

## Outcome of External Fixator in Distal Radius Fractures

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### ABSTRACT

**Aim:** To determine the success of external fixator in distal radius fractures in patients presenting in a tertiary care hospital.

**Study Design:** Descriptive case series

**Place and Duration of Study:** Department of Orthopaedic, Ghurki Trust Teaching Hospital Lahore from 7<sup>th</sup> May 2016 to 7<sup>th</sup> November 2017.

**Methodology:** One hundred and fifty diagnosed patients of distal radial fractures were included. Demographic characters like age, sex and address will be recorded. Surgery will be performed on the same day or one day later and consisted of closed reduction and fixation with a external device using two threaded rods in the second metacarpal and another two radial rods. All the rods were 3.5mm. The external fixator will be removed 6 weeks later.

**Results:** There were 114(76%) males and 36(24%) were females with mean age was 45.17±10.37 years. Overall the success rate was 72% in patients treated with external fixator.

**Conclusion:** External fixator is good for the treatment of radius fractures as it show more than good rate of success in both patients whether male or female

**Key words:** Outcome, External fixator, Distal radius fracture, Success

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### INTRODUCTION

A distal radius fracture is a common bone fracture of the radius of the forearm. Owing to its similarity to the joint of the wrist, this condition is sometimes referred to as a fracture of the wrist. Treatment is typically immobilised, although surgery is often required for complicated fractures<sup>1</sup>.

Over the years various orthopaedic treatments and methods have been devised for the treatment of distal radius fractures. The most well-known procedure, still commonly used today, is represented by an orthopaedic reduction in traction combined with flexion and ulnar deviation<sup>2</sup>.

External fixation is a surgical procedure used to repair bone fractures in which the cast does not allow the fracture to be correctly aligned. The technique may be used as such or may be correlated with an internal fixation. The theory of tensioning the capsule and ligaments by means of which the fracture is minimised is defined by the use of an external fixator in the treatment of distal radius fractures. VIDAL also introduces the concept of the ligamentary taxis<sup>3,4</sup>.

Moderately increased carpus distraction at initial fracture reduction is associated with better clinical results and does not have a detrimental impact on the subsequent range of motion of the wrist.<sup>5</sup>

External fixation tends to be the preferred form of treatment for intra-articular distal radius fractures, assuming that a successful reduction can be achieved. The procedure is also simple, the risk of infection is small and

the surrounding tissues have little damage. According to the Lindstrom Criterion Scale for Assessment of Functional Outcomes, the results were outstanding in 31%, good in 61% of patients. After 6 months, 33 patients (86%) had a VAS < 3.6.<sup>6</sup>

On the other hand, however several randomised prospective trials have shown no benefit in the use of an external fixator to immobilise reduced distal radial fractures over closed reduction and plaster immobilization in patients under 60 years of age. The external fixator group had a significant complication rate<sup>7</sup>. Like local surface pin infection 6 (10 per cent), joint incongruity 9(25%) and sepsis 9(18%). In a study performed by Westphal et al<sup>8</sup>, the subjective evaluation of ORIF was shown to be better than that of an external fixator, as treatment time was shorter and complications were rarely seen. Similarly a study conducted by Jakim et al<sup>9</sup> used the scoring system for the evaluation of clinical and radiological outcome found that excellent results (i.e., points 100 to 90) in 60% patients and good results (i.e., points 89 to 80) in 23% of the patients.

### MATERIALS AND METHODS

This descriptive case series was conducted at Department of Orthopaedic, Ghurki Trust Teaching Hospital Lahore from 7<sup>th</sup> May 2016 to 7<sup>th</sup> November 2017. A total of 150 cases of external fixation in distal radius fractures were selected. All patients of either gender, age range from 20 to 60 years and distal radial fractures with intra-articular extension (diagnosed on X-ray) were included. Patients having distal radial fractures along with other injury e.g., (abdomen injury assessed on history, or multiple fractures), not willing to participate in the study and co-existing other malignancy (like osteosarcoma assessed on history) etc were excluded. Surgery was performed on the same day or

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one day later and consisted of closed reduction and fixation with a external device using two threaded rods in the second metacarpal and another two radial rods. All the rods were 3.5mm. The external fixator was removed 6 weeks later. A regimen of intensive physiotherapy was implemented immediately after discharge. Follow up x-ray was performed at 1st week, 6 weeks, and six months postoperatively to determine the success of the procedure. The data was entered and analyzed through SPSS-22.

**RESULTS**

There were 114(76%) males and 36(24%) females with mean age 45.17±10.37 years. The overall success rate was good to excellent results in 108(72%) patients while 42(28%) patients were failed to get these results. There were 81(54%) males and 27(18%) females in whom success was noted in terms of excellent to good results. The gradual changes to success, 73(48%) initially showed excellent result, 52(37%) showed good results, 18(12%) had fair results and 7(4%) had poor results (Tables 1-3).

Table 1: Demographic information of the patients

| Variable                           | No. | %age |
|------------------------------------|-----|------|
| <b>Gender</b>                      |     |      |
| Male                               | 114 | 76.0 |
| Female                             | 36  | 24.0 |
| <b>Age (years)</b>                 |     |      |
| 20-40                              | 122 | 81.4 |
| 41-60                              | 28  | 18.6 |
| <b>Success (excellent to good)</b> |     |      |
| Yes                                | 108 | 72.0 |
| No                                 | 42  | 28.0 |

Table 2: Comparison of success (excellent to good results) according to gender

| Gender | Success (Excellent to Good results) |    | Total |
|--------|-------------------------------------|----|-------|
|        | Yes                                 | No |       |
| Male   | 81                                  | 33 | 114   |
| Female | 27                                  | 9  | 36    |

P<0.05

Table 3: Frequency of gradual success

| Variable  | No. | %    |
|-----------|-----|------|
| Excellent | 73  | 48.7 |
| Good      | 52  | 34.7 |
| Fair      | 18  | 12.0 |
| Poor      | 7   | 4.7  |

**DISCUSSION**

To prevent joint stiffness and shorten the recovery time, several external fixators that allow early exercise have been created. Slutsky<sup>10</sup> introduced what he called the first external dynamic fixator. Complex distal radius fractures of the joint pose a growing challenge for surgeons and for the design of modern surgical implants. The popularity of locked volar plating continues to rise, however, previous reports of successful outcomes focus on radiographic and surgeon-oriented success steps. Although commonly used this method has not been validated and has been harshly criticised<sup>10,11</sup>. The total number of cases in our study was more than that of any other published studies on the same topic<sup>13,14</sup>.

As the fractures are more common in men as compare to females due to difference in life styles so we

noted a difference in the incidence of patients as there were more males and less females as per in the study conducted by Chen<sup>15</sup>.

As long as success rate is concerned there was high success rate in the international studies but our study failed to achieve the same results. The success was seen in 72% of all the patients while it was 93%<sup>16</sup> and 90%<sup>17</sup>.

In the present study the success rate was low because patient’s presentation is late and people try to prefer jarah first and later visit to the hospital. Moreover care required after the procedure is also ignored as noted during follow up visits of the patients.

**CONCLUSION**

External fixator is good for the treatment of radius fractures as it show more than good rate of success in both patients whether male or female. So it can be recommended for treatment of the patients having radius fracture.

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