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65

- Ender nail -

= Abstract =

## The Results of Surgical Treatment of Intertrochanteric Fractures in the Elderly Patients Aged over 65 years

### - Comparative Study between Compression Hip Screw and Ender Nail Fixation -

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**Objectives:** To analyse the comparative results of surgical treatment with compressive hip screw or Ender nail for intertrochanteric fracture in aged over 65 years.

**Materials & Methods :** From June 1990 to December 1997, 39 of 55 patients who were operated with compression hip screw or Ender nailing and followed up for more than 1 year. A retrospective survey was completed for 39 intertrochanteric fractures which were operated with compressive hip screw(22 patients, Group 1) or Ender nail(17 patients, Group 2). There was an average follow up of 48 months, with a range of 12 to 84 months. Radiographic measurements were performed in aspects of osteoporosis and fracture classification. Clinical evaluation of follow up was measured as Clawson 's evaluation according to the fracture classification and

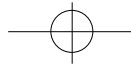
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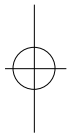


types of fixation. 23 of 39 cases(59%) were unstable and 26 of 39 cases(66.6%) showed below grade in osteoporosis. Age, cause of fracture, fracture classification, accompanying diseases and Singh 's index were identical to both group.

**Results:** The mean radiologic bone union period was 16.4 weeks. The rate of complication was 7cases(31.8%) in group I and 8cases(47.0%) in group II. The rate of mortality was 3cases(13.6%) in group I and 3cases(17.6%) in group II. Satisfactory rate was 20 of 22cases(90.9 %) in group and 14 of 17cases(82.3%) in group .

**Conclusion:** We suppose that compressive hip screw fixation for the elderly over 65 years who had intertrochanteric fracture and medical problem, produced good results as comparing to Ender nail fixation. The clinical satisfactory rate were superior in the compressive hip screw group comparing to Ender nail group. Cement fixation for eldly could help to fixate more in compression hip screw.

**Key Words :** Femur, Interttrochanteric fracture, Compressive hip screw, Ender nail



	1990	6	1997	12		65	84
2,3,5,7)					Ender nail		
가			55	12			가
	가	39					
2,3,5,7). Jewett plate, Ender nail, Gamma			22	1	, Ender nail		
nail, compression hip screw,		17	2		,		
						Clawson	
가	가						
5).	1990	6	1997	12			
	65						
				12	1.		
가 가	39				39	1	22
22	1	Ender nail	17	2	(72.7%)	2	6 (27.3%), 16
					(76%)		4 (24%), 13
						1	68 , 86
						75.2	2 66 ,
					90	80.5	. 39 1
						9 (40.9%),	13 (59.1%)
						2	11
					(65%),	6 (35%)	



**Table 1.** Associated disease

	Compression hip screw	Ender nail	Total
Pulmonary disease	14	12	26
Hypertension	4	2	6
CVA* sequelae	3	1	4
Renal disease	1	1	2
Parkinson 's disease	0	1	1
Gastric ulcer	1	0	1
Liver disease	2	2	4
Thyroid disease	1	1	2
Diabetes melitus	2	4	6
Heart disease	1	2	3
Anemia	3	1	4
Dementia	2	3	5
G-B** stone	1	0	1
Total	35	30	39

