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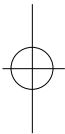
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= Abstract =

T-plate Fixation of Distal Radius Fractures in the Elderly

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Recently, distal radius fractures are recognized as very complex injuries with a variable prognosis according to the fracture type and the treatment. Especially, there are several problems, including joint stiffness and skin necrosis due to a long term immobilization, radial shortening and collapse due to the loss of reduction in the elderly. Thus, the anatomical reduction and rigid internal fixation and early rehabilitation were recommended.

We analyzed 16 patients with distal radius fractures in the elderly, who were treated with open reduction and internal fixation with T-plate from January, 1991 to June, 1997 and were followed up for more than 12 months.

The results were as follows ;

1. According to the Fernandez classification, 3 cases were type I, 3 cases were type II, 7 cases were type III, 1 case was type IV and 2 cases were type V.
2. As complications, there were 2 cases of arthritic change, 3 cases of radial shortening, and 1 case of screw loosening.
3. Anatomically satisfactory results were obtained in 75%(12 cases).
4. Functionally and clinically satisfactory results were obtained in 87%(14 cases).

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5. In the treatment of distal radius fractures in the elderly, three dimensional structure and recovery of joint congruency were related to the clinical prognosis.

Key Words : Distal radius fracture, T-plate fixation, The elderly

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4 (25%), 10 (62%),

2 (13%) , 3 (19%) .

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Fernandez¹⁷⁾ (Fig. 1) , I 3 , II
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Table 1. Point system for objective evaluation based on anatomical result by Scheck

Angle or length	Degree or mm	Results	Point
Radial inclination	18-23	Excellent	0
	10-17	Good	1
	< 10	Poor	2
Radial length	10-22	Excellent	0
	5-9	Good	1
	< 5	Poor	2
Volar tilt	6-11	Excellent	0
	0-6	Good	1
	Negative	Poor	2
Step-off	< 1	Excellent	0
	1 , <3	Good	1
	3	Poor	2

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1991	1	1997	6
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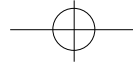
1	가 가	16
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가7 (44%), 가9 (56%) ,

50 가 8 (50%), 60 가 6 (37%), 70 가 2 (13%), 63 .

**Table 2.** Demerit point system used to evaluate end results

Items	Points
Residual deformity(range, 0 to 3 points)	
Prominent ulnar styloid	1
Residual dorsal tilt	2
Radial deviation of hand	2 to 3
Subjective evaluation(range, 0 to 6 points)	
Excellent : no pain, disability, or limitation of motion	0
Good : occasional pain, slight limitation of motion, no disability	2
Fair : occasional pain, some limitation of motion, feeling of weakness in wrist, no particular disability if careful, activities slightly restricted	4
Poor : pain, limitation of motion, disability, activities more or less markedly restricted	6
Objective evaluation*(range, 0 to 5 points)	
Loss of dorsiflexion	5
Loss of ulnar deviation	3
Loss of supination	2
Loss of palmar flexion	1
Loss of radial deviation	1
Loss of circumduction	1
Pain on distal radio-ulnar joint	1
Grip strength : 60% or less than on opposite side	1
Loss of pronation	2
Complications(range, 0 to 5 points)	
Arthritic change	
Minimum	1
Minimum with pain	3
Moderate	2
Moderate with pain	4
Severe	3
Severe with pain	5
Nerve complications(median)	1 to 3
Poor finger function due to cast	1 to 2
Final result(ranges of points)	
Excellent	0 to 2
Good	3 to 8
Fair	9 to 20
Poor	21 and above

* The objective evaluation is based on the following ranges of motion as being the minimum for normal function : dorsiflexion, 45 degrees; palmar flexion, 30 degrees; radial deviation, 15 degrees; pronation, 50 degrees; and supination, 50 degrees.



