

A Comparison of Open Reduction & Internal Fixation Versus Closed Reduction and Casting in Distal Radius Fractures

Shaik Mahamed Abid¹, K. Jagan Mohan²

¹Assistant Professor, Department of orthopaedics, Fathima Institute of Medical Sciences, Kadapa, Andhra Pradesh, India.

²Associate Professor, Department of orthopaedics, Fathima Institute of Medical Sciences, Kadapa, Andhra Pradesh, India.

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ABSTRACT

Background: Aim: To compare open reduction & internal fixation versus closed reduction and casting in distal radius fractures. **Methods:** 72 cases of distal radius fractures involving 40 males and 32 females were classified into 2 groups of 36 each. Group A were treated with open reduction & internal fixation and group B with closed reduction and casting. Disability of the Arm, Shoulder and Hand Score (DASH), Modified Mayo Wrist Score (MMWS) and complications were recorded and compared. **Results:** It was found that VAS score in group A was 2.98 and in group B was 2.72, DASH score was 22.9 in group A and 29.4 in group B and MMWS score was 67.2 in group A and 60.5 in group B. Flexion was 71.4 in group A and 4.16 in group B, extension was 72.4 in group A and 65.3 in group B, radial deviation was 10.6 in group A and 10.1 in group B and ulnar deviation was 32.7 in group A and 28.3 in group B. Most common complication in group A was loss of reduction seen in 4 and wrist pain in 3 patients and in group B was wrist pain in 5 patients. A significant difference was found ($P < 0.05$). **Conclusion:** Complication rate was high in closed reduction and casting group as compared to open reduction & internal fixation in distal radius fractures.

Keywords: Closed reduction, distal radius fractures, internal fixation, orthopaedic injuries

INTRODUCTION

Fractures of the distal radius (DRF) are the most common orthopaedic injuries. It is one out of every six fractures presented at emergency departments.^[1] Almost 2-3rd of these fractures are displaced and need to be reduced. Researches revealed that the age rate curve is bimodal, and that the highest incidences are found in children and the elderly.^[2] Increasing incidence of these injuries may be attributed to an ageing population and the growing participation in outdoor pursuits.^[3]

Choice of treatment depends on the patient's age, life style, associated medical conditions, compliance, functional demands, limb dominance, type of fracture, severity and alignment of the fracture, condition of the soft tissue, and concomitant fractures.^[4] Treatment by closed reduction and cast immobilization can be carried out on a large scale at low expense and without admission; however, this often leads to poor radiological results and re-displacement, which can be as high as 40%. A large number of these

fractures are managed non-operatively, the number of patients who undergo surgical management is considerable.^[5] Displaced fractures are treated surgically by various methods like percutaneous pin or screw fixation, open reduction, and internal fixation with plate and screw, locking plate and screw fixation, and intramedullary nailing and external fixation.^[6] The present study aimed at comparing open reduction & internal fixation versus closed reduction and casting in distal radius fractures.

MATERIALS AND METHODS

72 cases of distal radius fractures involving 40 males and 32 females were included in the study. All patients were taken into the study after obtaining their written study.

Particulars of patients were recorded in case history proforma. Fractures were classified following AO principles as extra-articular, partially articular and articular based on radiological features and articular involvement. Patients were classified into 2 groups of 36 each. Group A were treated with open reduction & internal fixation and group B with closed reduction and casting. Disability of the Arm, Shoulder and Hand Score (DASH), Modified Mayo Wrist Score (MMWS) and complications were recorded and compared. Results of present

Name & Address of Corresponding Author

Dr. K. Jagan Mohan,
Associate Professor,
Department of orthopaedics,
Fathima Institute of Medical Sciences,
Kadapa, Andhra Pradesh, India.

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study were compared using Mann Whitney U test and level of significance was below 0.05.

RESULTS

Table 1 Comparison of parameters

| Parameters | Group A | Group B | P value |
|------------|---------|---------|---------|
| VAS | 2.98 | 2.72 | 0.91 |
| DASH | 22.9 | 29.4 | 0.15 |
| MMWS | 67.2 | 60.5 | 0.21 |

VAS score in group A was 2.98 and in group B was 2.72, DASH score was 22.9 in group A and 29.4 in group B and MMWS score was 67.2 in group A and 60.5 in group B. A non-significant difference was found ($P > 0.05$) [Table 1].

