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, 가

: 1995 1 1999 8

가 가  
(63 )

30 ,

1 35 65

가

:

14.6 ,

16.2

1

, 1 , 1 , 1 가

2 ,

2 ,

1 가

. Magerl<sup>16)</sup>

가

25 ,

3 ,

2

29

, 4 , 2

83.3%, 82.9%

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1.6

가

, ,

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가

가

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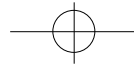
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2,25). , , 3.

, , 1/3 10 , 1/3

41 , 1/3 14 1/3

. 가 , 6 .

8 , 7 , 2 ,

가 48 가 . Winqvist-Hansen<sup>24)</sup>

65 1 17

, 2 33 , 3 11 , 4 2

, 2 2 가 .

9). 1995 1 1999 8

4.

65 (63 ) 38

1 가가 65 (63 )

, , (

) 8 가 7 ,

7 , 6 , 4 ,

3 , 2 , 1

(Table 1).

5.

2

가 42 (64.6%) 가 2 4

가 21 (32.3%), 4

2 (3.1%) . 3

2 , 2 , 2 ,

1 7 가

5 가

2 가

가 47 (72.3%)

, 9 (13.8%), 5

(7.7%), 4 (6.2%) .

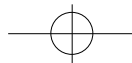
(Table 2).

**Table 1.** Associated injury.

Associated injury	No. of cases
Tibiofibular fracture including ankle	8
Pelvic bone fracture	7
Forearm bone fracture	7
Rib fracture	6
Thorax and abdomen injury	4
Ligament injury of knee	3
Head injury	2
Spine fracture	1
Total	38

**Table 2.** Operation period after injury.

	Plate	Nail	Total
-1 week	10	5	15
1-2 weeks	11	16	27
2-3 weeks	4	12	16
3-4 weeks	3	2	5
4 weeks -	2	0	2
Total	30	35	65



6. 가 가

Winqvist-Hansen 1, 2 50 13 4

31 , 3 3 , 1 35 .

2

가 .

Winqvist-Hansen 1, 2, 3

27 , 4 2 , 1 30 1.

5 가 가

8 가

(Table 3). 가 가

7. 14.6 16.2

1) , Winqvist-Hansen

1 13.8 , 2 15.2 , 3 19.2 ,

4 21 , 23 3, 4

2

4 .

4 , 1/3 10 14.9 , 1/3 41 15.5

7 , 1/3 14 15.7

2) (Table 4).

17 2.

9 .

1 , 1 ,

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20

가

1 6

13

가

(Fig 1A-D).

