

Original Research Article

## **A Comparative Study of Functional Outcome in Operative Treatment versus Conservative Treatment in Fractures of Distal End Radius in Adults**

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**Abstract:** Fracture distal end of radius is an injury seen with high frequency, representing approximately one sixth of all fractures seen in emergency departments. We compared operative treatment with conservative treatment of fractures of distal end radius in 25 cases each. Patients were divided into two groups, non-operative and operative. In operative group various procedures like percutaneous pinning, Dorsal Plating, Palmar Plating, External fixator application were done. In non-operative group above elbow POP cast was applied for 3 weeks and results were compared with respect to residual deformity, functional outcome and any complication. It was concluded that the non-operative method of treatment of fracture of distal end of radius is not as efficient and adequate for maintenance of reduction as compared to operative treatment. Recovery of movements is faster in the operative group than non-operative group. Hence, operative treatment is an effective and reliable method with minimal complications and better functional end results than non-operative method of treatment for fractures of distal end of radius.

**Keywords:** Fracture Radius, Percutaneous Pinning, Dorsal Plating, Palmar Plating, External Fixator, POP Cast

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### **INTRODUCTION**

Distal radius fractures [1] remain an injury that evokes considerable interest and debate. It is an injury seen with high frequency, representing approximately one sixth of all fractures seen in emergency departments. Most distal radius fractures are extra-articular and result from a fall. They typically present a bimodal distribution with two distinct groups: children and elderly. In the older population it is more common in women and is attributed to postmenopausal osteoporosis.

Although [2, 3] the frequency of presentation of this fracture is extremely high, there are little or no evidence based guidelines for its treatment [4, 5]. Of course, there can be no general treatment advice covering all fractures, since the polyfragmentary articular fracture resulting of a high-energy trauma, can by no means be compared to the extra-articular, hyperextension fracture of the aged, osteoporotic women.

Malunion of the distal radius [6] has been associated with pain, stiffness, weak grip strength and carpal instability in a significant percentage of patients.

Long term consequences [7] include degenerative arthritis in up to 50% of patients with even minimal displacement in the young adult population.

Conservative [8] medical care consists of closed reduction and immobilization which usually lasts 4-6 weeks.

In the case of many patients, especially elderly persons, who may either have other medical problems, the restriction of movements may be ignored, which can lead to enormous handicap in everyday life.

Although [9] many radial fractures can be treated with surgical methods, the emphasis is on conservative methods of treatment. For many years the problems which may arise as a result of a distal radial fracture have thus remained unchanged.

Even after anatomical re-alignment, displacement of the fracture may occur and various

complications of fracture of lower end radius like stiffness, osteodystrophy and carpal tunnel syndrome may still occur in spite of treatment.

## MATERIALS AND METHODS

In this prospective study of 50 patients, with 25 patients in each group, patients were treated with various operative methods and conservative methods and results were compared with respect to residual deformity, functional outcome and any complication.

In the operative group:-

1. Closed reduction and percutaneous pinning was done in 6 patients.
2. Open reduction and palmar plating was done in 10 patients.
3. Open reduction and dorsal plating was done in 5 patients.
4. External fixation was done in 4 patients.

In all the patients of operative group, below elbow pop cast was applied for 3 weeks. Physiotherapy was started on next day of surgery, with active movements of fingers, elbow and shoulder. Movements of wrist were started after pop cast was removed, i.e. after 3 weeks.

In the conservative group:-

1. In 14 patients with displaced fractures, closed reduction was done and above elbow pop cast was applied.
2. In 11 patients with displaced fractures, above elbow pop cast was applied without any attempted reduction.
3. In all patients of conservative group, above elbow pop cast was applied for 3 weeks.

After 3 weeks cast was removed, check x-ray was done and below elbow pop cast was applied with wrist in neutral position. On next day of cast application, active movements of fingers and shoulder were started. Active movements of elbow were started after 3 weeks. Physiotherapy of wrist started after 6 weeks. Check x-rays were done, patients examined at regular intervals and results compared with respect to residual deformity, functional outcome and any complication.

## RESULTS AND DISCUSSION

### RANGE OF MOVEMENTS

#### Pronation

Mean value of pronation in the operative group was 69.33<sup>0</sup> and in the non operative group is 65.53<sup>0</sup>.

Singh *et al.*[10] also found pronation of 73.75<sup>0</sup> in operated patients and 66.89<sup>0</sup> in non operated patients.

Wong *et al.*[11] observed pronation of 69.75<sup>0</sup> in operated patients and 66.75<sup>0</sup> in non operated patients.

Pool C[12] said that loss of pronation occur to a lesser degree because forearm falls naturally into pronation and it is for this reason that this movement is quickly regained.

