

.

[]

:
 : 1 가 11
 Garden 1 3 , 2 6 , 3 1 , 4 1 . 가
 7 , 가 4 . 22 54 38 33 11 가
 가 , 가
 : Ender 8 , 1
 2 , 1 , 1 ,
 3 220 , 180 ,
 5 200
 Ender 1
 1
 가 2 (Ender 1 Ender 1)
 Ender 1

:
 791-100, 69-7
 : (054) 245-5161, Fax: (054) 245-5311
 e-mail: oskwon@hanmail.net

Ender

Ender

가 .
가

가

1
3

1 10 가

가 2

Ender 3

Ender

3~4

(CPM)

가

11 3

2. 가

13 84 33

가 가 가

1991 2 2001 10

1 가 가

11 (Table 1).

1.

가 3

가

6

Table 1. Case analysis

Case	Sex / Age	Femur Neck Fx. Garden's	Femur Shaft Fx. Site	Femur Shaft Fx. Gustilo	Missed Dx. of Femur Neck Fx.	Associated Injuries	Method of Treatment	Complication
1	M/37	III	Distal 1/3 (Lt)		-	Fx. Tibia shaft (Rt)	MP/supracondylar nail	
2	M/37	I	Distal 1/3 (Lt)		-	Fx. Femur (Rt) Fx. Radius (Rt)	MP/supracondylar nail	Non-union
3	M/43	II	Distal 1/3 (Rt)		-	Open Fx. Tibia (Lt) Fx. Humerus (Rt) Open fx. Ankle (Lt)	DHS/Supracondylar nail	
4	M/37	II	Middle 1/3 (Lt)	Type I	-	Fx. Femur (Rt) Fx. Humerus (Lt) Fx. Radius & ulnar (Lt)	MP/supracondylar nail	
5	M/22	I	Middle 1/3 (Lt)	Type I	-		MP/endermail	Knee pain
6	M/39	II	Middle 1/3 (Lt)		-	Fx. Radius & ulnar (Lt)	R IM nail	Neck reduction loss
7	M/30	II	Middle 1/3 (Lt)	Type I	-	Fx. Patellar (Lt)	MP/endermail	
8	M/26	I	Middle 1/3 (Lt)		-	Fx. Patellar (Lt)	R IM nail	
9	M/43	II	Middle 1/3 (Lt)		+	Open Fx. Patellar (Lt)	MP/DCP	AVN
10	M/54	IV	Distal 1/3 (Rt)	Type IIIa	-	Fx. Patellar (Rt) Open Fx. Tibia (Rt) Fx. Radius & ulnar (Rt)	MP/endermail	Non-union AVN
11	M/51	II	Middle 1/3 (Lt)		-	Fx. Ankle (Lt)	MP/endermail	

MP: multiple pinning, DCP: dynamic compression plate, AVN: avascular necrosis, R IM nail: reconstruction IM nail, DHS: dynamic hip screw

10 가 4 가 가 Winquist-Hansen I 2 , II 3 , III 2 , IV 4 Gustilo and Anderson I 3 , IIIb 1 . 11 10 4 , 3 , 2 , 2 , 2 , 11 가 22 4 , 3 , 54 38 . 1 . 10 가 1 . 2 Garden 1 3 , 2 9 6 , 3 1 , 4 1 가 8 , 가 7 , 3 , 7 (

