Original Article

Journal of Orthopaedic Education
Volume 3 Number 1, January - June 2017
DOI: http://dx.doi.org/10.21088/joe.2454.7956.3117.2

Assessment of Functional Outcomes in Late Presenting Elderly Patients with Unstable Distal Radius Fractures by Cast Application: A Prospective Study

V.K. Jain*, Ambrish Verma, Gourav Sharma*****

Author Affiliation: *Associate Professor **Assistant Professor ***Senior Resident, Department of Orthopaedics and Traumatology, Pt. J.N.M. Medical College & Dr. B.R. Ambedkar Memorial Hospital, Raipur, Chhattisgarh, India.

Reprint Request: Ambrish Verma, Assistant Professor, Department of Orthopaedics and Traumatology, Pt. J.N.M. Medical College & Dr. B.R. Ambedkar Memorial Hospital, Raipur, Chhattisgarh 492001, India.
E-mail: drambrish@gmail.com

Received: 15 March, 2017, **Accepted on:** 21 March 2017

Abstract

Aim: We will evaluate the functional outcomes in elderly patients with unstable distal end radius fractures who were not willing for operative treatment and were managed conservatively with cast application. *Background:* Despite 200 year of medical literature proving the complexity and non-solved problems in treating distal radius fractures, in no other fracture, intra-articular mal-union and metaphyseal mal-alignment is so broadly accepted [1]. *Material and Methods:* 30 elderly patients with unstable distal radius fractures with mean age of 57.1 years were managed conservatively and observed for an average period of six months and functional and radiological outcomes were assessed. *Results:* Patient Related Wrist Evaluation system (PRWE) showed all groups had minimal functional disability. Radiological assessment by Sarmiento et al modification of Lidstorm's scoring showed that 33.3% patients in group 1A had poor radiographic scores, 50% patients in group 1B had good radiographic scores whereas in group 2 , 53.3% patients had fair radiographic scores. Functional results were not found to be correlated with radiological outcomes. *Conclusion:* In elderly patients, patients having low functional demands or patients presenting to us late and not willing for any surgical treatment, mal-alignment and articular incongruence can be accepted, as radiological outcomes in this study does not correlate with the functional outcomes.

Keywords: Distal Radius; Conservative; Colles; PRWE; Elderly; Low Demand.

Introduction

Fractures of the distal radius are the most common of all orthopedic injuries accounting for nearly 20% of all fractures presenting to accident and emergency department [2]. The age distribution for injuries to the distal radius is typically bimodal with peaks in the 5–14 year age group and in elderly patients older than 60. Most distal radius fractures occur in elderly females with a male–to–female ratio of 1 to 4. Considering the complexity and heterogeneity of the fracture and considering the importance of the soft tissues, it is clear there is no tailor-made answer to the question how to treat a fracture of the distal radius. The surgeon will have to read the fracture and soft tissues and will then have to make up a treatment plan. Not only anatomical and biomechanical facts should be taken into account in this plan, but also the specific demands and needs of the patient should have a place in the plan, since we are not treating X-rays, but patients.

Very good clinical outcomes have been documented in elderly patients with unstable distal radius fractures who were treated non operatively even if the fracture was allowed to heal with mal-alignment of the distal end of radius [3]. It has been demonstrated that mal-alignment does not necessarily correlate with functional outcome

following distal radial fractures in elderly patients [4].

Material and Methods

30 elderly patients with unstable distal radius fractures were enrolled in the study between August 2012 to October 2013, with mean age of 57.1 years. These patients were managed conservatively and observed for an average period of six months. Patients were grouped in 3 groups on the basis of their time of presentation to us after the injury. Both, group 1A and group 1B, had 6 patients each, group 2 had 15 patients. These patients were managed conservatively and observed for an average period of six months. Patients in group 1A presented within 0-7 days, group 1Bbetween 8-14 days and group 2 presented after 14 days of injury.

Fractures were classified unstable on the basis of Lafontaine et al criteria i.e. dorsal communition, dorsal angulation > 20 degree, radio carpal intra articular involvement, associated ulnar fractures, elderly age group. Out of these, three criteria if present, fracture is labeled as unstable.

Patients with unstable distal radius fractures were advised surgical intervention and those patients were not willing for it were given conservative treatment POP cast were applied after closed manual reduction under image intensifier.

