

Original Research Paper

Various modalities of treatment in distal radius fracture

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Abstract:

Fractures of the distal end of the radius are common injuries and are the commonest bony injury around the wrist. Management of distal radius fractures has changed significantly since Colle's proclamation in 1814. Our study is intended to find out both conceptual and practical guidance for precision treatment with an expectant favorable result. This prospective and observational study was conducted on patients with distal end radius fractures treated with closed reduction and cast immobilisation with or without percutaneous pinning, external fixation and volar plating.

Methods:

60 patients of distal end radius fractures were treated with Cast immobilization, Percutaneous Pinning and plaster immobilization, External fixation and Volar locking plate fixation. AO classification was used. Functional outcomes were assessed using "Demerit point rating system" of Gartland & Werley (modified). Patients were followed for an average of 6 months.

Results:

Patients ranged from 18-60 years of age. Average age was 39.35 ± 12.15 years. Female:Male sex ratio was 1.6:1. Fall on outstretched hand was the leading causes of injury in 38(63.3%) patients and road side accidents was the second major cause in 20(33.3%) patients. Right side in 44 (73.3%) patients and dominant hand in 42 (70%) patients was most commonly involved in present study. Maximum number of patients had A2 fracture 14(23.3%). Patients were treated according to AO classification. The most common complication encountered among the patients was stiffness. Final subjective evaluation was done using Modified Gartland and Werley Scoring System¹. We observed excellent to good results in 10(83.3%) patients and fair results in 2(16.7%) patients treated with cast immobilisation group. Excellent to good results in 6(75%) patients and fair results in 2(25%) patients treated with percutaneous pinning with cast immobilisation. Excellent to good results in 13(65%) patients and fair results in 7(35%) patients treated with external Fixation. Excellent to good results observed in 18(90%) patients in and fair results in 2(10%) patients treated with volar plating.

Conclusions:

Volar locking plating is a safe and effective treatment for unstable fractures. Specially locking implants provide advantages in fractures with metaphyseal comminuted zones.

Key Words:

Distal Radius Fracture, Functional Outcome, Colle's Fracture, Volar Plating.

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Introduction

The management of distal radius fractures has changed significantly since Colle's proclamation in 1814. Distal radius fractures have an approximate incidence of 1:10,000 people and represent 16% of skeletal and 74% of forearm fractures. They are more prevalent among females. The most common trauma mechanism is falling over the outstretched hand. The desire for anatomical restoration of the distal radial joint is the rationale for operative treatment. The extent of displacement, the degree of articular disruption, the stability and the reducibility of each fracture, as well as any concurrent injury to adjacent nerves, tendons or carpal structures must be assessed carefully in the planning of logical treatment. More than 1000 peer-reviewed studies have been published on the subject, yet there is no consensus on which treatment is superior or firm guidelines for treatment decisions. Distal End Radius fracture is frequently comminuted & this is responsible for slipping of the reduction, which is a rather common late feature. It is observed, therefore, that this fracture possesses little or no stability following closed reduction & it goes on for gradual collapse.

Methods

This prospective and observational study was conducted on patients with distal end radius fractures treated with closed reduction and cast immobilisation with or without percutaneous pinning, external fixation and volar plating. Functional results was evaluated by Modified Demerit point system of Gartland and Werley¹. An informed consent was taken and inclusion & exclusion criteria was applied.

Inclusion criteria

1. Distal radius fracture.
2. Age between 18 and 60 years.
3. Up to 2 weeks of injury.
4. Closed fractures.
5. Patient's willingness

Exclusion criteria:

1. Age less than 18 years.
2. Injury more than 2 weeks.
3. Patients with grade II and grade III open fractures.
4. Pathological fractures.
5. Fractures associated with neurovascular injury.
6. Rheumatoid arthritis(patients with deformities).
7. Unresolved contractures of forearm.
8. Patients who refused to participate in study.