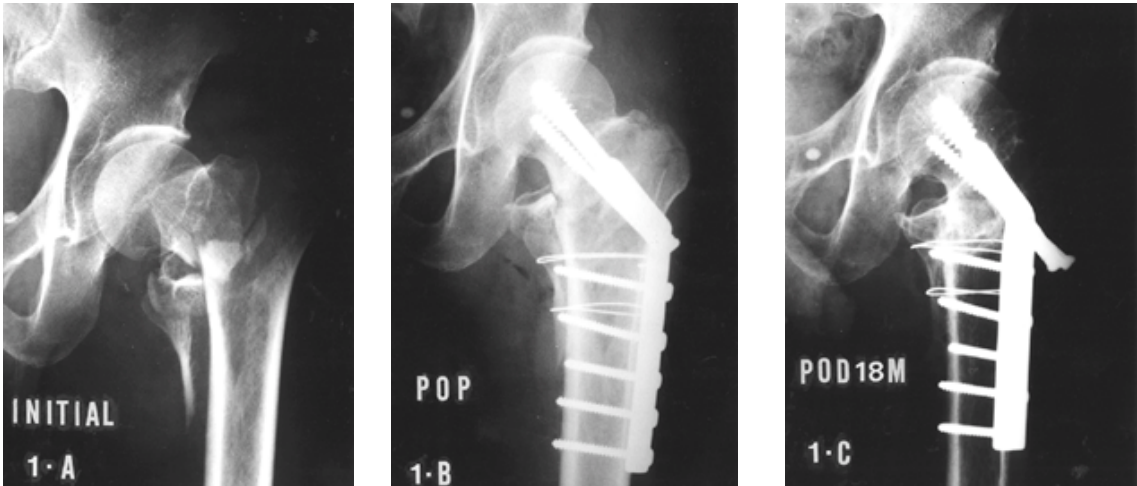
\*CVA: Cerebral Vascular Accident

\*\*G-B: Gall Bladder

**Table 2.** Type of fracture(by Evans-Jensen)

Type\Fixation device	Compression hip screw	Ender Nail	Total
Stable I-A	0	0	0
I-B	10	6	16
Unstable -A	3	2	5
-B	4	5	9
	5	4	9
Total	22	17	39

2. 가 ,
- 39 37 가 (Table 1).
- (94.9%) 2 (5.1%) .
- 4.
3. , Evans-Jensen
- 1 22 17 (77.2%) 20) 1 10 (45.6%)
- 14 , 4 , , , 12 (54.4%)
- 3 , , , 가 2 , (Fig.1- A), 2 6 (35.3%)
- , , , , , 11 (64.7%)
- 1 . 2 17 16 (Fig.2- A)(Table 2).
- (94%) 12 ,
- 4 , 3 , , ,
- 5.
- 2 , , , , , Singh's index 1 2
- 1 . (9.1%), 12 (54.6%), 7 (31.8%), 1



**Fig 1-A.** 67 years old male intertrochanteric fracture showed Evans-Jensen type      and Singh index      in osteoporosis.  
**1-B.** Postoperative radiographs with internal fixation of CHS augmented a cannulated screw and 2 cerclage wirings.  
**1-C.** Postoperative 18 months radiographs showing solid union and increased bone quality, shortening of femur neck, lag and cannulated screws migrated laterally for 25mm in length.

**Table 3.** Relationship between Singh index and fixation groups

Singh index	Compression hip screw	Ender nail	Total
	0	0	0
	2	2	4
	12	10	22
	7	5	12
	1	0	1
	0	0	0
Total	22	17	39

(4.5%)      2      2 (11.8%),      10      Ender nail  
(58.8%),      5 (29.4%)      가 (Fig.2-B).  
.      ( , , )      1      가  
14 (63.6%),      2      12 (70.6%)      ,      1  
( , , )      1      8 (36.4%),      2      2 ,      13      6.9  
5 (29.4%)      ,      2      1 ,      12  
(Table 3).      5.9 .  
6.      7.  
가      1      1      가  
(Fig.2-B),      가      ,      가



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wheel chair . 2 ,

4

. 1

9 . Class 1

. 2 1

2

4

가 6-8 가

12

Class 가 Good(Fig.1-

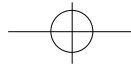
8. C, 2-C) 가 , Class가 1

Moderate, 2 Poor 가 .

**Table 4.** Relationships between complications and fixation groups

	Compression hip screw	Ender nail	Total
Proximal migration	0	5	5
Lag screw loosening	4	0	4
Limb shortening( 2Cm)	0	0	0
Transient peroneal nerve palsy	1	0	1
LOM of hip and knee	2	3	5
Total	7	8	15

**Fig 2-A.** 79 years old female intertrochanteric fracture showed Evans-Jensen type II-B and Singh index III in osteoporosis.**2-B.** Postoperative radiographs with internal fixation of 4 Ender nails.**2-C.** Postoperative 66 months radiographs showing solid union and increased bone quality but proximal migration of nail.