Cast immobilization was done for 6 weeks. Immediate post reduction standard radiographs were taken for assessment of maximal correctable reduction of these unstable fractures. Patients were then followed up for assessment of any complications especially cast complications and after 6 weeks and again after check X-rays, casts were removed which was followed by forearm brace application for 2-3 weeks and supervised physiotherapy along with hot fomentation. Patients were assessed at six weeks, 3 months and at 6 months intervals by Patient Rated Wrist Evaluation (PRWE) system.

Pain Scores

Rate your pain	0 No pain	1	2	3	4	5	6	7	8	9	10 Worst ever
At rest											
When doing task requiring repetitive wrist movement?											
When lifting heavy weight?											
When it is at its worst ?											
How often do you have pain?											

Pain score = X1 +X 2 +X3 + X4 +X 5 = A/50

Function Scores

A. Specific Activities (FUNC- A)

Activities	0 No difficulty	1	2	3	4	5	6	7	8	9	10 Unable to do
Turn a door knob											
Cutting food stuff with knife											
Fasten buttons on shirt											
Using affected hand in getting up from a chair											
Carry a 10lb object in my affected hand											
Use bathroom tissue with my affected hand											

B. Usual Activities (FUNC- B)

Activities	0 No pain	1	2	3	4	5	6	7	8	9	10 Worst ever
Personal care activities											
Household work(cleaning , maintenance)											
Work (your job)											
Recreational activities											

Function Score = (Y1 + Y2 +Y 3 + Y4 + Y5 + Y6 + Y7 + Y8 + Y9 + Y10) / 2 = B/50

Total Score = A/50 + B/50 = 46/100

PRWE Score:

Descriptor	Pain	Specific Activities FUNC (A)	Usual Activities FUNC (B)	Total Score
None	0	0	0	0
Minimal	1-10	1-12	1-8	1-20
Mild	11-20	13-24	9-16	21-40
Moderate	21-30	25-36	17-24	41-60
Severe	31-40	37-48	25-32	61-80
Very Severe	41-50	49-60	33-40	81-100

Radiological Scoring, Sarmiento et al modification of Lidstorm's scoring [27]

Final Dorsal angle	Loss of radial length	Loss of radial inclination	Score for each measurement
Neutral	<3	0-4	0
1-10	3-6	5-9	1
11-14	7-11	10-14	2
>14	>11	>14	3

Outcome	Score
Excellent	0
Good	1-3
Fair	4-6
Poor	7-12

Observation and Results

Patients in all groups had minimal functional disability as per PRWE subjective evaluation system at the end of 6 months. 33.3% patients in group 1A had poor radiographic scores, 50% patients in group 1B had good radiographic scores whereas in group 2, 53.3% patients had fair radiographic scores. Patients in all groups had minimal functional disability as per PRWE scores. Mean final PRWE score in excellent radiological group of patients were slightly worse (PRWE- 16.5) as compared to patients in poor radiological group (PRWE-14.5).

Mal-union was noted in 22.2% cases. 18.5% had prominence of ulnar styloid. 59.2% patients had no treatment related complications.

Table 1: PRWE scores

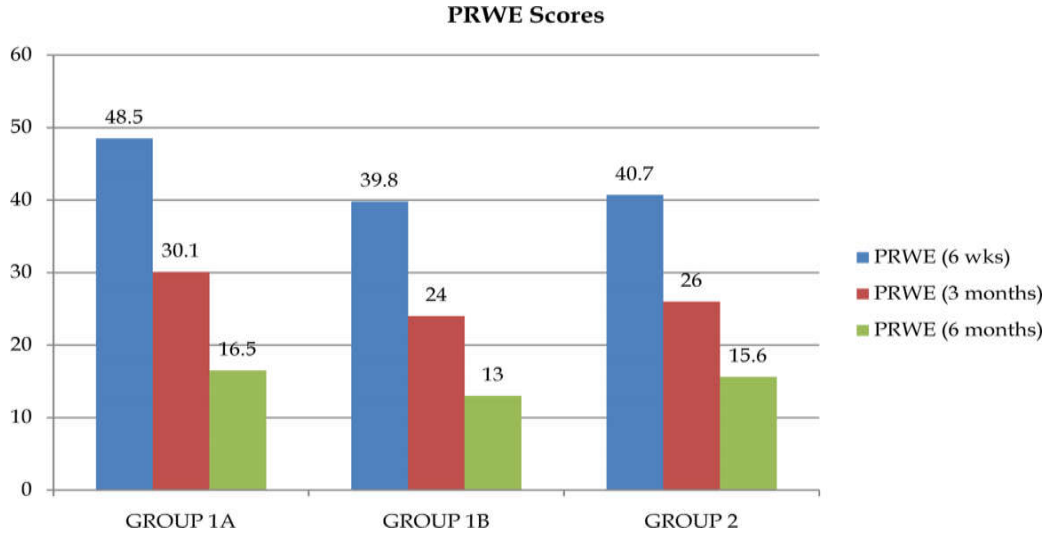
Groups	PRWE Score (6 wks)	PRWE Score (3 months)	Final PRWE Score (6 month)
Group 1A	48.5	30.1	16.5
Group 1B	39.8	24	13
Group 2	40.7	26	15.6