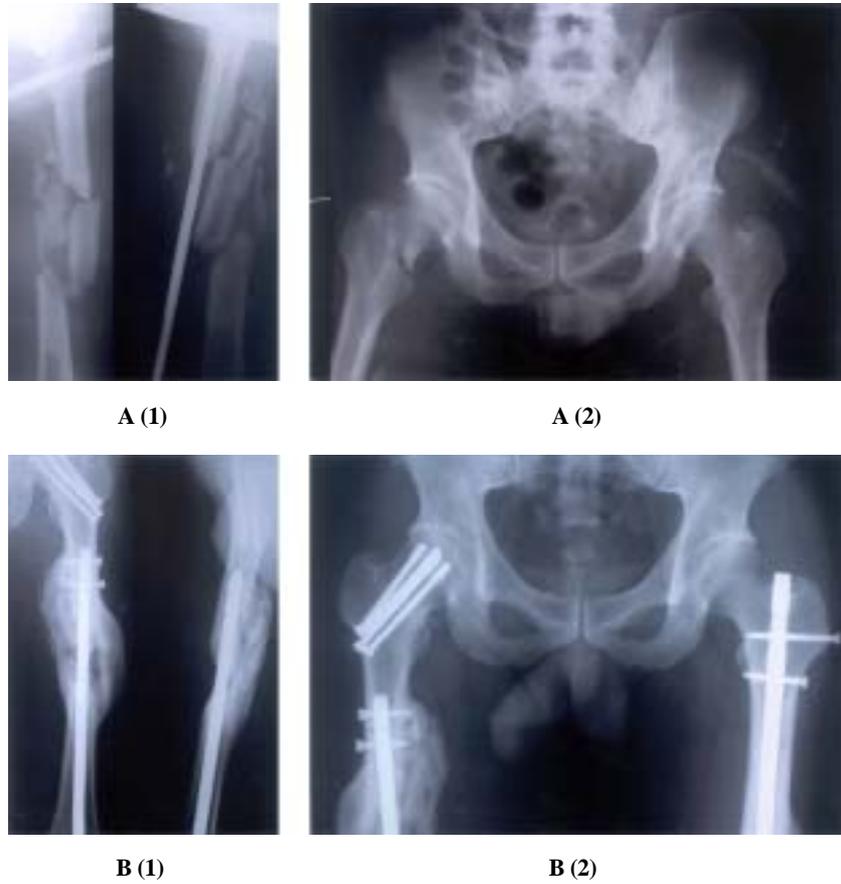


Fig. 1. 37 year old male patient was injured by a traffic accident.
1A. Initial roentgenogram shows ipsilateral femoral shaft comminuted & neck fracture.
1B. The roentgenogram at 2 years after intramedullary supracondylar nailing & multiple pinning shows a complete union has achieved.

(Fig. 1A, B).
 4 , Ender 3) 200 .
 1
 가
 7 Ender 3 , 5 ,
 1 , 2 , ,
 1 4 2 (Ender 1) 1
 1)
 3 가 ,
 가 180 , der 1 En-
 220 , 가 Ender