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Table 3. Arthritis grading

Grade	Findings
0	None
1	Slight joint-space narrowing
2	Marked joint-space narrowing, osteophyte formation
3	Bone-on-bone, osteophyte formation, cyst formation

Table 4. Final results by Sarmiento

Result	No. of cases
Excellent	4
Good	10
Fair	1
Poor	1
Total	16

Table 5. Final results by Scheck

Result	No. of cases
Excellent	3
Good	9
Fair	3
Poor	1
Total	16

Table 6. Complications

Complication	No. of cases
Arthritic change	2
mild	1
moderate	1
Radial shortening	3
Screw loosening	1
Total	6

Scheck²⁹⁾ 가

(Table 1)

(radial length)

(radial inclination)

(volar tilt)

(step off)

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, 7-8

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Samiento²⁸⁾

Demerit Point System(Table 2)

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Knirk Jupiter²⁴⁾

(Table 3).

Table 7. Final results by type

Type	Age/sex	Functional result	Anatomical result	Complication
	67/M	Excellent	Excellent	
	56/F	Excellent	Excellent	
	67/F	Excellent	Good	
	57/M	Good	Good	
	58/F	Good	Good	
	68/M	Good	Good	
	52/M	Excellent	Excellent	
	59/F	Good	Good	Arthritic change
	67/M	Good	Fair	Radial shortening
	58/F	Good	Good	Arthritic change
	72/M	Good	Good	Screw loosening
	59/F	Good	Good	
	64/F	Good	Fair	
	76/F	Good	Good	
	58/M	Fair	Fair	Radial shortening
	67/F	Poor	Poor	Radial shortening



가 4 (25%), 10 (63%), 1 (6%),
 1 (6%), 5 가 (Table
 4), 3
 (19%), 9 (56%), 3 (19%), 1 (6%)
 (Table 5). 16 6
 (37%), 2
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Fernandez 3

(Fig 2-A),

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(Fig 2-B). 14

(Fig 2-C),

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Fernandez 3

(Fig 3-A), T-

(Fig 3-B). 13

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C),



Fig. 1. Five types of distal radius fractures

type I Bending fracture of metaphysis

type II Shearing fracture of the joint as Barton, radial styloid

type III Impaction fracture of the joint with impaction of subchondral and metaphyseal bone

type IV Avulsion fracture of ligament attachment, including radiocarpal dislocation

type V High velocity injury combination of bending, compression, shearing and avulsion mechanism

Fernandez¹⁷⁾

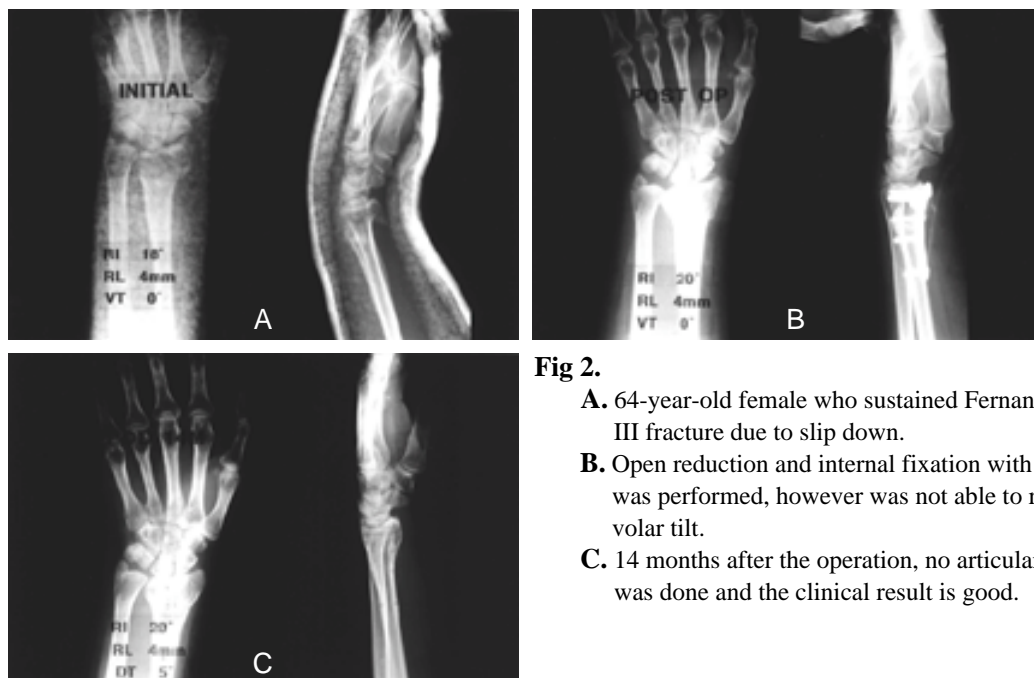
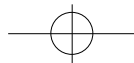


Fig 2.