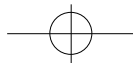
Moderate 7 (31.8%), Poor 2 (9.1%), 2  
 Good 8 (47%), Moderate 6 (35%), Poor 3 (18%)  
 1. . Good Moderate  
 1 20 (90.9%), 2 14 (82%)  
 17 15.3 , 2 1  
 15 17 가 cement 9  
 16.4 (Table 5).  
 2.  
 1 lag screw loosening 4 (Fig.1-B, C),  
 2 ,  
 1 7 (31.8%) 2 Ender nail  
 5 ,  
 3 8 (47.0%) (Table 4). 가 ,  
 가 65  
 3.  
 39 3 4 (10.3%), 1 6  
 (15.4%) 3 , ,  
 2 , 1 , 가  
 1 가 12 1,4,12,13,16,27)  
 6 (15.4%) 가  
 3 10.3%, 1 가  
 25.7% . 1 가  
 3 (13.6%), 2 3 (17.6%) . Kyle 24) 가 58%  
 가 1.5-1.9  
 4. 1-7,14,16,17) 65  
 가 1 Class 2가 2  
 (9.1%), Class 3 5 (22.7%) Class 4 15 (68.2%) 29 (74.4%), 13 (25.6%)  
 , 2 Class 2가 2 (11.8%), Class 3 6 2.9 : 1 가 1  
 (35.3%), Class 4 9 (52.9%) 12 75.2 , 2 80.5  
 가 1 Good 13 (59.1%),

**Table 5.** Evaluation of walking ability by Clawson according to fixation device

	CHS*	CHS* with BC**	Ender nail	Total
Good	7	6	8	21
Moderate	4	3	6	13
Poor	2	0	3	5
Total	13	9	17	39

\*CHS: Compression hip screw

\*\*BC: Bone cement



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가 9%

1,3,12,24,27) . 가 (Evans-Jensen IIA IIB )

3,4,23) , 39 37 (94.9%) 33% 21%

2 (5.1%) . 55% 61%

Boyd Griffin<sup>9)</sup>, Evans<sup>17)</sup>, Tronzo<sup>32)</sup> Evans-Jensen III 8%

Evans 78%

Evans-Jensen <sup>20)</sup> ( 가 <sup>20)</sup> II, III

A, B ) 16 (34.1%), II 13 1/3

(33.3%), III 10 (25.6%) . 1/2

65

70%

Singh's index<sup>31)</sup>

grade 가 26

(66.6%) 3-7)

가

10,11,15,16,21)

가 8,13,30,33) 65

IIA,B III Singh's index IV 가

1,4-6,24) 4가

, lag screw , Ender nail ,

, Ender nail ,

10-13,19,25,26,28-30) .

9-11,17,21) reaming

39

25 (64.1%), 6

(15.3), 5 (12.8%), 4 (10.2%), 4

(10.2%), 2 (5.1%), 4 (10.2%),

3 (2.6%), 1 (

2.6%), , 1

( 2.6%) .

가 . 가 5,13,25) 65

Singh's index가

(Evans-Jensen IA IB ) reaming tapping

Jensen Michaelsen<sup>20)</sup> 94%



(22 9 ) 3

reaming tapper 10.3%

polymethyl methacrylate(PMMA) 가 Clawson 가<sup>9)</sup>,

lag screw tube plate Koval<sup>23)</sup> 가

가 . Tapering 가

tapper Clawson 가<sup>9)</sup>

lag screw 5)

91.6%,<sup>6)</sup> 71%,<sup>7)</sup> 47%

가 ,

1-2 cm 49-61%

tapper tapping . × 5,7,23). 1 20 (90.9%), 2

1995 14 (82%)

Ender nail . 1 cement 9

Ender nail

Ender nail

Ender nail 1 °

wire cancellous washer ,

2

Ender nail , Ender nail 4

, Ender nail

2-3mm

2

1) 6 1990 6 1997 12

5 2) 65

14%, 31.8% 55

7) 9%, Ender nail 가 , 12

31.3% 가 가 39 22

Ender nail 17 가

11 (47.8%)

Dahl<sup>12)</sup> 2 Primary

mortality 17%, 10% 1. 29 (74.3%), 10 (25.7%)

3) 3 15% , Fitts 2.9 : 1 가 , Evans-Jensen

18) 6 24%, 1 ( AB ) 16 (41%),

11%-22.7%<sup>1,4,5,7)</sup>, 1 IIA IIB 13 (33.3%), III 10

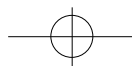
27% 9,12,13,24,28). (25.6%)

39 3 4 75.2 , Ender nail 80.5

(10.3%), 1 6 (15.4%) 2.

가 ,



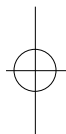


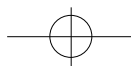
3. 22 20 (90.9%)가  
Ender nail 17 14 (82.3%)

가 .

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