



11, 3, 1998 7

The Journal of the Korean Society of Fractures
Vol.11, No.3, July, 1998

가

= Abstract =

Treatment of Unstable Intertrochanteric Fractures of the Femur

- Comparative analysis of the postero-medial fixation with or without
additional screw -

Jin-Hong Ko, M.D., Bum-Gu Lee, M.D., Do-Hyun Moon, M.D., Young-Sung
Kim, M.D.

Department of Orthopedic Surgery, Gacheon Medical College, Gil Medical Center, Incheon, Korea

An unstable intertrochanteric fracture lacks continuity of the bone cortex on the opposing surfaces of the proximal and distal fragments. This cortical deficit is due to either comminution on the medial aspect of the neck (calcar region) or a large and separate posterior trochanteric fragment. Treatment of unstable intertrochanteric fracture have taken method to restore bony contact medially and posteriorly by anatomical reduction or displacement osteotomy.

The authors analyzed the 60 unstable intertrochanteric fractures treated by anatomic reduction and internal fixation with a compression hip screw from January 1990 to December 1995. We made a comparative analysis of the postero-medial fixation with additional screw (Group)

:

1198 (405-760)

가

Tel : 032) 460 - 3380 Fax : 032) 468 - 5437



and no fixation group(Group).

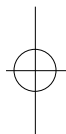
We tried to find the difference of operation time, blood loss, union time, weight bearing time, neck-shaft angle, sliding length of lag screw and complication rate in two groups.

The results were obtained as follows:

1. The mean union time was 11.5 weeks in the Group and 12.7 weeks in the Group ($p > 0.05$).
- 2 The mean weight bearing time was 6.1 weeks in the Group and 8.3 weeks in the Group ($p < 0.05$).
3. The decrease of neck-shaft angle was 2.3 degree in the Group and 5.2 degree in the Group ($p < 0.05$).
4. The sliding length of lag screw was 5.8mm in the group and 11.2mm in the group ($p < 0.05$).
5. The lower complication rate was obtained in the group than in the Group , but two groups showed no significance by statistical analysis.

In conclusion, the postero-medial fixation with additional screw in the treatment of unstable intertrochanteric fracture of the femur are suggested that medial cortical stability can be gained and early weight-bearing can be allowed.

Key Words : Femur, unstable intertrochanteric fracture, compression hip screw, transfixation screw.



compression hip screw

1990 1 1995 12

compression hip screw 97 1
 가 가 60 .
 26 가 14 ,
 가 12 , 65.7 ,



Table 1. Details of 60 patients treated for unstable intertrochanteric fracture of the femur

	Group (N = 26)	Group (N = 34)	P-value
Sex (M:F)	14 : 12	19 : 15	P > 0.05
Mean age (year)	65.7	69.8	P > 0.05
Cause of injury			
Slip down	16(61.6%)	22(64.7%)	P > 0.05
Fall down	4(15.4%)	8(23.5%)	
Traffic accident	6 (23%)	4(11.8%)	
Fracture pattern(Kyle)			P > 0.05
	22(84.6%)	30(88.2%)	
	4(15.4%)	4(11.8%)	
Degree of osteoporosis (Singh 's index)			P > 0.05
	2 (7.8%)	4(11.7%)	
	8(30.6%)	10(29.4%)	
	10(38.4%)	16(61.5%)	
	2 (7.8%)	2 (7.7%)	
	4(15.5%)	2 (7.7%)	

* Group : screw fixation group

Group : no screw fixation group

* Chi-square test, t-test and Wilcoxon rank-sum test

Table 2. Operative details of 60 patients for unstable intertrochanteric fracture of the femur

	Group (n=26)	Group (n=34)	P-value
Mean timing of operation days after fracture	6.9	5.4	p > 0.05
Mean duration of operation (minute)	147	105	0.0482
Mean blood loss (ml)	1020	915	p > 0.05
Mean TAD in mm	24.5	23.7	p > 0.05
Reduction of fracture			p > 0.05
anatomic reduction	24(92.3%)	29(85.2%)	
displaced reduction	2(7.7%)	5(14.8%)	

* Group : screw fixation group

Group : no screw fixation group

* T-test and Wilcoxon rank-sum test

(TAD : Tip-apex distance)

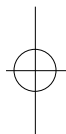


image intensifier 가

34 가 19 , 가
15 , 69.8 (Table 1).
가 16 (61.6%), 22 (64.7%)
가 (Table 1). Kyle17)

26 22 가 , 4 가 ,
34 30 가 , 4 가
(Table 1).

