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= Abstract =

## Non-operative Treatment of Fracture of Distal Radius in Adults

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The authors analysed ninety-five cases of fracture of distal radius in adults with non-operative treatment followed for more than one year at Korea University Hospital from January 1991 to December 1996 to evaluate the clinical results according to the types of fracture by Fernandez classification and the methods of non-operative treatment.

The results obtained were as follows ;

1. Methods of treatment were closed reduction and cast immobilization in 51 cases(53.7%) and closed reduction and percutaneous pinning in 44 cases(46.3%).
2. In a group treated with closed reduction and cast immobilization, the results of subjective evaluation were excellent in 3.9%, good in 47.1%, fair in 45.1% and poor in 3.9%, and the results of objective evaluation were good in 42.8%, fair in 36.5%, and poor in 20.7%.
3. In a group treated with closed reduction and percutaneous pinning, the results of subjective evaluation were excellent in 6.8%, good in 54.5%, fair in 29.5% and poor in 9.2%, and the results of objective evaluation were excellent in 15%, good in 46.6%, fair in 35%, and poor in 3.4%.
4. The results of subjective evaluation according to fracture type were excellent and good in 91.3% of type I, 42.1% of type II, and 10% of type III, and the results of objective evaluation were excellent and good in 78.3% of type I, 52.6% of type II, and 3.5% of type III.

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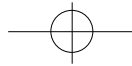
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5. The results of subjective and objective evaluation were not satisfactory in patients older than seventy years old.

Above results suggest that the clinical results of non-operative treatment were not satisfactory in type III, therefore external fixation or operative treatment is recommended.

**Key Words :** Fracture of distal radius, Fernandez classification, Non-operative treatment.

가 , 가 20 가 40 , 가 55 , 20 가 21 , 61 13 가 . 57 가 가 24 , 가 14 . Fernandez<sup>10)</sup> , 1 46 (47.4%), 2 19 (21.1%), 3 30 (31.5%) , 4 5 (Table 1). 가 51 (53.7%) , K- 44 (46.3%) (Table 2). 1 가 46 30 , 2 K- 30 19 (Table 3). Cole Obletz<sup>6)</sup> Fernandez<sup>10)</sup> X- Scheck<sup>21)</sup> 가 , 0 , 2 , 4 , 6 , 15 가 0 , 45 3 , , . X- 가 (volar tilt), (radial length), (radial inclination) 0 , 1 , 2 0-4 , 5-8 , 9-12 , 13-18 . Rank sum test .

**Table 1.** Classification of distal radius fractures

Fernandez type	No of cases	Percent
I	46	47.4
II	19	21.1
III	30	31.5
IV	0	0
V	0	0
Total	95	100

**Table 2.** Methods of treatment

Method	No of cases(%)
C/R and cast immobilization	51(53.7)
C/R and percutaneous pinning	44(46.3)

**Table 3.** Methods of treatment by type of fracture according to Fernandez

Type	C/R & cast	C/R & pinning	Total(%)
I	30	16	46(47.4)
II	10	9	19(21.1)
III	11	19	30(31.5)
IV	0	0	0
V	0	0	0

**Table 6.** The results of subjective evaluation according to fracture type

Type	Excellent	Good	Fair	Poor	Total
I	5	37	4	0	46
II	0	8	10	1	19
III	0	3	22	5	30

**Table 7.** The results of objective evaluation according to fracture type

Type	Excellent	Good	Fair	Poor	Total
I	6	30	10	0	46
II	0	10	6	3	19
III	0	1	18	11	30

1. 51  
(53.7%) 가 2  
(3.9%), 24 (47.1%), 23 (45.1%) 2  
(3.9%) , 가  
21 (42.8%), 19 (36.5%) 11 (20.7%)  
(Table 4,5, Fig 1-A,B,C).

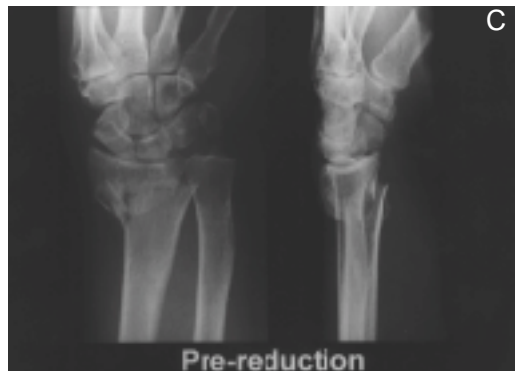
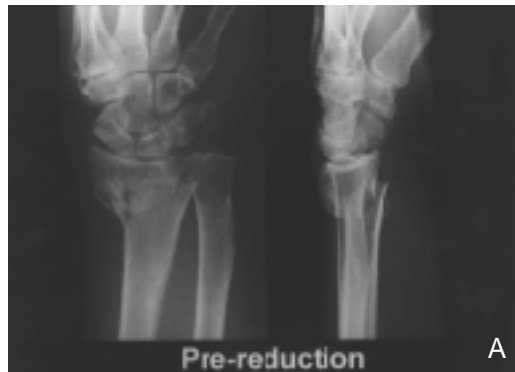
2. K- 44 (46.3%)  
가 3 (6.8%),  
24 (54.5%), 13 (29.5%) 4 (9.2%)  
, 가

