

## Analytical Study Depending on the Different Methods of Distal Radius Fractured Patients

Dr. Canaan Sattar Shuqoor Khalaf<sup>1</sup>, Dr. Ziad Tariq Ibraheem Aljameel<sup>2</sup> and Dr. Ali Adel Mohammed Alsalihi<sup>3</sup>

<sup>1</sup>M.B.Ch.B. \ C.A.B.M.S. \ (Orthopedic) Iraqi Ministry of Health, Kirkuk Health Department, Kirkuk General Hospital, Kirkuk, Iraq.

<sup>2</sup>M.B.Ch.B. \ C.A.B.M.S. \ (Orthopedic) Ministry of Health, Baghdad Medical office Al-Karkh, Al-Yarmouk Teaching Hospital, Baghdad, Iraq.

<sup>3</sup>M.B.Ch.B. \ M.Sc. \ (Orthopedic) Iraqi Ministry of Health, Kirkuk Health Department, Kirkuk General Hospital, Kirkuk, Iraq.

**Abstract:** This paper aims to Analytical the study Depending on the different methods for distal radius fractures patients and through. A cross-sectional study was conducted of a patient from different hospitals in Iraq to patients with Distal radial fracture (DRF), and the following methods were used in the treatment of percutaneous pinning (PCP) and pin-in-plaster (PP) techniques. To evaluated the function of both hands in 2 groups after reduction (m for Radial length (m), Radial Inclination, and Palmar tilt). Through the use of the techniques mentioned, a comparison was made at 50 days, 150 days, and 300 days. It was noted that the patients who were treated using the PCP technique had an improvement in my condition in addition to an improvement in my guest if it was compared with the technique in the first group pp.

**Keywords:** PP, PCP, Palmar tilt, Frykman, Radial, techniques.

### INTRODUCTION

Distal radial fracture (DRF) is a common fracture that appears to be on the rise worldwide on average; 17% of all diagnosed fractures are DRF [Court-Brown, C.M. *et al.*, 2006; Corsino, C.B. *et al.*, 2019].

DRF is constitutes 17% of the bone fractures and 66% of the forearm fractures, as most of these fractures occur in elderly patients and those aged over 50 years [Song, J. *et al.*, 2015; Ju, J.H. *et al.*, 2015].

And despite the fact that several studies showed that one week of stable DRF therapy was safe, the usual duration of infused therapy for stable DRF is four to six weeks [Chen, Y. *et al.*, 2016; Armstrong, K.A. *et al.*, 2019; Mauck, B.M. *et al.*, 2018]. In addition, recent studies have also shown that a prolonged period of immobility can lead to increased post-traumatic stress pain due to increased neglect and phobias [Houwert, R.M. *et al.*, 2016; Smeeing, D.P. *et al.*, 2017].

The purpose of this feasibility study is to determine if one week of treatment is a splint. It is possible and may lead to better functional outcomes, at least with the same patient satisfaction and complications [Beks, R.B. *et al.*, 2018].

In addition, this feasibility study will be used to determine the sample size for future randomized controlled trials [Beks, R.B. *et al.*, 2019; Ochen, Y. *et al.*, 2019].

Pin in plaster technique can be performed in different ways. With advancement of these methods, better limb function and short-time recovery can be provided for the patients [Benson, K. *et al.*, 2000; Concato, J. *et al.*, 2000].

Fracture union is not the only purpose of DRF treatment, but appropriate performance, radiographic and clinical outcomes, and also patient satisfaction are considered [Abraham, N.S. *et al.*, 2010; Anglemyer, A. *et al.*, 2014; Arditi, C. *et al.*, 2016; Frieden, T.R. *et al.*, 2017]

As for the diagnosis, it is done by traditional radiology, which assesses the degree of displacement and severing. CT scans can also be useful in assessing the number and position of the fragments [Stroup, D. *et al.*, 2000; Moher, D. *et al.*, 2009].