Singh 's index²⁰⁾

(p > 0.05) (Table 1).

가 2 17

6.9 5.4

(p > 0.05) (Table 2).

,
image intensifier 가
, drill bit
, screw transfixation
1
3-4
4 , 6
가
1/3
1.

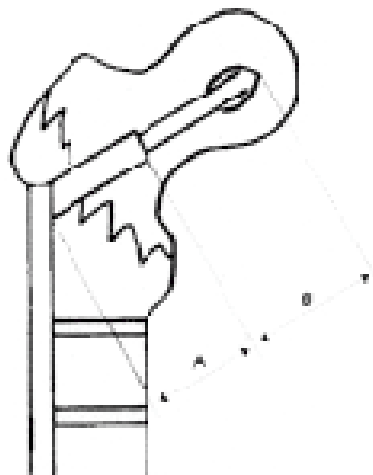


Fig 1. Measurement of lag screw by Doppelt,
 A. Barrel length of post-op
 B. Screw length post-op
 C. Barrel length of follow-up
 D. Screw length of follow-up
 Screw impaction length = barrel length
 $\ast(B'/A' - B/A)$

Table 3. Post operative details of 60 patients treated for unstable inter trochanteric fracture of the femur

	Group (n=26)	Group (n=34)	P-value
Mean time to weight bearing (week)	6.1	8.3	0.0453
Mean union time (week)	11.5	12.7	p > 0.05
Decrease of mean neck-shaft angle (degree)	4.3	7.5	0.037
Mean sliding length of lag screw (mm)	5.8	11.2	0.019

* Group : screw fixation group

Group : no screw fixation group

* T-test and Wilcoxon rank-sum test

Doppelt¹²⁾가

lag screw

15mm

. 60

compression hip screw

135 °

(Fig 1).

4. (Neck shaft angle)

4mm

가

26 24 (92.3%)

2 (7.7%)

34 29 (85.2%)

5

(P>0.05)(Table 2).

Doppelt¹²⁾

2. - (Tip-apex-distance: TAD)

TAD⁸⁾

lag screw

1.

millimeter

147

105

24.5mm,

23.7mm

(P>0.05)(Table 2).

(P<0.05),

(hemovac)

1020ml

(P>0.05)(Table 2).

3.

915ml



Fig 2-A. 60 year-old male. The x-ray showing Kyle type III intertrochanteric fracture.
 B. Immediate postoperative X-ray showing anatomic and stable fixation with transfixation screw.
 C. Post-op 3months. The X-ray showing 1.5mm sliding of lag screw and fracture union.



Fig 3-A. 67 year-old male. The X-ray showing kyle type III intertrochanteric fracture.
 B. Immediate post operative X-ray showing anatomic and stable fixation.
 C. Post-op 13months. The X-ray showing 11.6mm sliding of lag screw and fracture union.



492 • / 11 3

($P<0.05$)(Table 3).

2. lag screw

6.1 , 8.3
($p<0.05$) (Table 2). 138 (Fig 2-A,B). 3 가 1.5mm

3. Dopplet method 11.5 , 12.7 (Fig 2-C).
($P>0.05$) (Table 3).

4. 134.5 (Fig 3-A,B). 13 가 4
Dopplet method 135.8 ° 131.5 ° 11.6mm
(Fig 3-C). 135.6 ° 128.1 °

($P<0.05$)(Table 3).

6. 9 2 , 3
5. (Lagscrew) (Sliding) 1 , 1 ,
5.8mm, 11.2mm 2 가 (Table 4).