Patients in all groups had minimal functional disability as per PRWE subjective evaluation system at the end of 6 months.

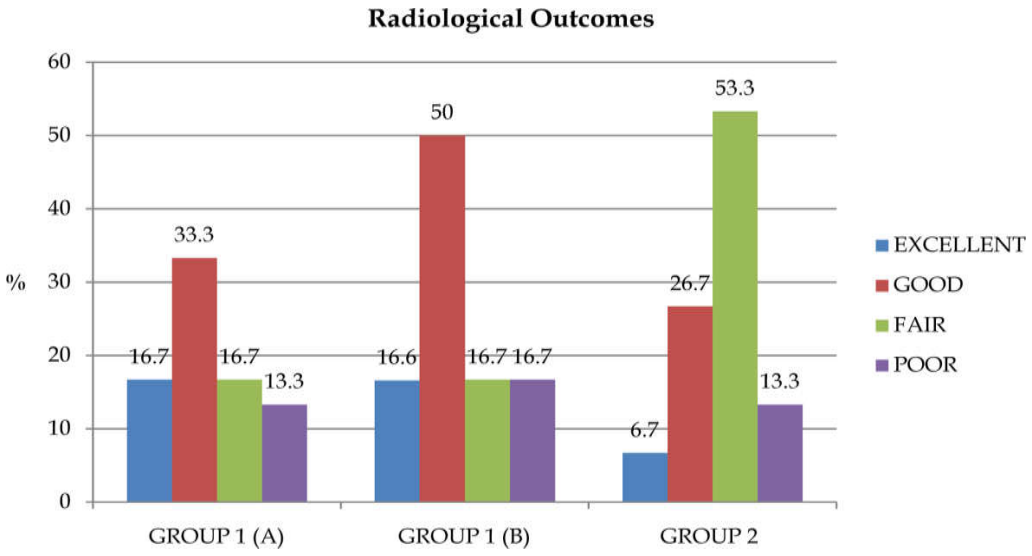
Table 2: Final Functional and Radiological Outcomes

Groups	Final Outcome (6 months)	Radiological Outcomes			
		Excellent	Good	Fair	Poor
Group 1 (A)	16.5	16.7	33.3	16.7	33.3
Group 1 (B)	13	16.6	50	16.7	16.7
Group 2	15.6	6.7	26.7	53.3	13.3

33.3% patients in group 1A had poor radiographic scores,50% patients in group 1B had good radiographic scores whereas in group 2 , 53.3% patients had fair radiographic scores. Patients in all groups had minimal functional disability as per PRWE scores.



Graph 1:



Graph 2:

Table 3: Final Mean PRWE Scores and Radiological Groups

Radiological Groups	No. of Cases	Final Mean PRWE Scores
Excellent	3	16.5
Good	9	13.7
Fair	10	16.4
Poor	5	14.5

Mean final PRWE score in excellent radiological group of patients were slightly worse (PRWE- 16.5) as compared to patients in poor radiological group (PRWE-14.5)

Graph 2:

