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DISTAL RADIUS FRACTURE;
FUNCTIONAL OUTCOME IN PATIENTS WITH DISTAL RADIUS FRACTURE IRRESPECITIVE of RADIOLOGICAL DEFORMITIES

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ABSTRACT… Objectives: The objective of the study is to find out functional outcome in patients with distal radius fractures irrespective of radiographic deformities after close reduction and cast splint age. **Design:** Case series study. **Setting:** Department of Orthopedics and Spine Surgery, Hayatabad Medical Complex Peshawar. **Period:** May 2010 to April 2015. **Materials and Methods**: 28 consecutive patients of either sex with age above 40 years, having distal radius fracture. Functional outcome was assessed with disability of arm, shoulder and hand (DASH) and Patient Rated Wrist/Hand Evolution (PRWHE) questionnaire. **Results:** Out of 28 patients male were 12(42.9%) and female were 16(57.1%). minimum age was 40 maximum 81 and average was 50. Right side was involved in 17 (60.7%) while left side was involved in 11(39.3%). The DASH Score Record shows that no Disability was seen in 13(46.4%), Minimal Disability in 7(25%), Mild Disability in 5(17.9%), Moderate Disability in 1(3.6%) and Severe Disability in 2(7.1%) patients. While the PRWHE Score Record shows that no Disability was seen in 14(50%), Minimal Disability in 6(21.4%), Mild Disability in 5(17.9%), Moderate Disability in 1(3.6%) and Severe Disability in 2(7.1%) patients. **Conclusion:** A majority of the distal radius fractures can achieve good results after treatment by closed reduction and cast immobilization, for which conservative treatment should be the first choice. Deformity of the distal radius cannot affect the functional outcome of the wrist and hand.

Key words: Colles' Fracture, Radius, Closed Reduction, Cast immobilization, DASH, PRWHE.

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INTRODUCTION

In the French-speaking world Distal Radius Fractures (DRFs) were termed as Poteau fractures.[1]in the 1814 volume of the Edinburgh Medical Surgical Journal, the Irish surgeon Abraham Colles described DRFs. At that time radiography had not been invented and he based his descriptions on clinical examinations alone.[2]

Fractures of distal radius are the most common fracture of the upper extremity particularly extra-articular. This is because radius comprises approximately 80% of the wrist joint surface.[1]it bears nearly the full load of the body from a fall on the outstretched hand. These fractures are commonly occurred in the elderly population with osteoporosis and Abraham Colles described it as Colles' Fracture.[3]

These fractures are usually treated by closed reduction and immobilized in cast splint age for 6–8 weeks.[4]these fractures are usually unstable and may displace again[4]. Surgical treatment can improve anatomical reduction which may not be justified if functional outcome is not improved.[5]there are numerous studies that reported acceptable functional outcome irrespective of radiographic deformity.[6]

Most of orthopedic patients in this part of the world do not follow the proper protocol for their treatment then comes with complications associated with distal radius fractures which include post traumatic arthritis, loss of reduction, tendon rupture, and delayed union, nonunion, and malunion.[6,7]

Functional impairments of wrist or hand resulting from the distal radius fractures do not always reflect the displacement of the fracture radius.[7,9] This evolves the new strategy to measure the functions of wrist and hand in the form of questionnaires in patient himself evaluate of their own disability that are known as Disability of Arm, Shoulder and Hand Questionnaire (DASH)[4] and Patient-rated Wrist and Hand Evaluation (PRWHE).[10]

The objective of the study is to find out functional outcome in patients with distal radius fractures irrespective of radiographic deformities after close reduction and cast splint age.

MATERIALS AND METHODS

From May2010 to April 2015, eighty consecutive patients with distal radius fracture were enrolled prospectively at Department of Orthopedic and Spine Surgery Postgraduate Medical Institute Hayatabad Medical Complex Peshawar. We included patients with acute fracture of the distal radius treated with closed reduction and cast splint age in patient age above 40 years. The exclusion criteria were severe medical illness or cognitive disorder that may interfere in the follow-up examination, unwillingness to participate and those patient who have acceptable reduction at final follow up. We followed up the patients at 2 weeks, 6 weeks, 3 months and 6 months after reduction and at each visit we obtained standard anteroposterior and lateral radiographs and completed the PRWHE and DASH questionnairesat final follow up. Radiographic measurement of palmar (dorsal) tilt, radial inclination, radial height and intra-articular step was done at each visit. PRWHE and DASH score were the primary study outcome.

All patients were selected from Casualty. After stabilizing the patients, the purpose of the study was explained to them. Their concerns and reservations were addressed and their cooperation sought. Then informed written consent was taken. The method of treatment was closed reduction and splinting. Diazepam (Valium10mg) and tramadol (Tramal 50mg)were diluted and injected intravenously. Then traction was applied and fracture was manipulated to reduce into proper position. A plaster splint is applied in reduced position and then three point molding of splint was done on patient's forearm and hand. Then the hand is elevated in a sling to avoid swelling. At follow up standard poster anterior and lateral radiographs were obtained and evaluated by another consultant who do not know the DASH or PRWHE score of the patients for;

1) Radial inclination which is around 23º.
2) **Radial Length**: which should be 11 to 12 mm.
3) **Palmar (Volar) Tilt**: Average is around 11º and
4) **Intra-articular step-off**. After obtaining the radiological information only those patients were included who had at least one radiological abnormality like radial inclination or volar tilt etc. Out of eighty patients, twenty eight patients were lift with deformity and their functional outcome was assessed with PRWHE and DASH Score.