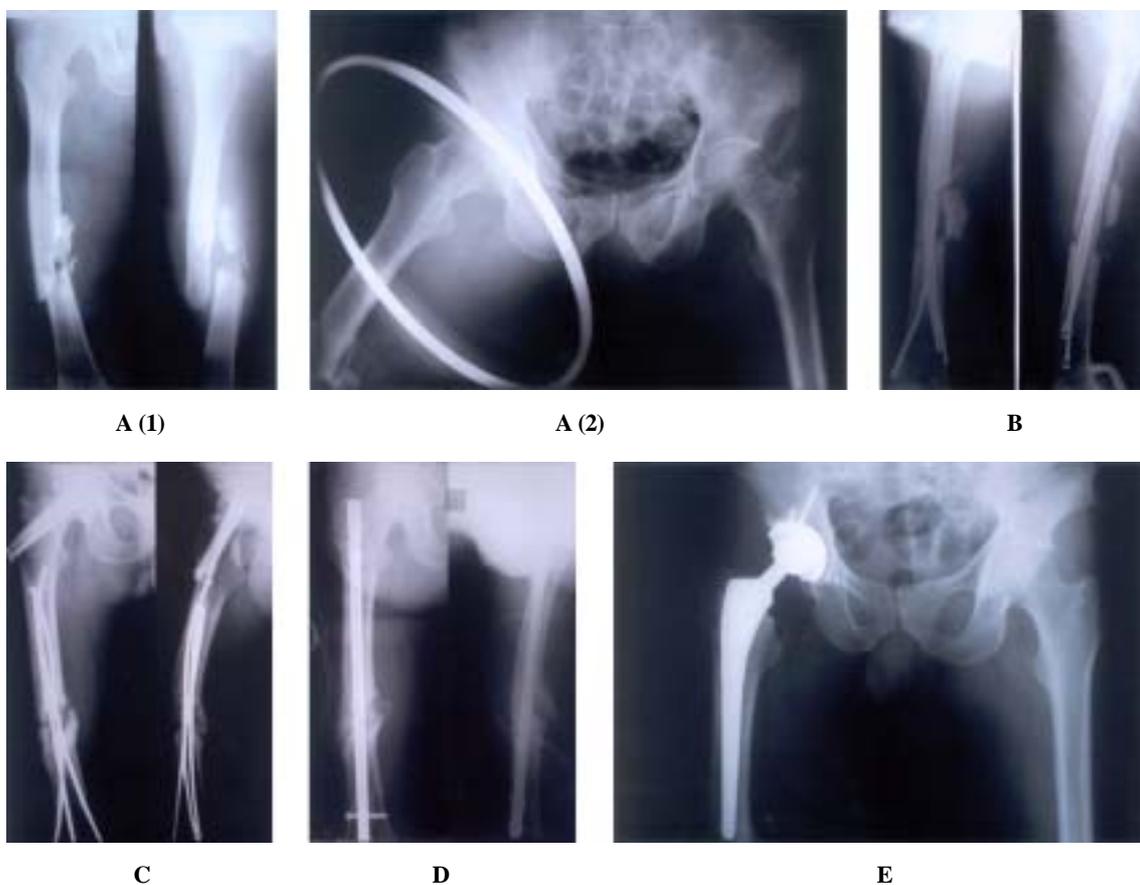


Fig. 2. 54 year old male patient was injured by a traffic accident.
2A. Initial roentgenogram shows ipsilateral femoral neck & shaft fracture.
2B. The postoperative roentgenogram after retrograde endernailing & multiple pinning.
2C. Roentgenogram at 3 years after operation shows nonunion of femoral shaft and broken endernails.
2D. The postoperative roentgenogram after removal of endernail & CCS and anterograde interlocking intramedullary nailing.
2E. The roentgenogram at 6 years after traffic accident show total hip replacement due to avascular necrosis of femoral head.

Ender 1 17)

(Fig. 2A~E).

가 1-3,10,12),

2.3~6% 11)

가 가

가

. Wiss ¹⁶⁾

18%

Henry Seligson⁵⁾
20~30%

가

. 4), 12)

2

Schatzker Barrington¹³⁾, Wollinsky Johnson¹⁷⁾

1 가

가

3), 4), 8), 6)
Mackenzie¹⁰⁾ Swiontko-

Ender

2가

Ender

wski¹⁵⁾

9)

3

1

가

1970 Mackenzie¹⁰⁾

45%
10~15%

Chapman²⁾ 4.5%, Swiontkowski¹⁵⁾
가

15~

(3)

1 Ender

1974 Bern-

1

stein¹⁾

. 1984

Swiontkowski¹⁵⁾

가

가

2 (Ender
1)