**Fig 1:** Treatment of Distal Radius Fractures with Percutaneous Pinning and Pin-in-plaster

### MATERIAL AND METHOD

#### Patient Sample

A cross-sectional study was conducted of a patient from different hospitals in Iraq to patients with Distal radial fracture (DRF), and the following methods were used in the treatment of percutaneous pinning (PCP) and pin-in-plaster (PP) techniques.

### Study Design

Patients were distributed as follows: 25 patients for the PCP group and 15 patients for the PP group. As for the distribution of patients by sex for the PCP group (15 male patients and ten female patients), as for the PP group, the patients were distributed according to gender (9 male patients and six female patients).

Several fixation methods have been proposed, but there is insufficient data to determine the most effective method. Therefore, a comparative study was conducted between percutaneous pinning (PCP) and pin-in-plaster (PP) techniques.

In addition, patients under the age of 20 were excluded from oblique volar fractures, open fracture, bilateral fractures.

Relying on the electronic record in the hospital, information and demographic data were collected, which included (age, body mass index, gender, and fracture mechanism).

The work in the design of the study included operating the patients in a supine position. General anesthesia was relied upon as a systematic method in anesthesia. The operation was carried out by placing a pin in the base of metacarpal bone, as for the other pin in the styloid process of the radius.

### Study Period

Cooperating with the relevant committees for the purpose of obtaining the required approvals and licenses for this study.

Demographic information and data were collected in a period of time 23-11-2019 to 5-8-2022.

### Aim of Study

This paper aims to Analytical a study Depending on the different method of distal radius fractures patients.

### Statistical Analysis

The results and demographic data of patients were analyzed using the IBM SOFT 22 spss statistical analysis program, where the analysis included finding statistical differences in addition to knowing the value of B between the two groups. CHI SQUARE was used to find out the statistical differences between the ages of the two groups. Microsoft Excel 2013 was used to draw figure results.

### Frykman Classification of Distal Radial Fractures

Relied on Frykman Classification of Distal Radial Fractures as shown in figure 2 below



**Figure 2:** Frykman Classification of Distal Radial Fractures

## RESULTS

**Table 1:** Results of patients GROUP PP according to age

Age (N=15)	F	P% of group	P% of total	Chi square
35-39	1	6.6	2.5	
40-44	2	13.3	5	
45-49	3	20	12	2.77
50-54	5	33.3	12.5	
55-60	4	26.6	10	

**Table 2:** Results of patients GROUP PCP according to age

Age (N=15)	F	P% of group	P% of total	Chi square
35-39	2	8	5	
40-44	2	8	5	
45-49	5	20	12.5	3.45
50-54	8	32	20	
55-60	8	32	20	

