



## Original article

ACTA FAC MED NAISS 2006; 23 (4): 185-189

Viktor Kamiloski<sup>1</sup>  
Katerina Kasapinova<sup>1</sup>, Ivan Micic<sup>2</sup>

<sup>1</sup>Department of Traumatology,  
City Surgical Clinic Sv. Naum  
Ohridski, Skopje,  
Republic of Macedonia

<sup>2</sup>Clinic of Orthopaedic  
Surgery and Traumatology,  
Clinical Center Nis, Nis, Serbia

## UNSTABLE DISTAL RADIUS FRACTURES IN ELDERLY PATIENTS - OPERATE OR NOT?

## SUMMARY

The study evaluates the final outcome of the treatment of the distal radius fractures with external fixation in patients older than the age of 65.

Thirteen patients over 65 years with the distal radius fracture were treated with external fixation. The fracture type was determined according to the Frykman Classification. For the evaluation of the outcome, six months after the operation we used: the Stewart Score System, Gartland and Werley, and PRWE (Patient-rated wrist evaluation).

According to the Stewart Score System, one patient had excellent results, nine patients had good results and three patients had fair results. The Gartland and Werley Score showed that four patients had excellent results, six patients had good results and three patients had fair results. According to the PRWE, two patients had no pain and no functional disabilities; five patients had minimal pain; five patients had mild pain and functional disability; one patient had moderate degree and frequency of pain and moderate functional disability.

The external fixation of the distal radius fractures in patients in advanced age enables high degree of functioning of the injured wrist and high level of daily activities. Judging from the benefit in providing an "independency" of these persons, the risk of the operative treatment is sustained.

**Key words:** distal radius fracture, external fixation, PRWE, wrist pain, wrist function

## INTRODUCTION

Statistical data show that the world's population in 2004 amounted to 34.6 million persons older than the age of 65 - the so-called "senior citizens". This number is expected to grow to 50 million citizens by the year 2020, representing more than 16.5 % of the population. The records from the US Census in 1999 indicate that the average life span in 1970 was 70.8 years; in 2000, it was 76.4 years, while in 2010 it is expected to be 77.4 years (1). According to the US Census in 1999 referring to the independent

living, it was evident that out of the persons aged 65-74 years, 23% lived alone (without their marital partner), while there were 41% among those aged over 75 years (1). In the case that some of those sustain a distal radius fracture, the question appears in what way and in what degree this fracture should be stabilized in order to provide "an independency" of this age group.

Harris et al. published that in the UK 71.000 patients will have a distal radius fracture annually, also showing that the incidence for female is 36.8/10000 and 8.9/10000 for male (2). Margaret

McQueen and Court-Brown on the other hand found 145/100000 population annually, 224/ and 58/ distal radius fractures for female and male, respectively (3).

According to Thompson et al. the proportion of the female-male patients with distal radius fracture is 3.9:1, and the female incidence grows from 10/10.000 aged 60 years up to 120/10.000 aged over 60 years (4). The level of daily activities until recently has been interpreted and quantified incorrectly. It was considered that the elderly needed not a wide range of daily activities, nor the frequency of those activities was important. It was thought that the patients in advanced age needed a small range of activities (elementary use of the wrist joint) and that the frequency of performing those daily activities was small. This shows that the selection of the treatment method for the selected types of the distal radius fractures is in advance incorrectly determined as well as the final functional outcome that was considered enough if satisfactory (3,5).

The theory that the classical method of plaster casting gives traditionally good and functional results for all types of fractures in distal radius fractures, especially in the elderly is being abandoned more and more and has had a few adherents lately (5-8). The resistance for operating the patients in advanced age that have osteoporotic characteristics and poor general health condition is understandable, but it must not be the sole criterion in making the treatment decision.

According to Fujii et al. the loss of radial length by more than 6 mm affects the functional outcome and should be reduced and maintained less than 5 mm even in elderly patients (8).

