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Short term outcome of use of locking compression plates for treatment of galeazzi fracture-dislocation using anderson & sisk score

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Abstract

Objective: The study focusses on short term outcomes of locking compression plating for treatment of Galeazzi fracture- dislocation using Anderson & Sisk score.

Introduction: The Galeazzi fracture is an unstable fracture-dislocation of the forearm that includes a fracture of the shaft of the radius and a dislocation of the distal radio-ulnar joint (DRUJ). The goal of the treatment is an anatomic reduction and a rigid internal fixation of the radial fracture and also restoration of normal anatomy of the distal radio-ulnar joint.

Methodology: A cohort of 15 patients with Galeazzi fracture-dislocation treated with locking compression plates between January 2016 to January 2017 were assessed for 6 months and final result was analysed using Anderson & Sisk score.

Results: Using the Anderson & Sisk scoring system 86.66% patients (13) achieved excellent results, 6.66% patients (1) achieved satisfactory results and 6.66% patients (1) achieved unsatisfactory results.

Keywords: Galeazzi fracture-dislocation, locking compression plate, anderson & sisk score

Introduction

The Galeazzi fracture is an unstable fracture-dislocation of the forearm that includes a fracture of the shaft of the radius and a dislocation of the distal radio-ulnar joint (DRUJ). The Galeazzi fracture dislocation is an inherently unstable fracture. The Brachioradialis muscle and the extensors and abductors of the thumb tend to shorten the radius while the pronator quadratus rotates the distal fragment towards the ulna. Persistent instability of the distal radio-ulnar joint leads to an unfavourable result, with pain at the joint and restriction of fore-arm rotation. The goal of the treatment is an anatomic reduction and a rigid internal fixation of the radial fracture and also restoration of normal anatomy of the distal radio-ulnar joint. That is the reason for the high rate of unsatisfactory results of closed reduction and cast immobilization. Development of the LCP principle is based on experience gained with the PC-Fix and LISS systems. In contrast to these systems, the LCP with combination holes gives surgeons the opportunity to combine principles of internal fixation and dynamic compression, depending on the fracture site. The LCP can be used as a compression plate, a locked internal fixator, or a combination of both, depending on the patient's individual situation. This type of plate fixation relies on the threaded plate-screw interface to lock the bone fragments in position and do not require friction between the plate and bone as in conventional plating.

Methodology

This study focuses on short term outcome of use of locking compression plate as a treatment of Galeazzi fracture dislocation using Anderson & Sisk Score. The observational prospective study was conducted at tertiary care hospital between January 2016 to January 2017. 15 patients with Galeazzi fracture dislocations, treated with locking plates were enrolled in this study based on following inclusion and exclusion criteria.

Inclusion Criteria

1. Fracture shaft of radius with an associated dislocation of distal radio ulnar joint. The shaft is considered to be that part of radius between bicipital tuberosity proximally and an area 4-5 cm from the distal articulating surface of radius distally.
2. All the Galeazzi fracture dislocation above the age of 18 years were included.
3. Galeazzi fracture dislocation without neurovascular injury.
4. Compound fracture type 1(Gustillo Anderson Classification).
5. Fresh fracture.

Exclusion Criteria

1. Galeazzi fracture dislocation <18 years age
2. Fracture of distal end of radius (eg. colle's fracture)
3. Fracture of radial head and neck
4. Associated with fracture of ulna
5. Associated with posterior dislocation of elbow.
6. Old mal united fracture of radius
7. Pathological fracture
8. Compound fracture Type 2 and 3(Gustillo Anderson Classification)
9. Neurovascular injury associated with Galeazzi fracture-dislocation.
10. Old fractures.

Radiographs were taken of the full forearm including the elbow and wrist joints and the fracture was classified using the AO classification and classification given by RETTIG et. al.

Preoperative work up including blood investigations, chest radiographs, ECG and pre-anaesthetic check up was done. Preoperatively antibiotics were given as per hospital protocol. In 13 patients a 3.5mm locking compression plate was used using dorsal Thompson's approach and in 2 patients, owing to the fracture anatomy a 3.5mm locking volar plate was used using the volar Henry approach.

Postoperative care inclusive of antibiotic support and dressing was done. Regular follow up was done at 1 month, 3 months and 6 months and radiographs were taken. The functional outcome was assessed using Anderson & Sisk score.

Observation and Analysis

Among 15 patients 14 patients were males and one was female.

