

## Proximal Femoral Nail (PFN) for the Treatment of the Femoral Trochanteric Fracture

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**Purpose:** We report our experience of treatment of peritrochanteric fractures with newly designed proximal femoral nail.

**Materials and Methods:** We have studied 24 cases of the peritrochanteric fractures using PFN between Jun. 2001 and Aug. 2002 excluding 3 cases (1 case expired due to ARF and pulmonary complication, 2 cases were loss of follow-up). The mean age was 69.6 years and the mean duration of follow-up was 12 months.

**Results:** The mean medial cortical displacement of postoperative roentgenogram was 4.6mm, the mean anterior cortical displacement of postoperative roentgenogram was 4.1 mm, the mean degree of sliding of lag screw between postoperative and last follow-up roentgenogram was 1.2 mm. Neck-shaft angle was average 3.3° varus angulation (from postoperative average 131.1° to last follow-up average 127.8°). Allowed to begin weight-bearing at 1 week postoperatively, the mean union time was 10 weeks and all cases showed bony union and there were no evidence of delayed union or nonunion. Perioperative complications were pulmonary embolism, DVT, varus deformity, 2 thigh pains, and so on.

**Conclusion:** We obtained satisfactory results in treatment of the femoral trochanteric fractures using PFN in point of early ambulation, excellent union rate and minimal complication.

**Key Words:** Femur, Trochanteric fracture, Proximal femoral nail

4,7)

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(screw cut-out) 2 , 2 , 2 가 .

가 (anti-rotational hip 2 , 1 가

pin) , (nail) .

2) . 4.

24 Seinsheimer <sup>17)</sup> Evans <sup>6,10)</sup> .

가 Singh index<sup>5)</sup>

(Table 1).

5.

2001 6 2002 8

27 3 가 24 10° 15° , 10°

15° , 5~8 cm 5 cm 가 ,

long nail AO/ASIF system , 240 mm 10, 11, 12 mm

17 mm . 가 6° 가

가 6°

11 cm 11 mm .

(neck screw) 6.5 mm (anti-rotational screw) , 15 cm

(static or

dynamic locking) (nail tip) .

1. 가 1/2

24 , 가 10 , 가 14 ,

69.6 10 mm .

2. 10~15

15 가 , 5 , 가 4 mm .

(hole)

3. dynamization .

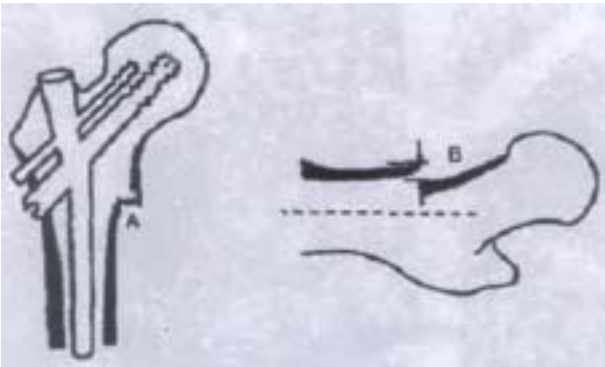
(71%) 7 , 4 ,

**Table 1.** Classification of fracture and degree of osteoporosis

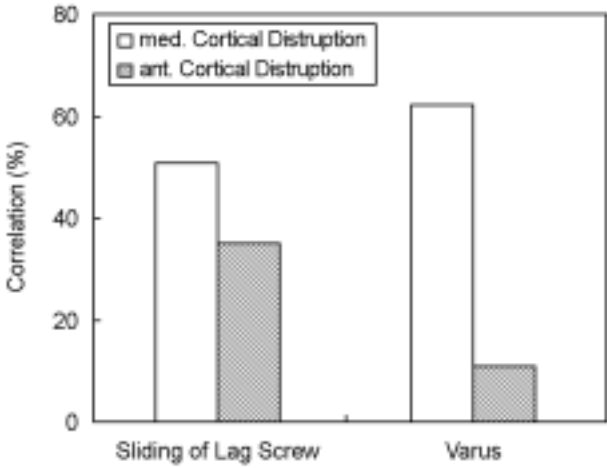
Fracture type \ Singh index	Grade I	Grade II	Grade III	Grade IV	Grade V	Grade VI	Total
Intertrochanteric Fx. Stable	1	1	3	2	0	0	7
Intertrochanteric Fx. Unstable	1	3	7	5	0	0	16 (67%)
Subtrochanteric Fx. type V	0	0	0	0	1	0	1
Total	2	4	10	7	1	0	24

6. , 0 pint  
2 pints .  
4.6 mm,  
4.1 mm ,  
1.2 mm,  
131.1° 127.8° 3.3°  
1 , 10 .  
2 ,  
1 , 1 , 1 ,  
1 , 2 가 .  
4 , 가 7 , 13  
(Table 2).

