



Results of Low-profile Plates in the Treatment of Distal Radius Fractures: A Longitudinal Study at Our Institute

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ABSTRACT

Introduction: Distal radius fracture (DRF) is a common injury that can happen to anyone. Cast treatment, with or without closed reduction, has long been considered a viable alternative for DRF treatment.

Aim: The purpose of the study was to assess how low-profile plates treat unstable and intra-articular distal radial fracture (DRF) in terms of clinical, functional, and radiological outcomes.

Methodology: This study comprised 40 distal radius fractures treated with fragment selective fracture therapy because they were unstable and intraarticular. The Mayo wrist score was used to assess wrist function and reported postoperative problems. The researchers were looking for people over the age of 20, with closed unstable distal radius fractures, and closed intraarticular distal radius fractures. A longitudinal study. This study was conducted at Dow University & Dr Ruth K.M. Pfau Civil Hospital Karachi Pakistan from March 2020 to March 2021.

Results: The participants' ages ranged from 20 to 60, with a median age of 37 years. Fractures were most common in people between the ages of 42 and 50 years. In this study, there were n=23 (57.5%) male patients and n=17 (42.5%) female patients. The right side fracture was present in n=28 (70%) patients and in n=12 (30%) patients on the left side. The Mayo scoring system was used to analyse the results. Out of forty patients, twenty-one patients had outstanding results, ten had reasonable results, and nine had acceptable results.

Conclusion: Low-profile plates improve clinical and functional outcomes in the treatment of intra-articular DRF by providing secure fixation, allowing early joint mobilisation, and improving all above outcomes.

Key Words: Distal radius fracture, Invasive plate fixation, Palmar locking plate, Outcomes, Treatment, Surgical technique

INTRODUCTION

Distal radius fracture (DRF) is a common injury that can happen to anyone. However, there are several points of contention about the best therapeutic regimen, surgical technique, and surgical reason. There is no gold standard for treating distal radius fractures.¹ Cast treatment, with or without closed reduction, has long been considered a viable alternative for DRF treatment. However, when function

and constraints are confined, the outcomes are frequently unsatisfactory.²

DRS was reported to be the most common long bone fracture in a study of 208,094 individuals from the United States.³ DRF visits account for one-sixth of all emergency room visits.⁴ Studies reported that DRS accounts for 26% to 46% of all bone fractures observed in primary care.^{5,6} In the general population, DRFs exhibit a bimodal

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ISSN: 2231-2196 (Print)

ISSN: 0975-5241 (Online)

Received: 25.10.2021

Revised: 05.12.2021

Accepted: 14.01.2022

Published: 15.03.2022

distribution, with incidence peaks in young men and post-menopausal women.⁷

Few studies have examined the efficiency of minimally invasive plate osteosynthesis (MIPO) treatments employing these novel implants, as well as the risks associated with them. To avoid long-term morbidity impacting hand and wrist function, prompt treatment is required.⁸ Traditional treatment often causes extensive injury, leading to infection, delayed union, and non-union.⁹

However, there is still debate over the risks of existing implants and fracture patterns that are not amenable to conventional surgical procedures.¹⁰ Low-profile dorsal plates were created to solve these issues by allowing for bicolumnar fixation while reducing extensor tendon troubles.¹¹ Open reduction with internal fixation has been shown to be useful in treating displaced distal radius fractures when complete reduction by external fixation is not possible. While surgery to fix the fracture may be necessary, surgical manipulation of the surrounding soft tissue may cause further stress.¹²

The study aims to evaluate the effects of fragment-specific fracture repair in unstable and intra-articular DRF.

METHODOLOGY

This is a longitudinal study of 40 distal radius fractures that were treated with fragment selective fracture therapy because they were unstable and intraarticular. Permission was taken from the ethical review committee of the institute. Forty patients were chosen randomly. The researchers looked for those who were over the age of 20 years, had closed unstable distal radius fractures, and had closed intraarticular distal radius fractures.

Compound fractures, ancient fractures older than 14 days, infection at the fracture site, and fracture on the opposite side of the wrist, previous fractures linked to the same limb, co-morbid medical issues, and poor skin condition were all exclusion factors. All of the patients were assessed using the following criteria: fracture classification, the time between injury and surgery, and associated injuries. SPSS for Windows version 21.0 was used to conduct the statistical analysis. The data is presented as a mean, SD, or (percentage).

RESULTS

The participants' ages ranged from 20 to 60, with a median age of 37 years. Fractures were most common in people between the ages of 42 and 50 years. In this study, there were n=23 (57.5%) male patients and n=17 (42.5%) female patients. The right side fracture was present in n=28 (70%) patients and in n=12 (30%) patients on the left side. (As shown in Table 1).

To evaluate the functional result, we employ the Mayo wrist score. In our study, we found that the majority of the findings were outstanding. Out of total n=40 patients, n=24 (60%) individuals showed excellent score, n=10 (25%) individuals showed good score whereas, n=6 (8%) showed satisfactory score. (As shown in Figure 1).

On the fourth week radiograph, four patients in our study exhibited malunion. Despite the malunion, the rehabilitation procedures resulted in an excellent functional outcome for n=2 of the patients. Seven individuals in our study exhibited wrist joint stiffness as a result of poor compliance with rehabilitation exercises. (As shown in Figure 2). Minor serous discharge from the incision site was seen in four of the individuals in our study. Based on the pus culture and sensitivity report, the illness was treated with oral antibiotics for another week. The infection went away without causing any complications. This patient's union was likewise unaffected.