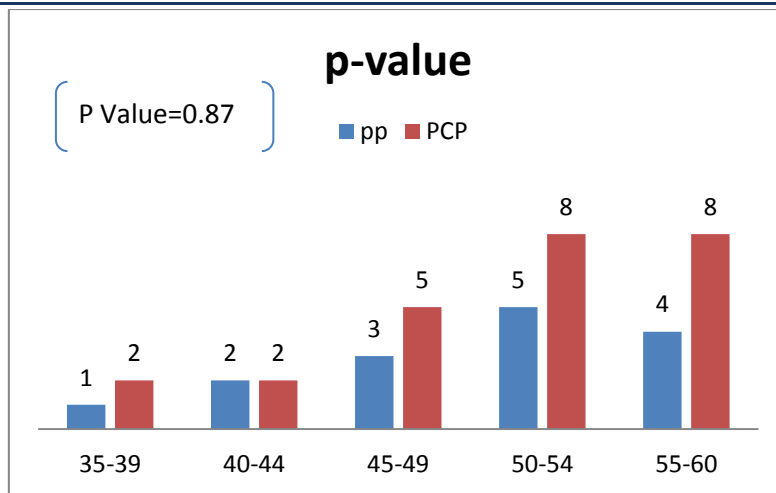


Fig 3: p-value between groups according to age

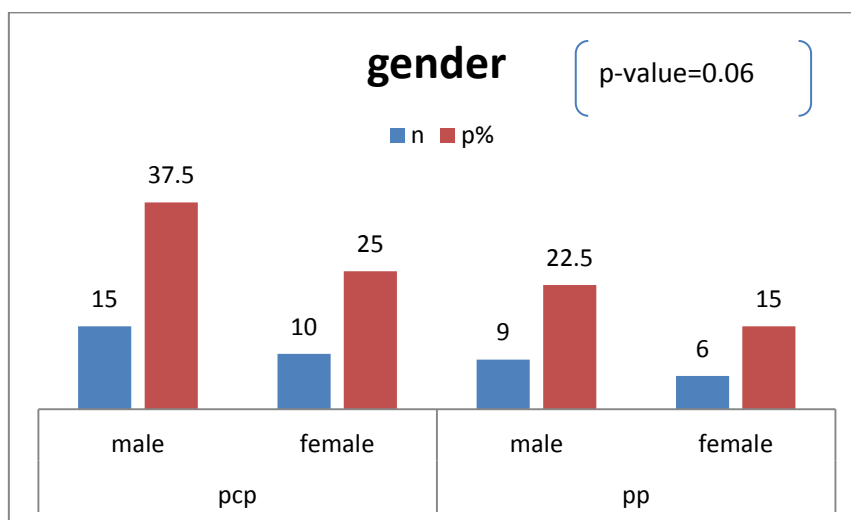


Fig 4: Distribution of patient according to sex

Table 3: Baseline demographic results of patients N=40

	PP	PCP
BMI mean ±SD	26.7±4.3	26.5±4.1
Side (Right) (N, %)	6(15)	11(27.5)
Mechanism of injury		
FALL (N, %)	5(12.5)	7(17.5)
ASSAULT (N, %)	1	2(5)
CRUSH INJURY (N, %)	3	3(7.5)
NON-ACCIDENTAL BLUNT TRAUMA (N, %)	1	2(5)
Falling from height (N, %)	5	11(27.5)

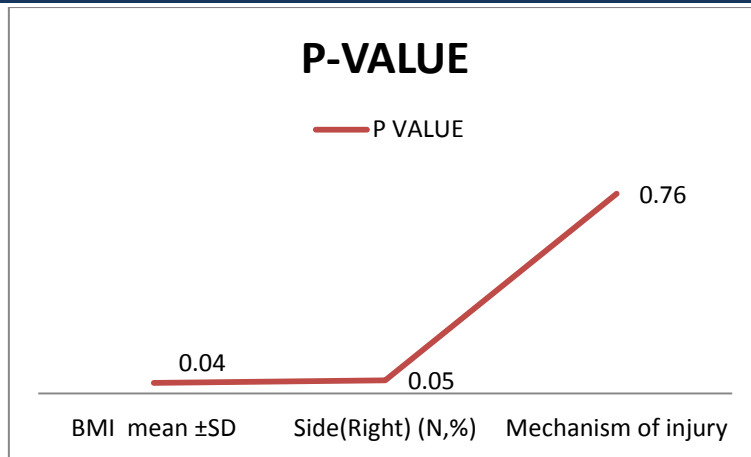


Fig 5: p-value of baseline characteristics

Table 4: Results of patients according to Frykman Classification of Distal Radial Fractures of group PP

Classification	N	P%
transverse metaphyseal fracture	6	15
type I + ulnar styloid fracture	2	5
fracture involves the radiocarpal joint	3	7.5
type III + ulnar styloid fracture	1	2.5
transverse fracture involves distal radioulnar joint	1	2.5
type V + ulnar styloid fracture	1	2.5
comminuted fracture with the involvement of both the radiocarpal	1	2.5
type VII + ulnar styloid fracture	----	--

