

(PFN)

· · · · ·

가

< >

: (PFN)

: 2000 6 2001 5
26

가

가

: 72 , 0.54unit 26 24 4
2 가 6

4.4mm

1.4

가

3

10mm

72.2

2 hip pin

가

가

cut-out

:

4 (705-718),

가

TEL : 053-650-4277

FAX : 053-650-4272

E-mail : dkshin@cuth.cataegu.ac.kr

*

2001

	(Proximal Femoral Nail, PFN)(Synthes, Paoli, Switzerland)	index	3.7	가 Singh's
small PFN		가	5cm	가
		가		가 .4
Simmermacher ¹⁵⁾	PFN			
PFN	가			
2000 6 1	60	hand reamer		flexible
PFN				
2001 5 1	1	. hip pin		가
29 2 1	26	hip pin		hip pin
가 2 26	가 9 17			
73 .	60 92			
가	20			
2 .	4			
16 A2 7 A3 3	AO-Muller ¹⁰⁾ A1			
Evans(by Jensen) ⁷⁾ I 3 , II 11 , III	modified	가	3	
4 , IV 8 , V 0				
14 12 .		20 1		
26 19 (73%) 가	가	가	4	1
7		가	2	3

가 가 PFN , cut-out, , , .

6 , 3 , 24 72 (45-150) 0.54 ± 1.07unit . 15
가 . 11
. 24 92%

24 4 2 가 6
가 . 2

가 가 1 1
4 가
, , 6 가 4.4mm(0-17mm) . 3
10mm

3.14 ± 3.21mm,
5.91 ± 5.49mm
(p=0.203).
가 72.2
84.2
39.4
(p=0.000), (p=0.818), (p=0.219)
가 . 1.4

14) 가 가 Shin
Skovoron¹⁶⁾ 가 (p=0.000), (p=0.818), (p=0.219)
가 . 1.4
2 가 4 가
가 1.0
9 가 2.6
가 (p=0.006).
(p=0.744), (p=0.067)

Mann-Whitney test, Kruskal-
Wallis test p 0.05

가 PFN hip pin . 1 가
가 , hip pin 75mm가 60mm 가
hip pin 6.5mm

13mm . 가 PFN 가 .

가 ,

가 . 10mm ,

3 6 가

hip pin 2 small

PFN

가

가 PFN .

cutting out PFN

92% 4 2

가 6

가 3,8,11)

PFN

가 .

가

3,9,14). 1980 . Park Kim¹¹⁾, Bridle 가 2), Bess Jolly¹⁾

가 , Kwun⁸⁾, park¹²⁾

가 ,

가 72

가 3,5,11)

가 13 83.5 ± 23 , 13 93.5 ± 33 (p=0.363).

가 3,8,9,14)

가 ,

cut-out 1,2,8,11,13,14) PFN

0.54 ± 1.07uint 26 20

가

가 4 2

2uint 2 PFN
Park Kim¹¹⁾
0.8unit 6
Han Yu⁵⁾ hip pin
0.7unit PFN 2
가 hip pin
PFN 가
가 6.5mm
가 11mm
PFN 가
가 PFN hip pin
PFN (safty stop)가
가
4.4mm
10mm 가 3
10mm 가
4,17) cutting out
Park Kim¹¹⁾ 1,2,8,11,13,14)
3,6)
PFN
PFN
3 12mm, 13mm, 17mm
(buttress)
가 가 가
(barrell)
가