#### Supination

Average value of supination in the operative group was 73.67<sup>0</sup> and in the non operative group were 67.67<sup>0</sup>.

Singh *et al.*[10] observed supination of 61.06<sup>0</sup> in operative group and 52.26<sup>0</sup> in non operative group.

Wong *et al.*[11] observed supination of 75.20<sup>0</sup> in operative group and 72.0<sup>0</sup> in non operative group.

#### Dorsiflexion

Average value of dorsiflexion in operative group was 57.67<sup>0</sup> and in non operative group were 49.67<sup>0</sup>.

Singh *et al.*[10] observed dorsiflexion of 60.90<sup>0</sup> in operative group and 51.94<sup>0</sup> in non operative group.

Wong *et al.*[11] observed dorsiflexion of 55.30<sup>0</sup> in operative group and 51.80<sup>0</sup> in non operative group.

#### Palmar flexion

Average value of palmar flexion in operative group was 55.67<sup>0</sup> and in non operative group was 48.67<sup>0</sup>.

Singh *et al.*[10] observed palmar flexion of 46.95<sup>0</sup> in operative group and 36.79<sup>0</sup> in non operative group.

Wong *et al.*[11] observed palmar flexion of 50.40<sup>0</sup> in operative group and 49.20<sup>0</sup> in non operative group.

#### Ulnar deviation

Average value of ulnar deviation in operative group was 28.0<sup>0</sup> and in non operative group were 22.33<sup>0</sup>.

Singh *et al.*[10] observed ulnar deviation of 24.35<sup>0</sup> in operative group and 20.20<sup>0</sup> in non operative group.

Wong *et al.*[11] observed ulnar deviation of 24.30<sup>0</sup> in operative group and 21.60<sup>0</sup> in non operative group.

### Radial deviation

Mean value of radial deviation in the operative group was 22.0<sup>0</sup> and in the non operative group was 19.80<sup>0</sup>.

Singh *et al.*[10] also found radial deviation of 21.14<sup>0</sup> in operated patients and 17.95<sup>0</sup> in non operated patients.

Wong *et al.*[11] observed radial deviation of 23.0<sup>0</sup> in operated patients and 20.0<sup>0</sup> in non operated patients.

From the above values it is obvious that loss of movements was significantly less in the operative group as compared to the non operative group. It was observed that the rate of recovery of movements is faster in the operative group.

### Deformity

In the present study, in the operative group 1 (4.0%) patient had prominent ulnar styloid deformity and 1 (4.0%) patient had radial deviation deformity. In the non operative group, 3 (12.0%) patients had prominent ulnar styloid deformity, 1 (4.0%) patient had radial deviation deformity and 1 (4.0%) patient had dinner fork deformity.

Deformities are found to be higher in non operated patients than operated patients in previous studies also. Tank *et al.*[13] observed prominent ulnar styloid deformity in 10% patients and radial deviation deformity in 10% patients in the operated group.

Pool C. [12], noted that almost 85% of patients had some clinical deformity and features which gave rise to most unsightly appearance (according to the patient) were prominence of ulnar styloid and radial deviation.

### COMPLICATIONS

In the present study there was no complication in the patients treated operatively while pain in distal radio ulnar joint was present in 7 (28.0%) patients treated non operatively.

Wong *et al.*[11] observed pain in distal ulnar joint in 5% patients treated non operatively and pin tract infection in 5% patients treated operatively.

Singh *et al.*[10] found that 20% patients in the non operative group had residual pain which regular medication as compared to 10% in the operative group.

The fracture of distal end of radius should not be taken lightly because the incidence of malunion is very high in this fracture. The late complications directly attributable to malunion are osteoarthritis,

tendon rupture by attrition, weak grip, restriction of movements and secondary midcarpal collapse.

Mcqueen [6] stated that malunion of colle's fracture results in weak, deformed, stiff and probably painful wrist with the likelihood of difficulty in performing normal activities of daily living.

The patients with a malunited colle's fracture are working with an anatomically abnormal wrist and it is likely that as the time passes osteoarthritic changes may set in, in these patients which may result in further deterioration of the function of the wrist. Thus it is essential to strive for an anatomically accurate result in order to ensure minimum functional deficit.

Closed reduction and pop cast immobilisation alone is inefficient and inadequate in maintenance of reduction in a colle's fracture.

### CONCLUSION

From the observations and results of this study following conclusions can be made:

- The non operative method of treatment of fracture of distal end of radius is not as efficient and adequate for maintenance of reduction as compared to operative treatment.
- Recovery of movements is faster in the operative group than non operative group.
- Operative treatment is an effective and reliable method with minimal complication and better functional end results than non operative method of treatment of fractures of distal end of radius.

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