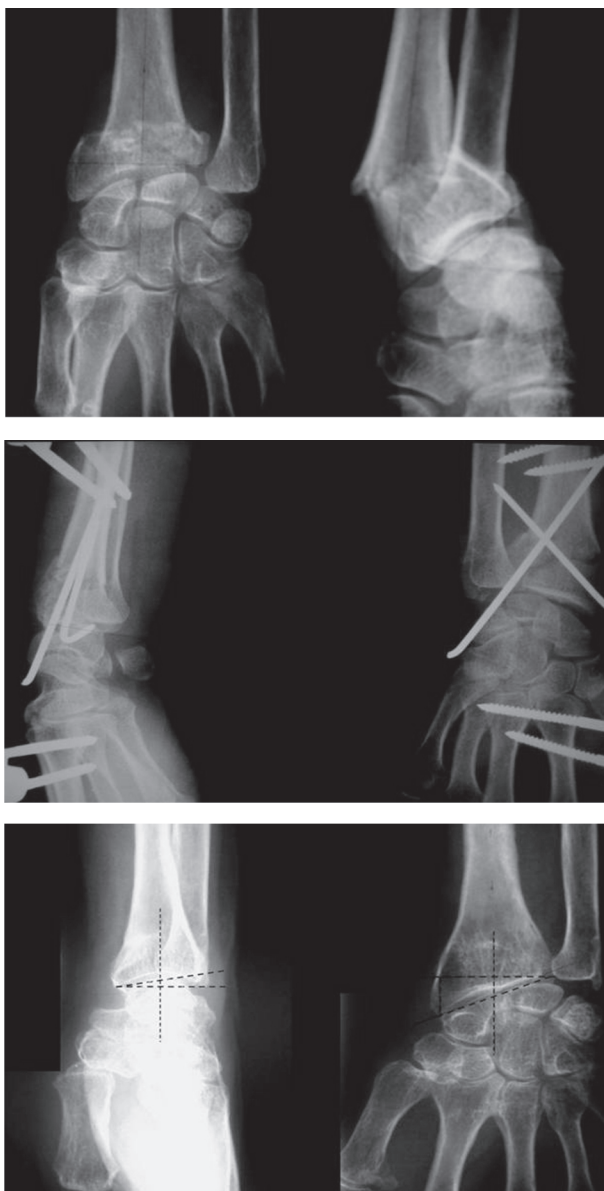
In patients in advanced age that have sustained a distal radius fracture, the age is not the only indicator of the functional needs and the level of daily activities of these patients.

The aim of this study was to examine the final outcome of the treatment of the distal radius fractures with external fixation in patients older than 65 years, using three different outcome measures: Stewart Score System, DPS (Gartland and Werley, Demerit Point System), and PRWE (Patient-rated wrist evaluation).

## MATERIAL AND METHODS

The study was conducted in the City Surgical Clinic Sv. Naum Ohridski-Skopje. It evaluates 13 patients over 65 years (65-83) with a distal radius fracture. The mechanism of injury is a fall on an outstretched arm in pronation. All of them were treated operatively with closed reduction and application of external fixator (AO ASIF distal radius fixator) on the wrist augmented by interfragmentary K-wires.

The external fixator is applied with the standard AO distal radius external fixation technique (*Figure 1 - a, b, c*).



*Figure 1- a, b, c. Distal radius fracture treated with external fixation; a. preoperative x-ray; b. postoperative x-ray; c. six months after the operation*

The type of the distal radius fracture is determined according to the Frykman Classification (9).

For the assessment of the outcome six months after the operation, three different outcome measurements were used:

- Stewart Score System – for radiological evaluation (10),
- Demerit point system DPS (Gartland and Werley) – for the assessment of objective and subjective characteristics of the injured wrist as well as the residual deformity (11),

- PRWE (Patient-rated wrist evaluation) as a measure of disability, in which the patient quantifies pain by himself, as well as the function of his wrist (12,13).

The PRWE contains 15 items: a 5-item pain subscale (4 questions refer to pain intensity and one to pain frequency), and 10 items for the injured wrist function (a 6-item specific activities subscale and a 4-item usual activities subscale). The total score ranges from 0-100 and refers to the wrist pain and disability.