26

PFN

PFN

가

REFERENCES

- 1) **Bess RJ and Jolly SA** : Comparison of compression hip screw and gamma nail for treatment of peritrochanteric fractures. J South Orthop Assoc, 6:173-9, 1997.
- 2) **Bridle SH, Patel AD, Bircher M and Calvert PT** : Fixation of intertrochanteric fractures of the femur. A randomised prospective comparison of the gamma nail and the dynamic hip Screw. J Bone Joint Surg, 73(B):330-334, 1991.
- 3) **Chevalley F and Gamba D** : Gamma nailing of peritrochanteric and subtrochanteric fractures: clinical results of a series of 63 consecutive cases. J Orthop Trauma, 11:412-5, 1997.
- 4) **Gundle R, Gargan MF and Simpson AH** : How to minimize failures of fixation of unstable intertrochanteric fractures. Injury, 26:611-614, 1995.
- 5) **Han HJ and Yu HJ** : The Gamma nail for unstable peritrochanteric fractures. J korean society of fracture, 9:76-80, 1996.
- 6) **Hardy DC, Descamps PY, Krallis P et al.** : Use of an intramedullary hip-screw compared with a compression hip-screw with a plate for intertrochanteric femoral fractures. A prospective, randomized study of one hundred patients. J Bone Joint Surg, 80(A):618-30, 1998.
- 7) **Jensen JS** : Classification of trochanteric fractures. Acta Orthop Scand 51:803-810, 1980.
- 8) **Kwun KW, Kim SK, Lee SW and Youn KH** : Treatment of intertrochanteric fractures of the femur - Comparison of the Gamma nail and the dynamic hip screw. J Korean Orthop Assoc, 28:1666-1673, 1993.
- 9) **Leung KS, Chen CM, So WS et al.** : Multicenter trial of modified Gamma nail in East asia. Clin Orthop, 323:146-54, 1996.
- 10) **Muller ME, Nazarian S, Koch P and Schatzker J** : The comprehensive classification of fractures of long bones. Berlin, Springer-verlag, 1990.
- 11) **Park MS and Kim KN** : Intertrochanteric fractures of the femur treated with sliding hip compression screw and Gamma nail-Mechanical failure after internal fixation. J korean hip society, 12:102-110, 2000.
- 12) **Park SR, Kang JS, Kim HS, Lee WH and Kim YH** : Treatment of intertrochanteric fracture with the Gamma AP locking nail or by a compression hip screw-a randomised prospective trial. Int Orthop, 22:157-60, 1998.
- 13) **Radford PJ, Needoff M and Webb JK** : A prospective randomised comparison of the dynamic hip screw and the gamma locking nail. J Bone Joint Surg, 75(B):789-93, 1993.
- 14) **Shin DK, Kwun KW, Kim SK, Lee SW, Choi CH and Go SB** : Ambulatory recovery after fixation of intertrochanteric fracture with Gamma nail in the elderly. J Korean Society of Fracture, 14:771-778, 2000.
- 15) **Simmermacher RK, Bosch AM and Van der Werken** : The AO/ASIF - proximal femoral nail(PFN): a new device for the treatment of unstable proximal femoral fractures. Injury 30:327-332, 1999.
- 16) **Skovron ML, Koval KJ, Aharonoff GB and Zuckermann JD** : Outcome assessment after fracture in the elderly. ICL, 46:439-443, 1997.
- 17) **Watson JT, Moed BR, Cramer KE and Karges DE** : Comparison of the compression hip screw with the Medoff sliding plate for intertrochanteric fractures. Clin Orthop, 348:79-86, 1998.

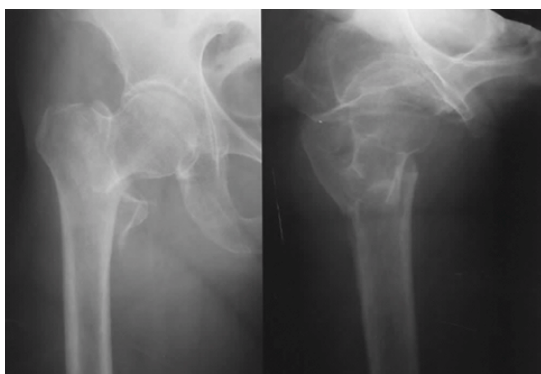


Fig 1-A : A 74-year-old woman with AO-Muller type A2.1 and Evans-Jensen type IV intertrochanteric fracture. Initial AP and cross-table lateral radiograph shows typical varus displaced fracture pattern and lesser trochanteric fragment.

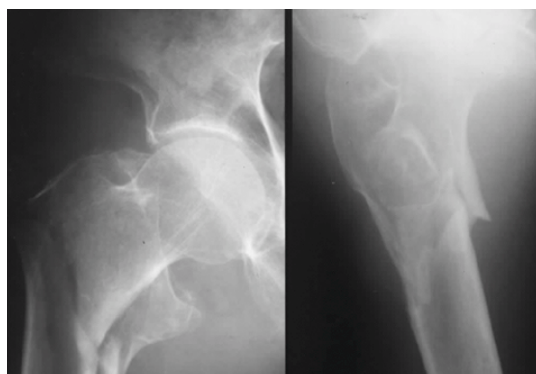


Fig 2-A : A 80-year-old woman with AO-Muller type A2.1 and Evans-Jensen type IV intertrochanteric fracture. Initial AP and cross-table lateral film shows large comminuted lesser trochanteric fragments and long fracture line extended far below lesser trochanter.