Table 4. Complications of unstable
intertrochanteric fracture

	Group (n = 26)	Group (n = 34)
Varus deformity(>10 °)	1	2
Superior penetration of lag screw		2
Infection	2	1
Shortening(>20mm)		1
Total	3(11.5%)	6(17.6%)

* Group : screw fixation group

Group : no screw fixation group

(reverse obliquity) 13)

9).

compression hip screw fixed

nail plate , Ender nail

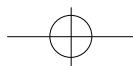
nail

가 가

7).

Apel 7)

57%



, compression hip screw

¹⁾ 7 , Leung ¹⁹⁾ 5.6 가

4.3 , 7.5

($P<0.05$).

가

¹⁾ 9mm, Leung ¹⁹⁾

, 5.61mm, Jacobs ¹⁵⁾ 15.7mm, Steinberg ²¹⁾ 9.3mm

^{10,14)}

15mm 가

²¹⁾

1977 Jones¹⁶⁾

transfixation

⁶⁾

11.2mm sliding

wring

가 ($P<0.05$).

Jacobs ¹⁵⁾ 6%, Wolfgang ²²⁾

lag screw effect

21%

26

34

6

1 , 2

1

가 Cleveland¹¹⁾

Kyle¹²⁾

⁸⁾가 32mm

($P>0.05$)

²⁾ 146 , 622ml, ⁴⁾ 94

, 622ml, ⁵⁾ 95 , 511ml, Leung ¹⁹⁾ 53.2 ,

1012ml

147 , 1020ml,

105 ,

가

915ml

($p<0.05$)

($p>0.05$),

가

¹⁾ 12 , ³⁾ 13.2 ,

⁴⁾ 15.1

11.5

12.7

가

($p>0.05$).

Larsson ¹⁸⁾

¹⁾ , , :

가

가

, 30:437-443,

REFERENCES



- 1995.
- 2) , , , :
 , 28:1666-1673,
 1993.
- 3) , , , , , :
 , 30:1814-1819, 1995.
- 4) , , :
 , 31:879-887, 1996.
- 5) , , , :
 , 30:939-943, 1995.
- 6) , , , :
 wiring compression hip screw
 ,
 4:125-135, 1992.
- 7) **Apel DM, Patwarhan A, Pinzyr MS and Dobozi WR** : Axial loading studies of unstable intertrochanteric fractures of the femur. *Clin Orthop*, 246:156-164, 1989.
- 8) **Baumgaertner MR, Curtin SL, Lindskog DM and Keggi JM** : The value of the tip apex distance in predicting failure of fixation of peritrochanteric fractures of the hip. *J Bone Joint Surg*, 77-A:1058-1064, 1995.
- 9) **Boyd HB and Anderson LD** : Management of unstable trochanteric fractures. *Surg Gynecol Obstet*, 112:633-638, 1961.
- 10) **Chang WS, Zuckermann JD, Kummer FJ and Frankel VH** : Biomechanical evaluation of anatomical reduction versus medial displacement osteotomy in unstable intertrochanteric fractures. *Clin Orthop*, 225:141-146, 1987.
- 11) **Cleveland M, Bosworth DM, Thompson FR, Wilson HJ Jr and Ishizuka T** : A ten-year analysis of intertrochanteric fractures of the femur. *J Bone Joint Surg*, 41-A:1399-1408, 1959.
- 12) **Dopplet SH** : The sliding compression screw; today 's best answer for stabilization of intertrochanteric hip fractures. *Orthop Clin North Am*, 11:507-523, 1980.
- 13) **Evans EM** : The treatment of trochanteric fractures of the femur. *J Bone Joint Surg*, 31-B:190-203, 1994.
- 14) **Friedle W, Schult W, Manner M, Ruf W und Mischkowsky T** : Belastbarkeit und Verformung instailer peritrochanterer osteotomien nach 145 degree-Winkelplattenosteosynthese und endernagelung. *Unfallchirurgie*, 13(1):1-7, 1987.
- 15) **Jacobs RR, McClain O, and Armstrong HJ.** : Internal fixation of intertrochanteric hip fractures. A