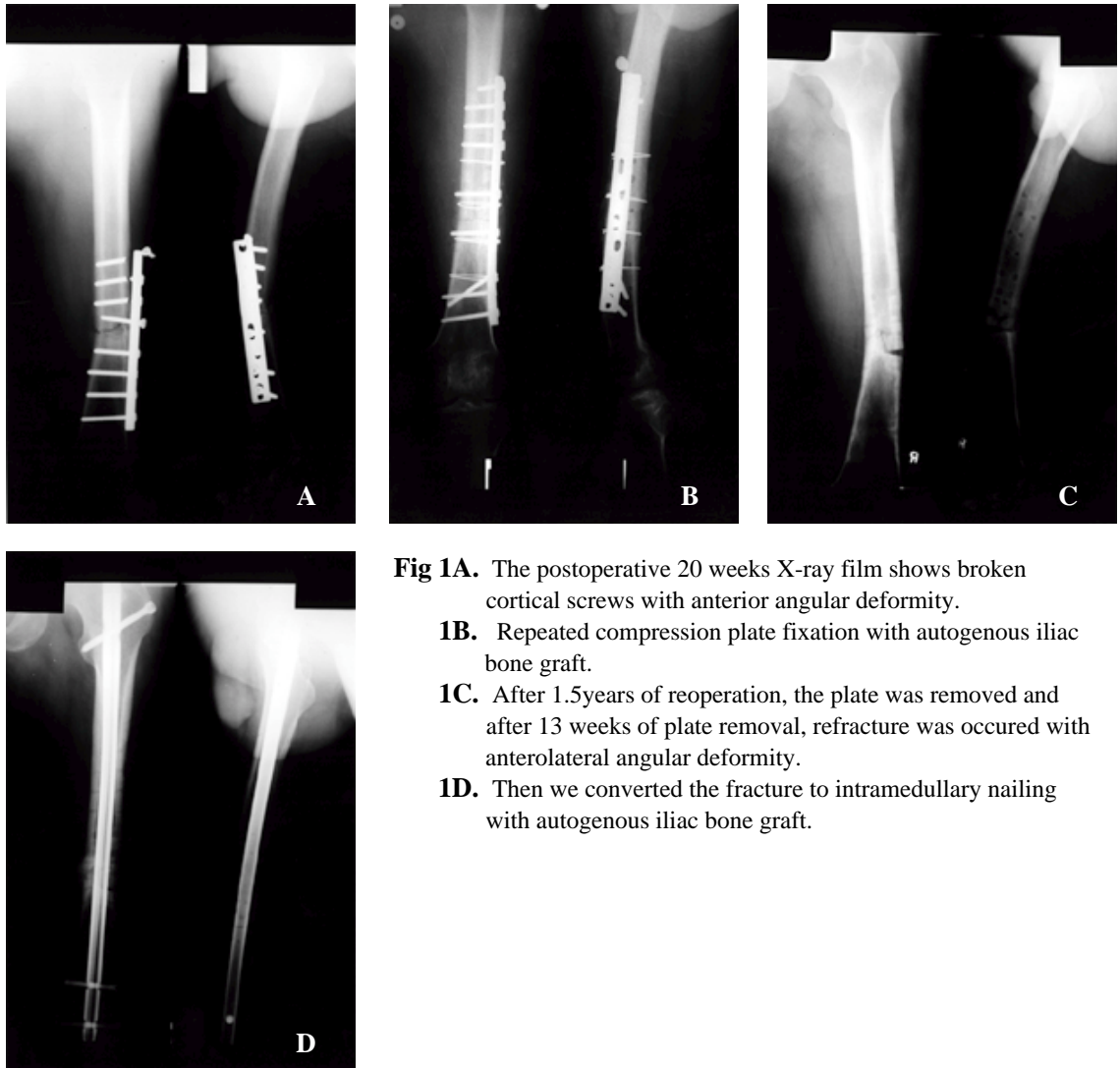
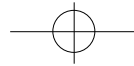
1 , 가 .

**Table 3.** Winqvist-Hansen<sup>24)</sup> classification of femoral shaft fracture.

Type	Plate	Nail	Total
Type I	7	10	17
Type II	12	21	33
Type III	8	3	11
Type IV	2	0	2
Segmental fracture	1	1	2
Total	30	35	65

**Table 4.** Duration of bone union by location of fracture site.

	Plate(weeks) / No. of cases	Nail(weeks) / No. of cases	Total(weeks) / No. of cases
Proximal 1/3	13.9 / 7	17.1 / 3	14.9 / 10
Middle 1/3	14.3 / 14	16.1 / 27	15.5 / 41
Distal 1/3	15.6 / 9	15.9 / 5	15.7 / 14
Total	14.6 / 30	16.2 / 35	15.5 / 65



**Fig 1A.** The postoperative 20 weeks X-ray film shows broken cortical screws with anterior angular deformity.

**1B.** Repeated compression plate fixation with autogenous iliac bone graft.

**1C.** After 1.5 years of reoperation, the plate was removed and after 13 weeks of plate removal, refracture was occurred with anterolateral angular deformity.

**1D.** Then we converted the fracture to intramedullary nailing with autogenous iliac bone graft.

2 3 가  
가 Magerl <sup>16)</sup> 가  
25 (83.3%), 3  
(10%), 2 (6.7%), 29  
(82.9%), 4 (11.4%), 2 (5.7%) (Table 5).