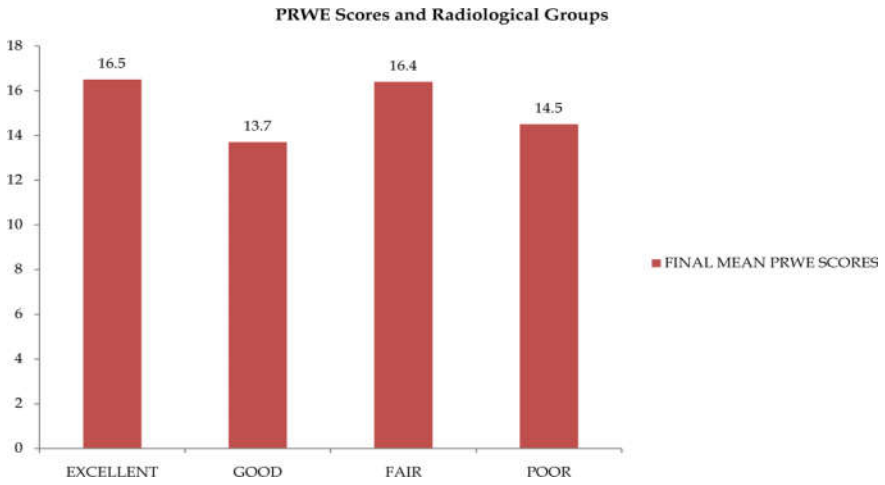


Fig. 1: 6 month FU

Fig. 2: Clinical 01

Fig. 3: Clinical 02

Fig. 4: Post Reduction AP

Fig. 5: Post Reduction Lat

Fig. 6: Pre Reduction AP

Fig. 7: Pre Reduction Lat

Discussion

Patients in all groups had minimal functional disability as per PRWE scores. Whatever radiological scores patients had, their functional outcomes were found satisfactory. McQueen and Casper reported no correlations between radiographic data and functional data [5]. Young and Rayan also reported no statistical correlation between radiographic outcomes and functional outcomes in a study on 25 sedentary, low-demand patients older than 60 years (mean 72 years) with displaced distal radius fractures and assessed by radiographic parameters, subjective and objective evaluation [6].

Alexander Anzarut et al reported that acceptable radiographic reduction was not associated with better generic physical or mental health status, lesser degrees of upper-extremity disability, or greater satisfaction with outcomes than was unacceptable reduction. Overall 44 of 74 patients (59%) reported being satisfied or very satisfied with their functional status at 6 months. Overall 47 patients (64%) were considered to have an acceptable radiographic reduction [4].

Our study had few limitations. All patients came from one tertiary care academic institution, and the results of the patient population and treatment preferences of this institution may not be generalized to other patients in this age group although age groups were comparable to other studies [4,6,7]. We observed patients over six months, which is perhaps not enough time to unmask major effects of certain potential complications of distal radius fracture, including posttraumatic arthritis, inter-carpal instability, and pseudosubluxation, which may occur as a result of long-standing major mal-alignment. However similar studies used comparable follow up period [4,8].

Conclusion

It is important to restore the anatomic alignment of the distal radius as normal as possible by any means, since anatomical restoration is a prerogative for good functional outcome, especially in the young active patient.

In elderly patients, patients having low functional demands or patients presenting to us late and not willing for any surgical treatment, mal-alignment and articular incongruence can be accepted, as radiological outcomes in this study does not correlate with the functional outcomes. For all other patients, anatomical restoration of the articular surface and the metaphyseal area must be the goal of treatment.

Our study concludes that elderly patients with unstable distal radius fractures who were managed conservatively had satisfactory functional outcomes.

References

1. Colles A. :On the fracture of the carpal extremity of the radius. Edinb Med Surg *J*, 2014, 10:182-186.
2. M. Garcia-Elias, M. Folgar : The management of wrist injuries: An international perspective. Injury 2006; 37(11):1049-1056.
3. Della Santa D., Sennwald G. : Is there aplace for conservative treatment for distal radius fractures in adults. Chir Main, 2001 Dec; 20(6):426-35.
4. Anzarut A, Johnson JA, Rowe BH, Lambert RG, Blitz S, Majumdar SR..: Radiologic and patient-reported functional outcomes in an elderly cohort with conservatively treated distal radius fractures. J Hand Surg Am. 2004; 29:11217.
5. McQueen M., Caspers J. :Colle's fracture: does the anatomical result affect the final function? J Bone Joint Surg Br. 1988; 70:649-651.
6. Young BT, Rayan GM. : Outcome following nonoperative treatment of displaced distal radius fractures in low-demand patients older than 60 years. J Hand Surg Am.2000; 25:19-28.
7. Jaremko JL, Lambert RG, Rowe BH, Johnson JA, Majumdar SR. : Do radiographic indices of distal radius fracture reduction predict outcomes in older adults receiving conservative treatment? ClinRadiol. 2007; 62:65-72.
8. Kapoor H, Agarwal A, Dhaon BK. : Displaced intra-articular fractures of distal radius: a comparative evaluation of results following closed reduction, external fixation and open reduction with internal fixation. Injury. 2000; 31:75–79.