Table 2: Comparison of movements

| Movements | Group A | Group B | P value |
|------------------|---------|---------|---------|
| Flexion | 71.4 | 64.16 | 0.12 |
| Extension | 72.4 | 65.3 | 0.19 |
| Radial deviation | 10.6 | 10.1 | 0.35 |
| Ulnar deviation | 32.7 | 28.3 | 0.41 |

Flexion was 71.4 in group A and 64.16 in group B, extension was 72.4 in group A and 65.3 in group B, radial deviation was 10.6 in group A and 10.1 in group B and ulnar deviation was 32.7 in group A and 28.3 in group B. A non-significant difference was found ($P > 0.05$) [Table 2, Figure 1].

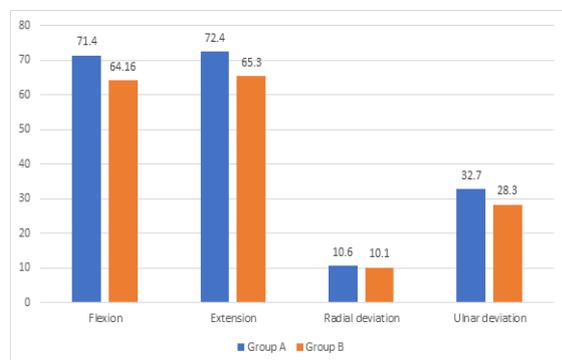


Figure 1: ?

Table 3: Complications in both groups

| Complications | Group A | Group B | P value |
|--------------------------|---------|---------|---------|
| Wrist pain | 3 | 5 | 0.05 |
| Finger edema | 2 | 3 | |
| Carpal tunnel syndrome | 1 | 1 | |
| Loss of reduction | 4 | 3 | |
| Deformity after healing | 0 | 3 | |
| Post-traumatic arthritis | 0 | 2 | |

Most common complication in group A was loss of reduction seen in 4 and wrist pain in 3 patients and in group B was wrist pain in 5 patients. A

significant difference was found ($P < 0.05$) [Table 3].

DISCUSSION

Various factors can cause secondary displacement of the fracture fragments, including shortening, angle of reduction and articular congruence.^[7] These factors determine the treatment outcomes of DRFs.^[8] In young adults, the fractures are typically the result of high-energy injuries such as motor accidents or fall from height. In contrast, most of the DRFs in the elderly occur from low-energy injuries such as fall from a standing height or on an outstretched hand.^[9] Management of DRFs is still controversial and may be influenced by the initial fracture classification.^[10] The present study aimed at comparing open reduction & internal fixation versus closed reduction and casting in distal radius fractures.

This study revealed that VAS score in group A was 2.98 and in group B was 2.72, DASH score was 22.9 in group A and 29.4 in group B and MMWS score was 67.2 in group A and 60.5 in group B. Testa et al,^[11] in their study 91 patients were divided into two groups: the ORIF group (39 patients) underwent surgery, and the conservative group (52 patients) was treated conservatively. The clinical and functional outcomes of all patients were evaluated using Short Form 36 (SF36), Modified Mayo Wrist Score (MMWS), Disability of the Arm Shoulder Hand (DASH), and Visual Analogue Scale (VAS). Results showed no significant difference between the overall SF36 score, DASH score, MMWS, and VAS results. Role limitation was significantly better in the surgical group ($p < 0.05$), and complication incidence was significantly higher ($p < 0.05$) in the conservative group.

In our study, flexion was 71.4 in group A and 64.16 in group B, extension was 72.4 in group A and 65.3 in group B, radial deviation was 10.6 in group A and 10.1 in group B and ulnar deviation was 32.7 in group A and 28.3 in group B. Priyadarshani et al,^[12] found that out of 83 patients, males were 48 and females were 35. The mean operative time was 32.4 minutes, duration of JESS application was 8.2 minutes and mean radiological union was 8.4 minutes. The mean VAS after 6 months was 9.2 and 1 year was 1.5, range of motion was 16.2 and 21.4 after 6 months and 1 year respectively, grip strength was 16.8 and 19.5 respectively, activity was 21.1 and 23.5 respectively and final score was 63.4 and 67.9 respectively.

In this study, most common complication in group A was loss of reduction seen in 4 and wrist pain in 3 patients and in group B was wrist pain in 5 patients. Singh et al,^[13] included a total of 72 patients with intra-articular distal end radius fracture which were treated with Joshi's External Stabilization System. The patients were followed

up at 2 weeks, 8 weeks, 6 months and 1 year after the surgery. The assessment of pain, range of motion, grip strength and activity were assessed at 6th month and 1 year follow up and scored according to Green and O'Brien scoring system. The good and/or excellent results were found in 77.8% of cases.

CONCLUSION

Complication rate was high in closed reduction and casting group as compared to open reduction & internal fixation in distal radius fractures.

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