7. 1 , 80 ml



**Fig. 1A-B.** (A) indicates medial cortical disruption. (B) indicates anterior cortical disruption.



**Fig. 2.** Graph shows the correlation between medial. Cortical disruption, anterior. Cortical disruption and sliding of lag screw, varus change.

**Table 2.** The result of postoperative ambulation

Ambulation state/age	31~50	51~60	61~70	71~90	Total
Bedridden	0	0	1	3	4
Ambulation within house	0	0	2	5	7
Social activity	2	2	6	3	13 (54%)
Total	2	2	9	11	24

**Table 3.** The relationship between the degree of osteoporosis, fracture type and the degree of sliding of lag screw, neck-shaft angle

	Osteoporosis		Fracture type (intertrochanter)	
	Grade I, II, III	Grade IV, V, VI	Stable	Unstable
Sliding of lag screw	0.08 mm	1.5 mm	1 mm	1.3 mm
Neck-shaft angle	3.4°	3.1°	1.67°	4.89°

(p>0.05) (Table 3).

(p<0.05) 가 (Fig. 2). 5).

가 ,

가 가 가 가

14). Ender , 가

가

1931 Smith-Peterson triflanged nail

1941 Jewett nail-plate one piece device

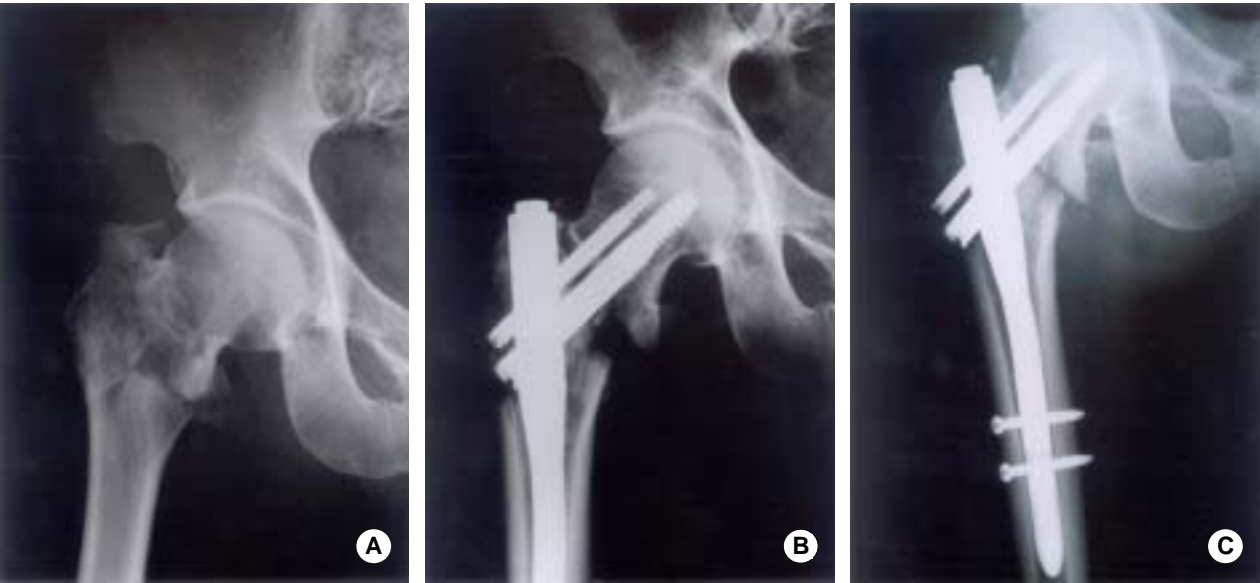
가 (collapse)

가 9). 1960

가

가 16).

11,12) (tension band) 가



**Fig. 3A-C.** (A) Right hip AP view shows unstable intertrochanteric fracture of 62 years old male patient. (B) Immediate postoperative radiograph shows slight valgus & posteromedial gap. (C) 10 weeks postoperative radiograph shows varus change with lag screw sliding and fracture site compression.



**Fig. 4A-D.** (A) Right hip AP view shows unstable intertrochanteric fracture of 70 years old female patient with unstable. (B) Post traction radiograph shows satisfactory reduction. (C) Immediate postoperative radiograph shows acceptable reduction and fixation. (D) 12 weeks postoperative radiograph shows that complete bony union was obtained.

3)

(load-bearing implant)

가

Rosenblum<sup>16)</sup>

, Mahomed<sup>15)</sup>

30%

가

13%

Al-yassari<sup>1)</sup>

1.4%, 3

4%, 27%

7.1%,

21%,

Banan<sup>2)</sup>

3%

8~15%

가

1

1.35%

Laros Moore<sup>13)</sup>

17)

Halder<sup>8)</sup>

(stress shielding phenomenon)

가

(

11 cm)

(antirotation 6.5 mm

(fluting)

neck screw)

(p<0.05), 10°

2

