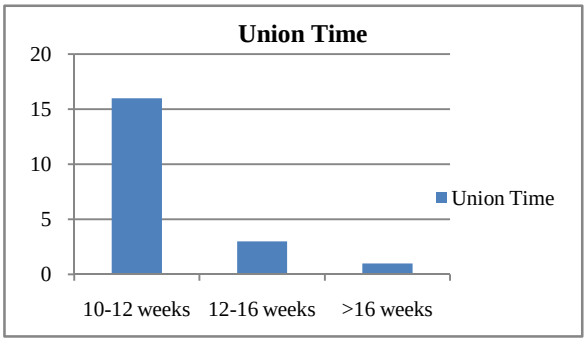
Post-Operative Protocol

Immediately after surgery, operated limb was put in arm sling. Wound was inspected at 2nd,5th and 10th days. Sutures/Staples were removed at 10th day once the wound is clean and dry. Till 3 weeks patients are advised to use sling and at 3 weeks they are advised the pendulum exercises till 6 weeks. At 6 weeks check x rays were taken and then full range of motion exercises started. Next follow-ups were done at 3months, 6 months and 1 year. Functional outcome was assessed based on Constant-Murley score.

RESULTS

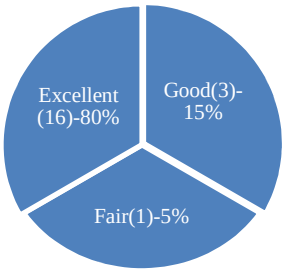
Out of 20 patients operated with Precontoured locking compression plate, 12 were male and 8 were female patients. None of the patients developed superficial or deep wound infection. One patient had developed stiffness of the shoulder which was treated with physiotherapy. An 18 year old female patient had implant prominence and the hardware had to be removed after 7 months after radiological union. One patient had delayed union. None of them developed malunion or non union. One patient had implant failure.

Type of fracture	No. Of cases
1.Robinson type 2B1	3
2.Robinson type 2B2	17



Complications	No of cases	%
1.Superficial infection	0	0
2.Hypertrophic scar	0	0
3.Plate prominence	1	5
4.Delayed union	1	5
5.Implant failure	1	5
6.Non-union	0	0

Functional outcome(Constant Score)	No of cases	%
Excellent	16	80
Good	3	15
Fair	1	5
Poor	0	0
Total	20	100



Shoulder Constant Score

DISCUSSION

As viewed in the coronal plane the clavicle is a slender bone wider medially at its sternal articulation and noticeably thinner at its lateral end. The clavicle assumes a gentle S-Shape, the medial end convex forward and the lateral end concave forward. This shape has been likened to a musical symbol clavicula and hence the name. The central transitional area represents a weak link in clavicular structure. The mid third of clavicle is therefore the commonest site of fracture.

Fall onto the affected shoulder accounts for most of the clavicular fractures with direct impact accounting for only little.

Approximately 2-5% of all fractures in adults are clavicle fractures. Neer reported a non-union rate of 0.1% for conservatively treated fractures, and non-union rate of 4.6% for fractures treated operatively. Traditionally non surgical management has been favoured as the initial management

modality because of many non union cases reported after operative management.

Recent literature is challenging the traditional belief that mid third clavicle fractures uniformly heal without functional deficit. Canadian Orthoapedic Trauma Society has conducted randomised study on 132 patients and found the DASH score significantly better at all time points for operative study group.

Micheal Zlowodski *et al* conducted a meta-analysis of 2144 fractures. In that they showed a relative risk reduction of 57% for non union using a plate compared to 86% of non union for patients treated conservatively(6).

Darren S. *et al* in a biomechanical study compared four different techniques of fixation of mid-third clavicle fractures viz.3.5mm Recon plates,3.5mm LC-DCP,3.5 mm LCP and 4.5mm Rockwood pin and found that locking plate have stiffer constructs.

Contouring of implants takes time, and experience is needed before plates can be accurately contoured to match the patient's anatomy.

Daniel Georghiu *et al* conducted a study on 29 patients with anatomically congruent LCPs and showed the plates to be effective and reliable means of fixing mid-shaft fractures due to its low profile nature. Similarly Babu. B. hundekar reviewed the results in 20 cases treated with precontoured LCPs and showed early return to function, better cosmesis and less hardware removal.

The study is limited in the fact there is no control group and therefore provides no basis for statistical analysis.

In summary open reduction and internal fixation of fracture of mid shaft clavicle gives excellent results in terms of functional outcome and low complication rates and patient satisfaction.

CONCLUSION

A pre-contoured locking compression plate proved to be a better option for mid third clavicle fractures in terms of patient compliance, hardware complication, radiological and functional outcome based on this study.

References

1. Fractures of the clavicle in the adult. Epidemiology and Classification. J Bone Joint Surg Br, 1998; 80:476-84.
2. Postacchini F, Gumina S, De Santis P, Albo F. Epidemiology of Clavicle Fractures, J Shoulder Elbow Surg.2002;11:452-6.
3. Neer CS 2nd Non Union of the Clavicle. J Am Med Assoc.1960:172:1006-11.
4. Olivier A,van der Meijden, Trevor R Gaskill, Peter J. Millet. Treatment of Clavicle fractures: Current concepts review. J Shoulder Elbow Surg 2011:1-7.
5. Canadian Orthopaedic Trauma Society. Non Operative treatment compared with plate fixation of displaced midshaft clavicular fractures, A multicenter, randomised, clinical trial, J Bone Joint Surg Am, 2007;89:1-10.
6. Michael Zlowodski, Boris A. Zelle, Peter A. Cole, Kyle Jeray, Michael D. McKee, Treatment of Acute Midshaft Clavicle Fractures: Systematic Review of 2144 Fractures, J Orthop Trauma 2005:19:504-507.
7. Darren S. Drosdowech, MD, FRCSC, Biomechanical Analysis of Fixation of Middle Third Fractures of Clavicle, *Journal of Orthopaedic Trauma* 2011.
8. Daniel Gheorghiu, Christos Sinopidis, Daniel J Brown, Treatment of Acute Clavicle fractures with an Anatomical Congruent Plate. *Journal of Surgery*, 2013.Vol.1, no.2:8-10.
9. Babu B. Hundekar, Internal Fixation of displaced middle third fractures of clavicle with precontoured locking plate, *Journal of Orthopaedics* 10(2013):79-85.

****

How to cite this article:

Raghu Kumar J and Gutta Sri Harsha.2016, Treatment of Displaced Mid-Third Clavicle Fractures With Precontoured Locking Compression Plate-A Prospective Study. *Int J Recent Sci Res.* 7(1), pp. 8608-8610.

TSSN 0976-3031