- A.** 64-year-old female who sustained Fernandez type III fracture due to slip down.
B. Open reduction and internal fixation with T-plate was performed, however was not able to restore the volar tilt.
C. 14 months after the operation, no articular step off was done and the clinical result is good.

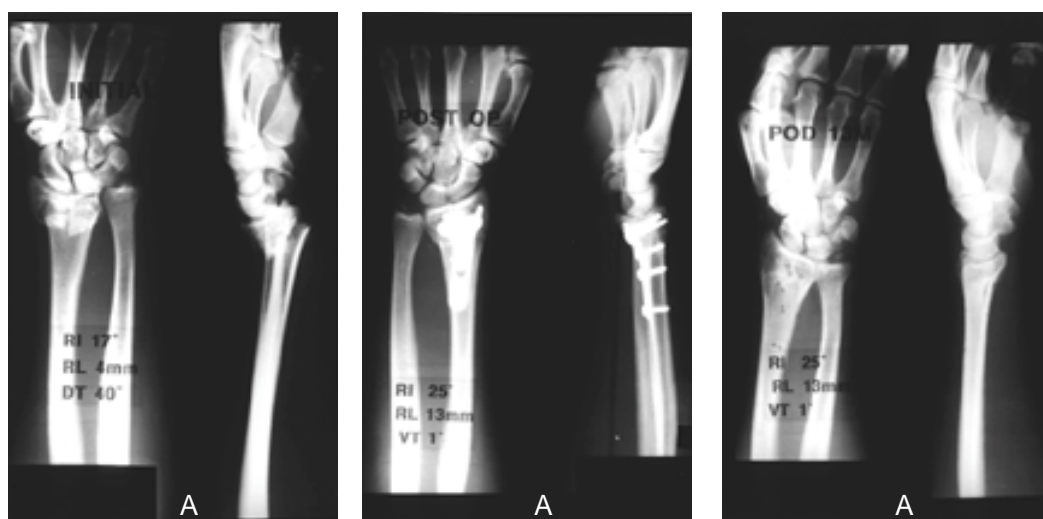


Fig 3.

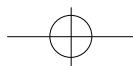
- A.** 52-year-old male who sustained Fernandez type III fracture due to traffic accident.
B. Open reduction and internal fixation with T-plate was performed.
C. 13 months after the operation, roentgenogram shows union of fracture and the clinical result is excellent.

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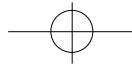
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 , 5 , 16 14
 , (dorsal tilting)
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 , Green²³⁾ 가
 . Solgaard³⁰⁾ 가 6-8 , Scheck²⁹⁾
 , 4 , , Anderson⁷⁾
 가 5 2 가 ,
 3 , 1 , 1 , Fernandez¹⁸⁾ 8-12
 6mm (ulnocarpal ,
 impingement) 가 2-4 ,
 , 3 2 . Bassett⁹⁾
 6mm , ,
 가 , Knirk Jupiter²⁴⁾ 2mm ,
 step off가 100% ,
 2/3가 ,
 2mm step off가 2 Melone²⁶⁾ ,



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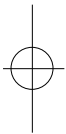
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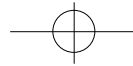
4. 가 4 ,
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Green²¹⁾ .
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Zagorski³²⁾ .
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Sudeck's atrophy,
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16
1.
3 (19%), 2
3 (19%), 3 7 (43%), 4 1
(6%), 5 2 (13%) (Fernandez).
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3 가 3 , 가 9 ,
3 , 1 75%

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