Results**Distribution of Cases According to Treatment Method**

TREATMENT METHOD	AO CLASSIFICATION	NUMBER OF PATIENTS	PERCENTAGE
CAST	A2	12	20
PERCUTANEOUS PINNING WITH CAST	A2	2	3.3
	B1	6	10
EXTERNAL FIXATION	A3	7	11.7
	C2	10	16.7
	C3	3	5
VOLAR PLATING	B2	4	6.6
	B3	10	16.7
	C1	6	10
TOTAL		60	100

**Discussion**

The present study was an observational and prospective study of 60 cases of either sex having distal

end radius fracture admitted in department of Orthopaedics at Govt Medical College & Rajindra Hospital, Patiala. The patients were treated with Cast Immobilisation with or without percutaneous pinning (Group I), External Fixation (Group II) and Volar Plating (Group III).

In our study, the mean age was 39.35 ± 12.15 years ranging 18-60 years. Similar results were seen by Saraogi Akash Ashok et al (2014),² Prem Kotian et al (2017),³ Dr. Rajendra Goyal et al (2018),⁴ Soumya Ghosh et al (2014).⁵ Females were predominantly affected with distal radius fracture 37 (61.7%) while 23 (38.3%) were males, female to male ratio was 1.6:1. Similar results were seen in Asif Nazir Baba et al (2017),⁶ Vargaonkar Gauresh (2014).⁷ Fall was the leading causes of injury in 38 (63.3%) patients and road side accidents was the second major cause in 20 (33.3%) patients. Similar results were seen in study conducted by Prem Kotian et al (2017),³ Asif Nazir Baba et al (2017).⁶ Right side was involved in 44 (73.3%) patients. Dominant side was involved in 42 (70%) of the patients. Similar results seen by Dr. Rajendra Goyal et al (2018).⁴ The most common complication encountered among the patients was stiffness. Stiffness was managed by physiotherapy. Final evaluation was done using Modified Gartland and Werley Scoring System. Excellent to good results in 10 (83.3%) patients and fair results in 2 (16.7%) patients group I treated with cast immobilisation. Similar results were seen in study by Saraogi Akash Ashok et al (2014),² Ranjit Kr Baruah et al (2015),⁸ Harish Kapoor et al (2000),⁹ Excellent to good results in 6 (75%) patients and fair results in 2 (25%) patients group I treated by percutaneous pinning with cast immobilisation. Similar results were seen by Saraogi Akash Ashok et al (2014),² Suman R.K. (1983)¹⁰ Excellent to good results in 13 (65%) patients and 7 (35%) patients had fair results in group II treated with external fixation. Similar outcome was seen by Saraogi Akash Ashok et al (2014),² Cooney WP et al 1979¹¹. Excellent to good results observed in 12 (90%) patients and fair results in 2 (10%) patients in group III treated with volar plating. Same observation by Mohan Ganesan et al (2018),¹² Murakami K. et al (2007)¹³ Harish Kapoor et al (2000)⁹.

Conclusions:

The treatment goal for fractures of the distal end of the radius is fully functional recovery of the wrist and prerequisites are restoration of the anatomy and early mobilization. Extra-articular fractures give better results than intra-articular fractures. Functional outcome depends upon patient's age, fracture anatomy, displacement, reducibility, stability and articular incongruity of fractures. It has also been shown that functional results are related more to the quality of anatomical reduction than to the method of immobilization. Volar locking compression plating is a safe and effective treatment for unstable fractures of the distal radius. It can also stabilize dorsally unstable distal radius fractures with least complications. Specially locking plates provide advantages in the treatment of distal radius fractures with articular involvement (B2, B3 and C1 fractures). We recommend that displaced severely comminuted intra-articular fractures (A3, C2 and C3 fractures) should be treated with an external fixation. The cast immobilization can be done in non-articular undisplaced and non-articular displaced reducible and stable (A2 fractures).

Conflict of Interest: None

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