(Fig.2A-D).

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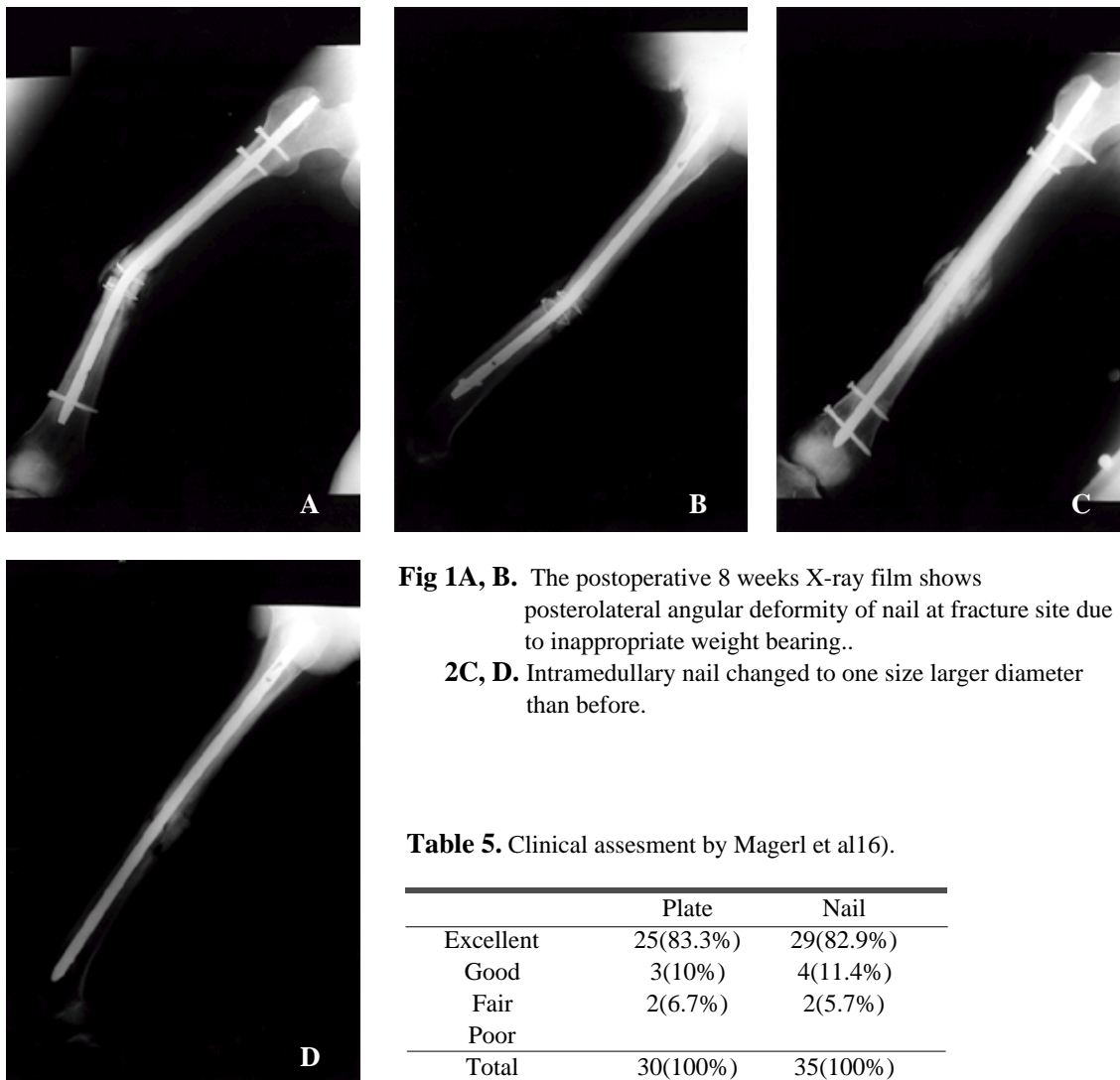
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Winquist-Hansen 3, 4