Among them 10 patients were in age groups of 21-40, 2 in age group of 41-60, 2 in the age group of 61-70 and 1 in the age group of 18-20.

Among the 15 patients, 13 had vehicular accidents and 2 had fall from height.

Discussion

In our study, of the 15 patients 86.66% fractures were associated with vehicular accidents and the rest 13.33% were associated with fall from height. All of them were treated using locking compression plates. average union time was between 14-16 weeks. In our study, after intraoperatively judging the integrity of distal radio-ulnar joint, only 2 patients required D.R.U.J. fixation. In our study 86.66% patients regained wrist dorsiflexion of 70-80 degrees and wrist palmar flexion of 60-70 degrees with only 1 patient having dorsiflexion and palmarflexion between 40-5- degrees. Also, 86.66% regained forearm rotation movements between 60-80

degrees with only 13.33% having the movement between 40-60 degrees. Comparing with the normal side of individual patients, on a scale of 4, 86.66 % regained grip strength of 4/4 and only 13.33% regained strength of 3 / 4. Using the Anderson & Sisk scoring system 86.66% patients (13) achieved excellent results, 6.66% patients (1) achieved satisfactory results and 6.66% patients (1) achieved unsatisfactory results.

Table 1: Ao Classification

Classification	No. of Patients	Percentage
22 A2.3 (Simple Fracture Of Radial Shaftwith Druj Dislocation)	14	93.33
22 B2.3 (Wedge Fracture Of Radial Shaftwith Druj Location)	1	6.66
Total	15	100

Table 2: Classification Based On Level of Fracture

Level of Fracture	No. of Patients	Percentage
<7.5 Cm From Midarticular Surface Of Distal Radius : Type I	2	13.33
>7.5 Cm From Midarticular Surface Of Distal Radius : Type Ii	13	86.66
Total	15	100

Table 3: D.R.U.J. Fixation

Druj Fixation	No. Of Patients	Percentage
Yes	2	13.33
No	13	86.66
Total	15	100

Table 4: Complications

Complication	No. Of Patients	Percentage
Non-Union	-	-
Infection	-	-
Neurovascular Complication	-	-
Implant Failure	-	-
Instability Of D.R.U.J.	1	6.66

Table 5: Results

Results	No. Of Patients	Percentage
Excellent	13	86.66
Satisfactory	1	6.66
Unsatisfactory	1	6.66
Failure	-	-
Total	15	100

Conclusion

The fracture incidence was common in young and middle age groups, ranging from 21-50 years (mean age being 36.8 years). There was a male preponderance, the ratio of male: female being 14:1. All the patients were operated within 7 days of injury and within 48 hrs. of admission.

None of the patients had any associated injury and were fit for surgery. 13 patients belonged to the type II fracture (Rettig et al.) i.e. fracture being >7.5 cm from the distal mid-articular surface of radius, and 2 patients belonged to type I (Rettig et al.) i.e. fracture being < 7.5 cm from the distal mid-articular surface of radius. In 13 patients a 3.5mm locking compression plate was used using dorsal Thompson's approach and in 2

patients, owing to the fracture anatomy a 3.5mm locking volar plate was used using the volar Henry approach.

A minimum of 6 cortices were fixed on either sides of fracture, with a maximum of 8, depending on the fracture anatomy and surgeon's choice. The union rate in our study was 100%. Almost all patients achieved near full range of motion at wrist and elbow joints. Surgical site infection was found in none of the patients, in our study. One patient had mild restrictions at wrist and elbow joint, falling into the category of satisfactory result, as the patient was not compliant with physiotherapy. Only one patient achieved an unsatisfactory result with significant loss of motion at elbow and wrist due to an unstable and irreducible distal radio-ulnar joint. From our study it becomes evident that Galeazzi fracture-dislocation (fracture of distal third shaft of radius with D.R.U.J disruption) presents specific problems that are not encountered with diaphyseal fractures of other long bones. In addition to restoration of length, apposition and normal axial alignment, correct rotational alignment, achievement of normal radial bow and stabilization and reduction of distal radio-ulnar joint must also be achieved to ensure near normal range of motion at wrist and elbow joints.

The 3.5mm locking compression plate has given good results over the time. It allows for early mobilisation thereby helping to avoid muscle atrophy and joint stiffness.

Against the backdrop of the preclinical and clinical data available at present, we can conclude that the LCP system is a reliable and safe tool that extends the options open for internal fixation by plating and has advantages over other systems in terms of the stability that can be achieved with it especially in osteopenic or osteoporotic bone.



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