Table 5: Results of patients according to Frykman Classification of Distal Radial Fractures of group PCP

Classification	N	P%
transverse metaphyseal fracture	5	12.5
type I + ulnar styloid fracture	4	10
fracture involves the radiocarpal joint	4	10
type III + ulnar styloid fracture	6	15
transverse fracture involves distal radioulnar joint	1	2.5
type V + ulnar styloid fracture	1	2.5
comminuted fracture with the involvement of both the radiocarpal	2	5
type VII + ulnar styloid fracture	2	5

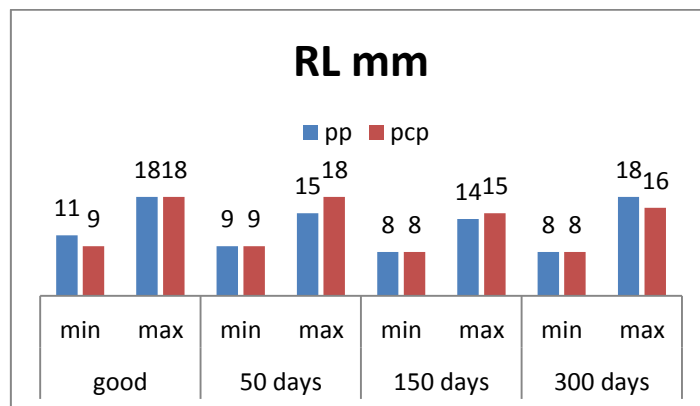
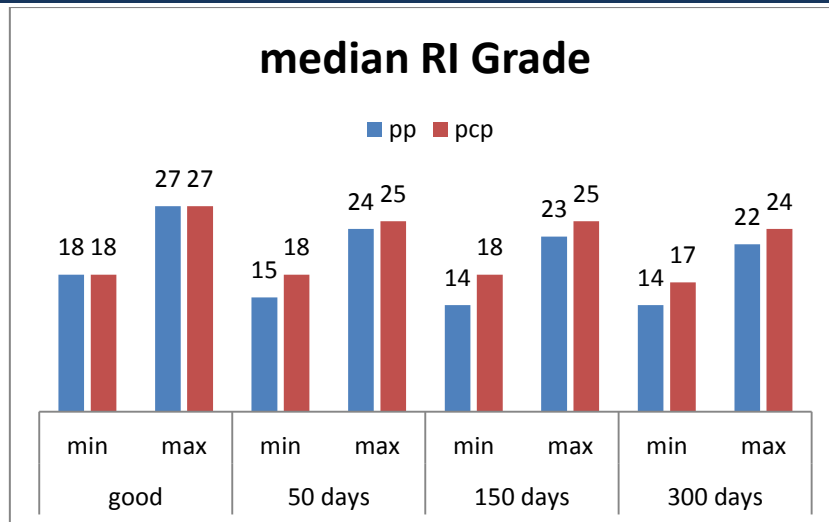


Fig 6: assessment of the function of both hands in 2 groups after reduction (Radial length(mm))



**Fig 7:** Radial Inclination (assessment of the function of both hands in 2 groups after reduction)

**Table 6:** results of patients according to Palmar tilt

		pp	PCP
good	mean	7.11	6.2
	sd	4.88	4.22
50 days	mean	-1.98	2.99
	sd	3.99	6.55
150 days	mean	-2.22	1.99
	sd	5.22	7.01
300 days	mean	-1.89	5.5
	sd	5.22	49.9

**DISCUSSION**

40 patients were collected from the hospital, and demographic data and information were analyzed based on the statistical dependence on the spss program, IBM soft 22, and Microsoft Excel 2013 and value chi-square in the pp group was 2.77, and in the second group, the PCP 3.45.

No statistical differences were found between the two groups, and the p-value was the mean age of patients between the two groups (0.87).

Patients were distributed according to gender in the PP group (9 male patients with 22.5% and six female patients with 15% distributing) and in the PCP group (15 males with 37% distributing and ten female patients with 25%) as shown in Table 2.