## RESULTS

The study assessed 13 patients having sustained a distal radius fracture (DRF), aged over 65 years (Table 1). Out of them, 9 were female and 4 male. Concerning the involvement of the injured side, 8 were on the left side and 5 on the right one. The age distribution was as follows: four patients in the age group 65-69; two patients in the age group 70-74; four patients in the age group 75-79 and three patients in the age group > 80.

Table 1. Age distribution of the patients

Age	Number of patients
65-69	4
70-74	2
75-79	4
≥ 80	3

According to the classification of the fracture type, 5 patients had Frykman type VI and 8 patients had Frykman type VIII.

Assessment of the reduction quality and the anatomic position of the distal radius fracture six months after the operation was made with the Stewart Score System, when we found that three patients had the score from 4-6 points (fair), nine patients had 1-3 points (good) and one patient had the score 0 – zero (excellent).

Table 2. Stewart Score System and Gartland and Werley scoring six months after the operation

	Stewart Score System	Gartland and Werley Score
Result	number of patients	number of patients
Excellent	1	4
Good	9	6
Fair	3	3
Poor	0	0

With the DPS (Gartland and Werley), the following results were obtained: 4 patients had the score of 0-2 points, 6 patients had 3-8 points, and 3 patients had 9-20 points (Table 2).

The data on the outcome of the treatment of patients in this study referring to the PRWE are given in Figure 2.

Two patients had the score 0; 5 patients had the score 1-20; 5 patients had the score 21-40; and one patient had the score of 41-60 points.

Only one patient had mild pin-track infection which did not alter the final outcome.

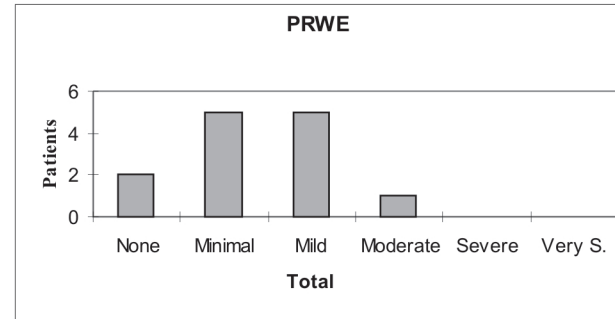


Figure 2. Distribution of patients according to the PRWE (Patient rated wrist evaluation) six months after the operation

## DISCUSSION

The distal radius fractures are common injuries causing pain and disability of the injured wrist. The majority of the studies reported in the past, no matter what the method of treatment was, focused on the impairment, the anatomic and functional characteristics of the wrist (range of motion in the wrist, grip strength) (8, 14). Contemporary studies are describing the pain and disability of the injured wrist joint in patients in advanced age that sustained distal radius fractures (5,15).

PRWE is a specific instrument for measurement of the outcome of the distal radius fracture. It gives information about the intensity as well as the frequency of the pain and the ability of performing daily activities (12). PRWE is a reliable, responsive and repeatable system for outcome measuring (it can be repeated during the phases of fracture healing) (13). This test can be performed immediately, even right after the external fixation of the wrist, contrary to the impairment measurements (of the physical condition of the wrist) that need some time to pass (for the fracture to heal, for the external fixator to be extracted, rehabilitation).

The indication for external fixation of the distal radius fractures not only encompasses the type of fracture, but also: the instability of fracture, inability of reduction, presence of metaphyseal comminution, presence of intra-articular fragments, presence of significant initial dislocation (dorsal angulation over 20 degrees, radial shortening more than 5mm and radial angle gradient more than 15 degrees), ul-

nar lesion (fracture of the styloid process of the ulna, triangular fibrocartilage complex tear or rupture of the radio-ulnar ligaments, ulnar fracture with or without comminution (9).

According to Lafontain (16), the presence of more than three criteria classify the distal radius fracture as unstable (1. dorsal angulation >20 degrees, 2. comminution, 3. radiocarpal fracture, 4. ulnar styloid fracture, 5. being over 60 years of age).