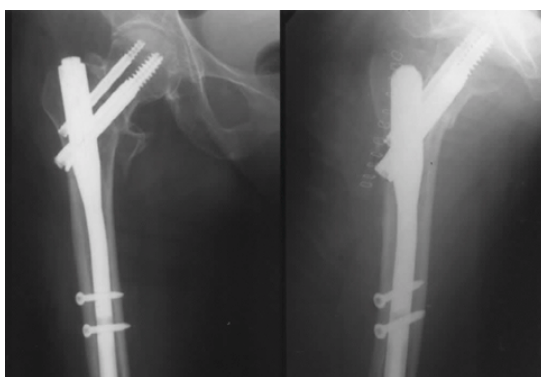


Fig 1-B : On immediate postoperative film, fracture was stably reduced and properly fixed with a PFN. Clinically she could walk well with one crutch on postoperative 5 days.

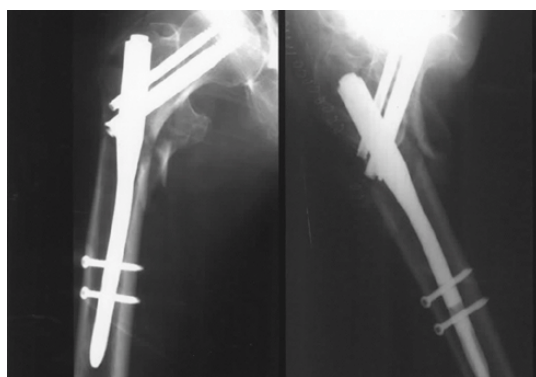


Fig 2-B : Immediate postoperative AP film shows significant medial cortical defect on the fracture site and lateral film shows poor apposition of anterior cortex.

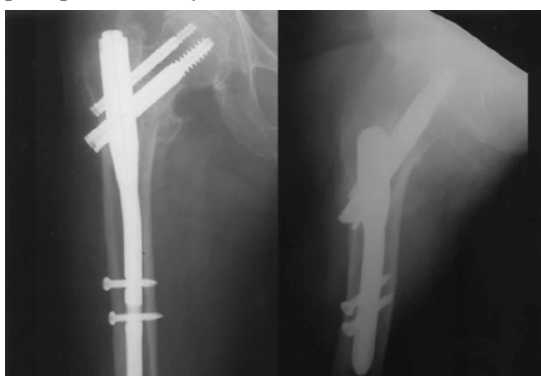


Fig 1-C : Postoperative 5 months film shows union of fracture without significant collapse of fracture site. Clinically she gained preoperative level of ambulation without any walking aid and good functional recovery score.



Fig 2-C : Postoperative 6 months film shows complete fracture union without significant collapse and clinically she could walk with cane and showed good functional recovery.

Abstract

Proximal Femoral Nail(PFN) for Femur Intertrochanteric Fracture

Dong-Kyu Shin, M.D., Koing-Woo Kwun, M.D.,
Shin-Kun Kim, M.D., Sang-Wook Lee, M.D.,
Chang-Hyuk Choi, M.D., Kyung-Min Kim, M.D.

*Department of Orthopedic Surgery, School of Medicine
Catholic University of Taegu, Taegu, Korea*

Purpose : This prospective study was performed to evaluate the usefulness and the risk of the Proximal Femoral Nail(PFN) for internal fixation of the femur intertrochanteric fracture.

Material and Method : We operated 26 consecutive intertrochanteric fracture patients with PFN from June 2000 to May 2001 and analysed the operation time, bleeding loss, union rate, union time, failure of fixation and complications. We also evaluated the clinical result with the recovery of ambulatory function and functional recovery score.

Result : Mean operation time was 72 minutes and mean transfusion amount was 0.54 unit. 24 cases progressed to union until 4 months uneventfully and remaining 2 cases also progressed to union within 6months without further operation. There was no failure of fixation. Mean fracture site impaction was 4.4mm and among the 11 unstably reduced cases 3 showed overimpaction(> 10mm). Clinically mean loss of ambulation ability was 1.4 grade. Last follow Skovoron functional recovery score was 72.2. We removed laterally protruded hip pin and femur neck screws in two cases because of irritation on the lateral trochanteric area skin. But there was no significant complications such as intraoperative or postoperative fractures and femoral head cut out.

Conclusion : The findings from this study indicate that, compared with other methods, PFN is useful and reliable choice for the femur intertrochanteric fracture treatment in the terms of less complications and equal or better results.

Key word : femur, intertrochanteric fracture, Proximal Femoral Nail

Address reprint requests to _____

Dep.of orthopaedic surg., Catholic University Hospital of Taegu,
Daemyung 4-dong, Namgu, Taegu, Korea
TEL : 053-650-4277
FAX : 053-650-4272
E-mail : dkshin@cuth.cataegu.ac.kr