Assessment of the function of both hands in 2 groups after reduction (m for Radial length (m), Radial Inclination, and Palmar tilt). Through the use of the techniques mentioned, a comparison was made at 50 days, 150 days, and 300 days.

It was noted that the patients who were treated using the PCP technique had an improvement in my condition in addition to an improvement in my

guest if it was compared with the technique in the first group pp.

When analyzing the statistical differences in relation to radial length, no statistical difference was found between the two groups.

The radiological improvement contributes effectively and clearly to the treatment of distal radius fractures patients, and it is noted through the results that there are significant benefits that are reflected in patients while using percutaneous pinning technology more than pin-in-plaster. Through reviewing previous studies related to our study, we note that the results were similar to the current study.

And through the analysis of the S. Rider study in the year 2008, where the reliance in this study on pp and external fixation for 140 patients with DRF, the mean value and SD for the age of patients 50+ was 9.8, and the radial tilt inclination and palmar in group 1 were very different if compared with the second group.

**CONCLUSION**

Through the analyzes of the results that were extracted with respect to the two groups,

statistically, significant differences were found between the two groups in the functional criteria Such as supination, pronation, flexion, extension, and radial deviation, and we conclude It is the preferred method of treatment for patient's distal radius fractures percutaneous pinning (PCP) It can be considered as a convenient and preferred method for patients.

## RECOMMENDATION

It is possible to rely on outpatient clinics for the treatment of DRF, But it often requires hospitalization, including when undergoing surgery.

Distal radius fractures are often associated with injuries of the distal radial ulnar joint (DRUJ), and it is recommended that lateral x-rays of the wrist be obtained after reduction in all patients with distal radius fractures in order to prevent injuries or dislocations.

## REFERENCES

1. Court-Brown, C.M. and Caesar, B. "Epidemiology of adult fractures: a review." *Injury* 37.8 (2006): 691-697.
2. Corsino, C.B. and Sieg, R.N. "Distal radius fractures." *StatPearls [Internet]* (2019). <https://www.ncbi.nlm.nih.gov/books/NBK536916/>
3. Song, J., Yu, A.X. and Li, Z.H. "Comparison of conservative and operative treatment for distal radius fracture: a meta-analysis of randomized controlled trials." *International journal of clinical and experimental medicine* 8.10 (2015): 17023-17035.
4. Ju, J.H., Jin, G.Z., Li, G.X., Hu, H.Y. and Hou, R.X. "Comparison of treatment outcomes between nonsurgical and surgical treatment of distal radius fracture in elderly: a systematic review and meta-analysis." *Langenbeck's archives of surgery* 400.7 (2015): 767-779.
5. Chen, Y., Chen, X., Li, Z., Yan, H., Zhou, F. and Gao, W. "Safety and efficacy of operative versus nonsurgical management of distal radius fractures in elderly patients: a systematic review and meta-analysis." *The Journal of hand surgery* 41.3 (2016): 404-413.
6. Armstrong, K.A., von Schroeder, H.P., Baxter, N.N., Zhong, T., Huang, A. and McCabe, S.J. "Stable rates of operative treatment of distal radius fractures in Ontario, Canada: a population-based retrospective cohort study (2004–2013)." *Canadian Journal of Surgery* 62.6 (2019): 386-392.
7. Mauck, B.M. and Swigler, C.W. "Evidence-based review of distal radius fractures." *Orthopedic Clinics* 49.2 (2018): 211-222.
8. Houwert, R.M., Smeeing, D.P., Ali, U.A., Hietbrink, F., Kruyt, M.C. and van der Meijden, O.A. "Plate fixation or intramedullary fixation for midshaft clavicle fractures: a systematic review and meta-analysis of randomized controlled trials and observational studies." *Journal of shoulder and elbow surgery* 25.7 (2016): 1195-1203.
9. Smeeing, D.P., van der Ven, D.J., Hietbrink, F., Timmers, T.K., van Heijl, M., Kruyt, M.C., Groenwold, R.H., van der Meijden, O.A. and Houwert, R.M. "Surgical versus nonsurgical treatment for midshaft clavicle fractures in patients aged 16 years and older: a systematic review, meta-analysis, and comparison of randomized controlled trials and observational studies." *The American journal of sports medicine* 45.8 (2017): 1937-1945.
10. Beks, R.B., Ochen, Y., Frima, H., Smeeing, D.P., van der Meijden, O., Timmers, T.K., van der Velde, D., van Heijl, M., Leenen, L.P., Groenwold, R.H. and Houwert, R.M. "Operative versus nonoperative treatment of proximal humeral fractures: a systematic review, meta-analysis, and comparison of observational studies and randomized controlled trials." *Journal of shoulder and elbow surgery* 27.8 (2018): 1526-1534.
11. Beks, R.B., Peek, J., de Jong, M.B., Wessel, K.J., Öner, C.F., Hietbrink, F., Leenen, L.P., Groenwold, R.H. and Houwert, R.M. "Fixation of flail chest or multiple rib fractures: current evidence and how to proceed. A systematic review and meta-analysis." *European Journal of Trauma and Emergency Surgery* 45.4 (2019): 631-644.
12. Ochen, Y., Beks, R.B., van Heijl, M., Hietbrink, F., Leenen, L.P., van der Velde, D., Heng, M., van der Meijden, O., Groenwold, R.H. and Houwert, R.M. "Operative treatment versus nonoperative treatment of Achilles tendon ruptures: systematic review and meta-analysis." *bmj* 364 (2019): k5120.
13. Benson, K. and Hartz, A.J. "A comparison of observational studies and randomized, controlled trials." *New England Journal of Medicine* 342.25 (2000): 1878-1886.
14. Concato, J., Shah, N. and Horwitz, R.I. "Randomized, controlled trials, observational studies, and the hierarchy of research designs." *New England journal of medicine* 342.25 (2000): 1887-1892.