**Table 4.** The results of subjective evaluation according to Cole and Oblatz method

Method	Excellent(%)	Good(%)	Fair(%)	Poor(%)	Total
C/R & cast immobilization	2(3.9)	24(47.1)	23(45.1)	2(3.9)	51
C/R & percutaneous pinning	3(6.8)	24(54.5)	13(29.5)	4(9.2)	44

**Table 5.** The results of objective evaluation according to Scheck method

Method	Excellent(%)	Good(%)	Fair(%)	Poor(%)	Total
C/R & cast immobilization	0	21(42.8)	19(36.5)	11(20.7)	51
C/R & percutaneous pinning	6(15)	20(46.6)	15(35)	3(3.3)	44



**Fig 1-A.** Initial X-rays (21-year old male) show dorsally displaced extraarticular fracture of the distal radius.

**B.** Immediate post-reduction and cast immobilization x-rays show slight anterior angulation.

**C.** Last follow up X-rays 12 months after reduction.



**Fig 2-A.** Initial X-rays (42-year old male) show intraarticular comminuted fracture of the distal radius.

**B.** X-rays of immediate post-reduction and percutaneous pinning.

**C.** Last follow up X-rays 12 months after reduction.



**Table 8.** The results of subjective evaluation according to age

Age	Excellent	Good	Fair	Poor	Total
20-30	2	17	12	0	31
31-40	1	9	8	0	18
41-50	1	16	5	1	23
51-60	1	3	5	0	9
61-70	0	3	3	1	7
> 71	0	0	3	4	7

**Table 9.** The results of objective evaluation according to age

Age	Excellent	Good	Fair	Poor	Total
20-30	3	13	14	1	31
31-40	1	10	6	1	18
41-50	0	16	5	2	23
51-60	2	2	4	1	9
61-70	0	0	3	4	7
> 71	0	0	2	5	7

1814 Colles<sup>5)</sup>가

, 가 , 가

Gartland Werley<sup>12)</sup>

Frykman<sup>11)</sup>

8가

Frykman

. Melone<sup>18)</sup>

4가

4가

. AO-ASIF

, 3

3

6 (15%), 20 (46.6%), 15 (35%)

3 (3.4%) (Table 4,5, Fig 2-A,B,C).

3. 가

1 46 42 (91.3%), 2 19 8

(42.1%), 3 30 3 (10%)

, 가 1 46

36 (78.3%), 2 19 10 (52.6%),

3 30 1 (3.3%)

(Table 6,7).

4. 가

20 31 19 (61.3%), 30 18

10 (55.5%), 40 23 17 (73.9%), 50

9 4 (44.4%), 60 7 3

(42.3%), 70 7

, 가 20 31

16 (51.6%), 30 18 11 (61.1%), 40

23 17 (73.9%), 50 9 4

(44.4%), 60 70 14

(Table 8,9).

Fernandez<sup>10)</sup>

5가 , 1)

(Colles Smith ), 2)

(Barton , ), 3)

(die-punch

, radial pilon ) 4)

5)

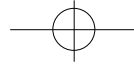
. Fernandez

95 ,

1 47.4%, 2

21.1%, 3 31.5%

, 4 5 .



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7,8) 10 , 6-8

, , , 6-8

, Kristiansen Ghersoe<sup>16)</sup> .

, Ellis<sup>9)</sup> .

Listrom<sup>17)</sup> 가

Frykman<sup>11)</sup> 가

, Knirk Jupiter<sup>15)</sup>

가 가

51 가

가 4) . , ,

가

44 K- Scheck 가

51

Paul<sup>20)</sup> 42.8%, 36.5%, 20.6% ,

가 44

61.6%, 35%, 3.3% .

가

Scheck<sup>21)</sup> Cole Oblatz<sup>6)</sup> 가

Frykman<sup>11)</sup>

, Smail<sup>22)</sup>

가 가 1,2,7) .

Fernandez<sup>10)</sup> 115

70%, Melone<sup>18)</sup>

K- 18.2%, 14.7% , Barcon

3 1/3 Kurtzke<sup>4)</sup> ,

K- , 2/3

가 1

10) . 1 46 91.3%, 2 42.5%, 3 10%

30 , 16 K- , 가

, 2 19 10 1 78.3%, 2 52.6%, 3

, 9 K- 3.3% 1

, 3 30 11 가 ,

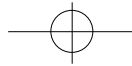
, 19 K- , 가 20, 30

Scheck K- 51% 59.2% , 70

, 49%

7 가 20, 30 55.2%

Jenkins<sup>2)</sup> 4 , Cooney , 70



7, 70

가 가

가  
가

1991	1	1996	12
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1 95

Fernandez 3

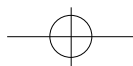
K-

가

가 .

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