1

가

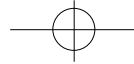




**Table 5.** Clinical assesment by Magerl et al(16).

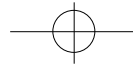
	Plate	Nail
Excellent	25(83.3%)	29(82.9%)
Good	3(10%)	4(11.4%)
Fair	2(6.7%)	2(5.7%)
Poor		
Total	30(100%)	35(100%)

(fracture      Laurence<sup>15)</sup>  
 disease)      18).  
 가      가  
 가      가  
 1907      Lane  
 AO      가  
 가      17,20),  
 가      Küntsch<sup>14)</sup>  
 8). Olerud      Karlström<sup>19)</sup>      6,23).



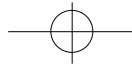
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가 (10mm)  
 9), 가  
 21). 가  
 가 ,  
 4,26,27).  
 Winqvist-Hansen<sup>24)</sup> 3, 4 가 가  
 가 82.9%, 83.3%  
 3,10). Küntscher<sup>13)</sup>  
 (interlocking)  
 , Bucholz<sup>1)</sup>  
 가가 .  
 가가  
 5).  
 1/3 가  
 7,11,12). Winqvist-Hansen<sup>24)</sup> 3  
 3 , 1  
 1 가가 65 ( 35 )  
 30 ,  
 Winqvist-Hansen<sup>24)</sup> 4  
 . Magerl<sup>16)</sup> 가 14.6 , 16.2  
 82.9%, 83.3% Winqvist-Hansen 1 13.8 , 2  
 15.2 , 3 19.2 , 4 21 , 23  
 3, 4  
 1 , 1 , 1 가  
 2 , 1 가 . Soto-Hall  
 Maclog<sup>22)</sup>  
 2 , 2 , 1 가  
 3, Magerl<sup>16)</sup> 가  
 10mm 가 25 (83.3%), 3 (10%), 2  
 (6.7%) , 29 (82.9%),  
 4 (11.4%), 2 (5.7%)  
 , 가  
 1).  
 1 가  
 가



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#### Abstract

## THE RESULTS OF FEMORAL SHAFT FRACTURE BY DIFFERENCE OF OPERATIVE METHOD

**Ki-Do Hong, M.D., Sung-Sik Ha, M.D., Jae-Cheon Shim, M.D.**

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**Purpose** : To evaluate and compare the bone union period, complications and functional assessments between compression plate and intramedullary nailing which are operative methods of the femoral shaft fracture.

**Material and Method** : We evaluate the bone union period, complications and functional assessments of the 65 cases(63 patients). 30 cases were treated with compression plate and another 35 cases were treated with intramedullary nailing, who were diagnosed to have femoral shaft fracture. And they were treated in our hospital from January 1995 to August 1999, whose follow up was available more than 1 year.

**Result** : Mean bone union period of compression plate fixations was 14.6 weeks and intramedullary nailing was 16.2 weeks. Complications in compression plate fixations group was deep infection in one case, metal failure in one case, refracture in one case, nonunion in one case, and there were 5 complications in intramedullary nailing fixations group which were nonunion in 2 cases, limb shortening in 2 cases and angular deformity of nail in one case. By using functional assessment according to Magerl et al<sup>16)</sup> among 30 cases of compression plate fixations, 25 were excellent, 3 were good, 2 were fair, and among 35 cases of intramedullary nailing, 29 were excellent, 4 were good, 2 were fair, so we achieved excellent results in both techniques as 83.3% and 82.9% cases each.

**Conclusion** : In operative management of femoral shaft fracture, compression plate fixations and intramedullary nailing shows average difference of 1.6weeks of bone union period, but both method didn't show significant difference in bone union period. Both methods achieved excellent results in functional assessments, so if we manage by knowing thoroughly the advantage and disadvantage of both technique, we can get a excellent results with reduced complications.

**Key words** : Femur, Shaft fracture, Compression plate, IM nailing