15. Abraham, N.S., Byrne, C.J., Young, J.M. and Solomon, M.J. "Meta-analysis of well-designed nonrandomized comparative studies of surgical procedures is as good as randomized controlled trials." *Journal of clinical epidemiology* 63.3 (2010): 238-245.
16. Anglemyer, A., Horvath, H.T. and Bero, L. "Healthcare outcomes assessed with observational study designs compared with those assessed in randomized trials." *Cochrane Database of Systematic Reviews* 4 (2014): MR000034.
17. Arditi, C., Burnand, B. and Peytremann-Bridevaux, I. "Adding non-randomised studies to a Cochrane review brings complementary information for healthcare stakeholders: an augmented systematic review and meta-analysis." *BMC health services research* 16.1 (2016):598.
18. Frieden, T.R. "Evidence for health decision making—beyond randomized, controlled trials." *New England Journal of Medicine* 377.5 (2017): 465-475.
19. Stroup, D., Berlin, J., Morton, S., Olkin, I., Williamson, G., Rennie, D., Moher, D., Becker, B., Sipe, T. and Thacker, S. "Meta-analysis of observational studies in epidemiology: a proposal for reporting to systematically review the literature (MOOSE Guidelines)." *J Am Med Assoc* 283.15 (2008): 2008-2012.
20. Moher, D., Liberati, A., Tetzlaff, J., Altman, D.G. "Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement." *J Clin Epidemiol.* 62.10 (2009) :1006-1012.

**Source of support:** Nil; **Conflict of interest:** Nil.

**Cite this article as:**

Khalaf, C.S.S., Aljameel, Z.T.I. and Alsalihi, A.A.M. "Analytical Study Depending on the Different Methods of Distal Radius Fractured Patients." *Sarcouncil Journal of Internal Medicine and Public Health* 1.2 (2022): pp 1-7.