Table 1: Characteristics of study participants

Characteristics	No of Patients (n=40)	Percent
Age groups (years)		
20-30	12	30
30-40	17	42.5
40-50	9	22.5
50-60	2	5
Gender		
Male	23	57.5
Female	17	42.5
Fracture Site		
Right Side	28	70
Left Side	12	30

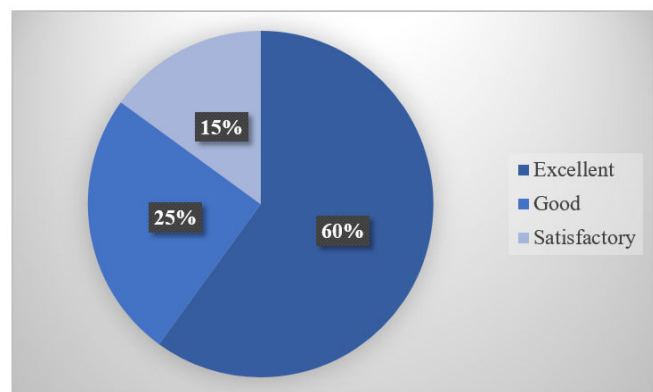


Figure 1: Distribution of Mayo Score.

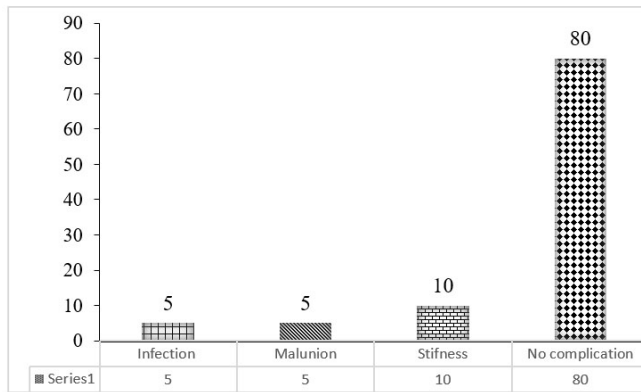


Figure 2: Distribution of Complications.

DISCUSSION

DRFs are a prevalent injury pattern that affects people of all ages in Pakistan and worldwide.¹³ Surgical treatment may be required straight away to avoid long-term incapacity, depending on the severity of the fracture.¹⁴ Findings of the current investigation are in accordance with the previous studies.¹⁵ The goal of surgery for an unstable distal radius fracture is to achieve and maintain a good reduction, whereas the goal of surgery for intra-articular fractures is to preserve articular congruity and allow for early function restoration.¹⁶ In distal radius fractures, fracture stability is necessary for a favorable outcome. In unstable fractures, loss of reduction and ultimately malunion are more frequent.¹⁷

We started with 40 patients who had a distal radius fracture and received radial plate fixation. We looked at functional outcomes in our patient group using subjective and objective evaluation methods. Due to prolonged pain, loss of motion, diminished endurance and grip strength, and midcarpal instability, malunion can have a negative impact on one's capacity to function.¹⁸

In this study, 60 %, 25 %, and 15 % achieved excellent, good, or satisfactory performance. According to recent studies, functional performance has improved significantly. The success of ORIF can be attributed to advances in implant technology and surgical procedures. Horodyski, Smith, and Wright¹⁹ reported on their techniques. A retrospective examination of 21 patients who were treated with external plating and fixation revealed the following findings. Over the course of 32 months, Benson et al. reported 85 fractures that were stabilised with specific fragment fixation, with 85 % flexion and 91 % extension, 64 excellent and 24 good results, and no clinical arthritis.²⁰ Schnall et al. found that a group of patients who experienced high-energy trauma were able to return to work in an average of 6 weeks with no loss of position or deformity, and that all fractures were healed without loss of position or deformity. The MAYO score was used to

evaluate the patient's function, which ranged from 12 percent excellent to 8 percent good.²¹

In this regard, Baig et al. (2008) examine 33 Pakistani patients. In 3 and 27.2 % of patients, infection and digital stiffness were observed respectively.²² The rate of digital stiffness in this study is higher than in the current study. To summarise, many studies' findings regarding the rate of outcome are relatively comparable, with only minor differences. The current results are also within an acceptable range and in accord with others.

Furthermore, only one patient in our trial got a minor infection, which is significantly less than the external fixator. In traditional plating techniques, nerve injury was recorded at 0- 17%. There were no neurovascular injuries in our study since the incisions were placed on safety zones that accounted for the neurovascular anatomy. Malunion was identified in one case in our investigation. However, there are several limits to our research. We just have a limited sample size, and it's from only one centre.

CONCLUSION

The DRF is a frequent fracture. As the number of road traffic accidents rises, distal radius fractures in young patients are becoming increasingly common (high velocity injury). Low-profile plates improve clinical and functional outcomes in the treatment of intra-articular DRF by providing secure fixation, allowing early joint mobilisation, and improving all above outcomes.

Funding source

None

Conflict of interest

None

Permission

Permission was taken from the ethical review committee of the institute

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