In our study, 5 patients had a VI fracture type and 8 patient had an VIII fracture type according to the Frykman Classification, which points to the fact that these were unstable intra-articular fractures (radio-carpal and distal radioulnar joint involvement) with significant metaphyseal comminution, primary dislocation (angulation, radial shortening), ulnar lesion (fracture of the ulnar styloid with or without TFCC tear) and osteoporotic characteristics.

The Stewart Score System in our study showed that three patients (23%) had fair score, nine patients or 69% had good and one patient or 7.7 % had excellent score. This indicates that the external fixation enabled retention and stabilization of the fracture in the period necessary for healing.

According to the DPS – Gartland and Werley scoring system that assesses subjective and objective characteristics as well as the residual deformities, 3 patients (23%) had fair results, 6 patients (46%) had good results and 4 patients (31%) had excellent results. Therefore, the external fixation of the DRF in elderly population over 65 years provided good functional and aesthetic outcome.

Six months after the operative intervention, the PRWE showed that two patients (15%) had no pain (regarding intensity and frequency) as well as any disability in performing specific and usual activities. In five patients (39%), there was minimal pain and minimal functional difficulties. While performing the daily activities, five patients (39%) had mild pain and mild functional difficulties. In one patient (7.7 % of the examined series), there was moderate and frequent pain and moderate difficulty in performing the daily activities. The external fixation in DRF in elderly patients resulted in lower intensity and frequency of pain in the injured wrist, as well as a good function of the wrist.

The patients with distal radius fractures, over 65 years should be individually evaluated not only with respect to the fracture type and its instability but as well as because of specific needs of this age group. The contemporary records for this older population emphasize the need for stabilization of the distal radius fracture, first of all because of the necessity of “independency”, and increasing the level of daily life activities (3, 5).

In elderly patients, there is an acceptable and sustainable risk of external fixation of the distal radius fractures compared to the benefit that would be obtained from the operative intervention. The possible complications are fewer compared to the advantage that this method of external fixation provides in the elderly. When making an indication for the operation of the distal radius fractures, we should also focus on the need and expectations of the elderly patients, as well as on their level of daily activities.

## CONCLUSION

Age should not be a limiting factor in the treatment of the distal radius fractures by means of external fixation. Elderly patients have their own specific needs that would enable their “independence”.

The external fixation in distal radius fractures in patients in advanced age enables high level of functioning of the injured wrist and high level of daily activities.

The existence of precise criteria and highly specific and sensitive test (Gartland and Werley, PRWE) for the outcome measurement in patients with the distal radius treated with external fixator make the evaluation objective and valid.

PRWE is a valid, reliable, responsive, patient-rated test for the patients with the distal radius fracture.

As professionals, we should recognize the demographic changes (the population continuously grows older), increased incidence of DRF and a change of the life style in elderly patients.

The treatment algorithm for the distal radius fractures in elderly patients needs to be re-evaluated.

## REFERENCES

1. US Census Bureau: Statistical Abstracts of the United States, 1999. Washington DC: US Census Bureau.
2. Harris JE, MacDermid JC, Roth J. The International Classification of Functioning and explanatory model of health after distal radius fracture: A cohort study. *Health and Quality of Life Outcomes* 2005; 3: 73.
3. McQueen MM, Court-Brown CM. Increasing age and fractures of the distal radius. *Current Orthopaedics* 2003; 17: 360-368.
4. Thompson PW, Taylor J, Dawson A. The annual incidence and seasonal variation of fractures of the distal radius in men and women over 25 years in Dorset, UK. *Injury* 2004; 35: 462-466.
5. Jupiter JB, Ring D, Weitzel PP. Surgical treatment of re-displaced fractures of the distal radius in patients older than 60 years. *Journal of Hand Surgery* 2002; 27A: 714-723.