The DASH consists one part for activities of daily living (ADL), one part for social and work ability, one part for pain and another one for other symptoms. ADL is further subdivided into six parts and social and work ability into two parts. Each part has five options which are used to create a total score ranging of 100.

The PRWHE has two parts: one is pain and other function. Pain has five options which is rated from 0-10. The minimum is zero and maximum score in this section is 50. Function has two options namely specific activities (having 6 items) and usual activities (having 4 items). Each option is further subdivided into 10 options (0-10). Also in this section, the minimum score is zero and maximum is 50.

Patients can rate their level of disability with PRWHE from 0 to 10. There are 3 steps to score it; Measure the pain score of all 5 items, measure the function score of all the 10 items and divide it by 2 and add pain and function score equal to total score.

Gender of Patient					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	16	57.1	57.1	57.1
	Male	12	42.9	42.9	100.0
	Total	28	100.0	100.0	

Table-I

Side of involvement					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	11	39.3	39.3	39.3
	Male	17	60.7	60.7	100.0
	Total	28	100.0	100.0	

Table-II

DASH and PRWHE and ranges from zero (no disability or symptoms) to 100 (maximal disability or symptoms). These disability scores which was converted into groups of disability

no disability	(0-20)
minimal disability	(21 – 40)
mild disability	(41 – 60)
moderate disability	(61 – 80)
severe disability	(81 –100)

In this study questionnaires with more than three unanswered items were excluded.

The data was then collected with the help of a proforma which is constructed using different variables. Data was analyzed using SPSS version 10 and results presented as frequencies and mean values ± standard deviation in the form of graphs and tables.

RESULTS

There were 28 patients in which male were 12(42.9%) and female were 16(57.1%) Table-I. Minimum age was 40 maximum 81 and average was 50 (Std Deviation 10.892). Right side was involved in 17 (60.7%) while left side was involved in 11(39.3%) Table-II.

The DASH Score Record shows that no Disability was seen in 13(46.4%), Minimal Disability in 7(25%), Mild Disability in 5(17.9%), Moderate Disability in 1(3.6%) and Severe Disability in 2(7.1%) patients. While the PRWHE Score Record shows that no Disability was seen in 14(50%), Minimal Disability in 6(21.4%), Mild Disability in 5(17.9%), Moderate Disability in 1(3.6%) and Severe Disability in 2(7.1%) patients. Both these records were almost the same. (Figure-I).

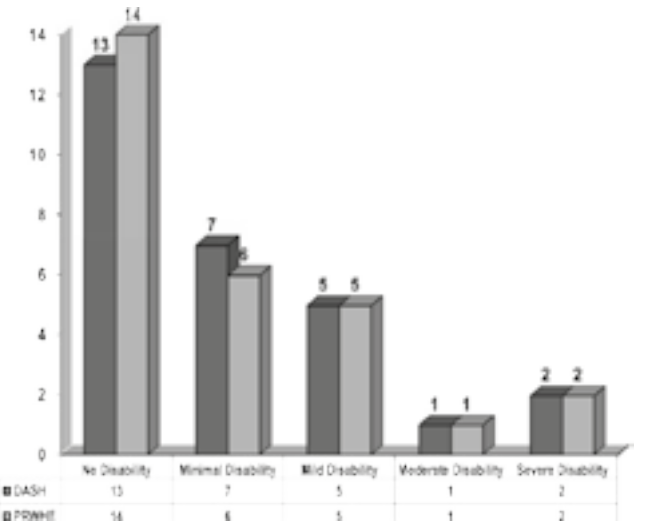

Figure-1. DASH and PRWHE Scores

DISCUSSION

Distal radius is the most frequent fractures managed by orthopedic surgeons. It has two peaks of prevalence: one around the first decade and the second around the fifth decade. The treatment objectives of distal radius fracture are the restoration of a pain-free unlimited durable functioning wrist and to avoid typical fracture complications.[11]generally non-operative management is employed for stable non-

displaced fractures of the distal radius with the expectation of a good functional outcome.[11]

Dario P et al study shows that majority of patients that has been managed conservatively had complete recovery of range of movements, with no significant difference ($p>0.05$) statistically in any movement of the wrist and hand compared with the other side. The final functional outcome may not be affected by variations within normal range of radiographic parameters in distal radius fractures.[12]

Knudsen R et al[13] retrospectively studied 165 patients of the distal radius fracture in whom 39(23.63%) had complications and 18% suffered from serious complications when treated with a volar locking plate. He was of the opinion of conservative management.

Gauresh[14] studied thirty patients treated none operatively and noted that 27 (90%) patients had good to excellent results, 3 (10%) had fair result. None of the patients in his series showed poor results.

Souer et al[15] studied 84 patients recovering from distal radius fracture showed that most of the patient complaints was pain but radiographic measures did not correlate with outcome function measured with the DASH.

Dowrick A et al[16]showed that DASH is a suitable measure that can be applied to all parts of the upper extremity. The results can be comparable to other studies of a similar kind involving other parts of the upper extremity. Radiographic and functional outcome has been studied by Young CF et al[17] and Young BT et al[18]and they were of the opinionthat functional outcome was not affected radiographic results. While comparing functional results with radiographic results, Kumar et al[19] found that patients had better functional results irrespective of radiographic deformities. In his series 72% of patients had satisfactory functional outcome.

CONCLUSION

In old age or non-dominant hand and low demand people some degree of deformity is acceptable as old age patients may have other co-morbidities they may not bear repeated or prolong orthopedic procedures. Rehabilitation after fracture and assessment of the functional outcome should be done meticulously irrespective of radiographic deformities to ensure better function of the hand and wrist.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

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3	Dr. Imran Khan	Data Collection	
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5	Dr. Abdul Sattar	Data Collection	