1 ,

En-

가

der

1

가

REFERENCES

- 1) **Bernstein SM:** Fracture of the femoral shaft and associated ipsilateral fractures of hip. *Orthop Clin N Am*, 5: 799-817, 1974.
- 2) **Casey MJ and Chapman MW:** Ipsilateral concomitant fracture of the hip and femoral shaft. *J Bone Joint Surg Am*, 61: 503-509, 1979.
- 3) **Cha SG, Rhi WS, Kim JI, Park JS and Kim KY:** Concomitant Ipsilateral Femur Neck Fracture Associated with Comminuted Femur Shaft Fracture - Clinical Review of Four Cases - *The Journal of the Korean Orthopaedic Surgery*, 25-6: 1674-1680, 1990.
- 4) **Choy WS, Shin HD, Kim WJ, Kim NH, Lee KW and Nah KS:** Ipsilateral Fractures of the Femoral Neck and Shaft. *The Journal of the Korean Orthopaedic Surgery*, 29-4: 1238-1244, 1994.
- 5) **Henry SL and Seligson D:** Ipsilateral femoral neck-shaft fractures: A comparison of therapeutic devices. *Orthop Trans*, 14: 269, 1990.
- 6) **Kim BH, Sohn SK and Park SJ:** Ipsilateral fractures of femoral neck and shaft. *J of Korean Society of Fractures*, 12-1: 14-20, 1999.
- 7) **Kim JK, Kim CH and Kim DH:** Ipsilateral fracture of the femoral neck and shaft. *J of Korean Society of Fractures*, 11-4: 739-744, 1998.
- 8) **Lee DC, Lee YS and Shin DS:** Ipsilateral femoral shaft and neck fracture. *J of Korean Society of Fractures*, 12-2: 246-252, 1999.
- 9) **Lee SH and Ha SH:** Ipsilateral Fracture of the Femoral Neck and Shaft. *The Journal of the Korean Orthopaedic surgery*, 28-2: 705-712, 1993.
- 10) **Mackenzie DB:** Simultaneous ipsilateral fractures of the femoral neck and shaft: Report of 8 case. *South Africa Med J*, 24: 459-467, 1971.
- 11) **Moon MS, Yhum CS and Park KS:** Fractures of the femoral shaft and associated ipsilateral fractures of the femoral neck. *The Journal of the Korean Orthopaedic Surgery*, 12-5: 155-160, 1977.
- 12) **Park MS and Kim GH:** Ipsilateral Femoral Neck and Shaft Fracture. *The Journal of the Korean Orthopaedic Surgery*, 26-5: 1434-1440, 1991.
- 13) **Schatzker J and Barrington T:** Fracture of femoral neck associated with fractures of the same femoral shaft. *Can J Surg*, 11: 297-305, 1986.
- 14) **Swiontowski MF, Hansen ST and Kellam J:** Ipsilateral fracture of the femoral neck an shaft. *J Bone Joint Surg*, 66-A: 260-268, 1984.
- 15) **Swionkowski MF:** Ipsilateral femoral shaft and hip fractures. *Orthop clin N Am*, 18: 73-84, 1984.
- 16) **Wiss DA, Sima W and Brien WW:** Ipsilateral fractures of the femoral neck and shaft. *J Orthop Trauma*, 6: 159-166, 1992.
- 17) **Wolinsky PR and Johnson KD:** Ipsilateral femoral neck and shaft fracture. *Clin Ortho*, 318: 81-90, 1995.

Abstract**Treatment of Ipsilateral Femur Neck & Shaft Fracture**

**Jin-Woo Kwon, M.D., Ki-Hwon Kim, M.D., Sang-Ho Moon, M.D., Kyu-Min Kong, M.D.,
Kyong-Tae Sohn, M.D., Sang-Hoon Lee, M.D., Tae-Woo Kwon, M.D.**

Department of Orthopedic Surgery, Sunlin Hospital, Pohang, Korea

Purpose: The purpose of this study was to analyse the result of operative treatment in ipsilateral femur neck and shaft fracture.

Materials and Methods: Eleven cases of ipsilateral femur neck and shaft fractures were operated and followed more than 1 year. There were 11 men and the mean age at index operation was 38 years (range 22~54). In neck fracture there were 3 of type I, 6 of type II, and 1 of type III according to Garden classification, shaft fractures were located at middle 1/3 (7 cases), at distal 1/3 (4 cases). We evaluate the operation time, union time, nonunion, malunion, and clinical evaluation with pain and joint stiffness.

Results: In neck fractures treatment methods were 8 of multiple pinning, 2 of reconstruction nail and 1 of CHS, in shaft fractures 2 of DCP, 7 of retrograde nailing (3 Ender nail, 4 interlocking nail). The mean operation time was 180 minutes in reconstruction nail, 220 minutes in multiple pinning and DCP and 200 minutes in multiple pinning and retrograde nailing. The mean time for shaft union was 5 months. The complications were 1 case of neck reduction loss during operation in reconstruction nailing group, 2 of aseptic necrosis of femur head, 2 of shaft nonunion in retrograde nailing group, 1 of persistent pain around knee in Ender nailing group.

Conclusion: The author think that reconstruction nail fixation is technically difficult, thus neck and shaft fracture be fixed individually. Neck fracture can be fixed first without difficulty and shaft fracture should be fixed rigidly due to comminution.

Key Words: Femur, Neck and shaft, Fracture

Address reprint requests to _____

Jin-Woo Kwon

69-7, Daesin-dong, Buk-gu, Pohang, 791-100, Korea

Department of Orthopaedic Surgery, Pohang Sunlin Hospital

Tel : 054-245-5161, Fax : 054-245-5311

E-mail : oskwon@hanmail.net