6. Kamiloski V. Clinical and radiographic evaluation of the treatment of the radial fractures on typical place. Journal of Macedonian Medical Association 2001; 55 (1-2): 44-48.
7. Young CF, Nanu AM, Checketts RG. Seven-year outcome following Colles type distal radius fracture. A comparison of two treatment methods. Journal of Hand Surgery 2003; 28B(5): 422-426.
8. Fijii K, Henmi T, Kanematsu Y, Mishiro T, Sakai T, Terae T. Fractures of the distal end of radius in elderly patients: A comparative study of anatomical and functional results. Journal of Orthopaedic Surgery 2002; 10(1): 9-15.
9. Fernandez DL, Jupiter JB. Fractures of the distal radius. A practical approach to management. Springer, New York; 1996.
10. Stewart HD, Innes AR, Burke FD. Factor affecting the outcome of Colles fracture: an anatomical and functional study. Injury 1985; 16: 289-295.
11. Sarmiento A, Pratt GW, Berry NC, Sinclair WF. Colles fractures: functional bracing in supination. Journal of Bone and Joint Surgery 1975; 57A: 311-317.
12. MacDermid JC, Turgeon T, Richards RS, Beadle M, Roth JH. Patient Rating of Wrist Pain and Disability: A reliable and Valid Measurement Tool. Journal of Orthopaedic Trauma 1998; 19:37-48.
13. MacDermid JC, Roth JH, Richards RS. Pain and disability reported in the year following a distal radius fracture: A cohort study. BMC Musculoskeletal Disorders 2003; 4:24.
14. Beumer A, McQueen MM. Fractures of the distal radius in low-demand elderly patients. Acta Orthop Scand 2003; 74(1):98-100.
15. MacDermid JC, Richards RS, Roth JH. Distal radius fracture; a prospective outcome study of 275 patients. Journal of Hand Therapy. 2001; 14(2): 154-169.
16. Lafontaine M, Hardy D, Delince P. Stability assessment of distal radius fractures. Injury 1989; 20(4): 208-210.

## NESTABILNE FRAKTURE DISTALNOG RADIJUSA KOD STARIJIH PACIJENATA - OPERACIJA ILI NE?

Viktor Kamiloski<sup>1</sup>, Katerina Kasapinova<sup>1</sup>, Ivan Micić<sup>2</sup>

<sup>1</sup>Odeljenje za traumatologiju, Gradska hirurška klinika Sv. Naum Ohridski, Skoplje,  
Republika Makedonija

<sup>2</sup>Klinika za ortopedsku hirurgiju i traumatologiju, Klinički centar Niš, Srbija

### SAŽETAK

Ova studija procenjuje konačni ishod lečenja frakture distalnog radijusa metodom spoljašnje fiksacije kod pacijenata starijih od 65 godina.

Trinaest pacijenata starijih od 65 godina starosti sa frakturom distalnog radijusa lečeno je metodom spoljne fiksacije. Tip frakture je određen po Frikmanovoj klasifikaciji. Za procenu ishoda, šest meseci nakon operacije, koristili smo: Stewart Score System, Gartland and Werley i PRWE.

Po Stewart Score System-u, jedan pacijent je imao odlične rezultate, devet pacijenata je imalo dobre a tri pacijenta zadovoljavajuće rezultate. Gartland and Werley skor je pokazao da je četiri pacijenta imalo odlične rezultate; šest pacijenata je imalo dobre rezultate, a tri pacijenta zadovoljavajuće rezultate. Prema kriterijumima PRWE-a, kod dva pacijenta nije zabeleženo prisustvo bola ni funkcionalna nesposobnost; kod pet pacijenata je zabeležen minimalni bol; kod pet pacijenata je zabeležen umereni bol kao i funkcionalna nesposobnost; kod jednog pacijenta je zabeležen umereni stepen i učestalost bola i umerena funkcionalna nesposobnost.

Spoljašnja fiksacija fraktura distalnog radijusa kod starijih pacijenata omogućava visok stepen funkcionalnosti povređenog zgloba i visok nivo dnevnih aktivnosti. Sudeći prema koristi u pružanju "nezavisnosti" ovim licima, rizik operativnog tretmana je opravdan.

**Ključne reči:** fraktura distalnog radijusa, spoljna fiksacija, PRWE, bol u zglobu, funkcija zgloba