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= Abstract =

## The Problems of Locked Intramedullary Nailing in the Proximal Shaft Fractures of the Tibia

Jin-Woo Kwon, M.D., Kyoung-Tae Sohn, M.D.,  
Seung-Ho Shin, M.D., Jae-II Kim, M.D.\*

*Department of Orthopedic Surgery, Pohang Sunrin Hospital, PoHang, Korea*

Proximal shaft fractures of the tibia have a high incidence of complication and often result in poor outcomes. Plate fixation and locked intramedullary nailing are the most common methods of treatment, but now the latter is more popular because of soft tissue problem, osteomyelitis etc..

The purpose of this study is to evaluate the results of locked intramedullary nailing in the treatment of proximal shaft fractures of the tibia and to draw a conclusion that what type of fracture patterns are the appropriate indication of nailing. We analyzed 18 proximal shaft fractures of the tibia which were treated by locked intramedullary nailing from October 1991 to March 1997 and followed more than 12 months. The results were as follows ;

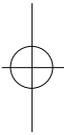
The complications were occurred in 12 cases(66.6%); 4 cases of delayed or non-union, 8 of angular deformity, 1 of leg length discrepancy. Delayed or non-unions were caused by fracture site comminution and bone defect. 5 anterior angular deformities were due to the pulling of the knee extensor mechanism and 3 valgus deformities were due to medially located entry portal.

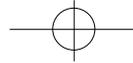
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Tel : (0562) 245 - 5162 Fax : (0562) 245 - 5311

\* 1998





In conclusion, since locked intramedullary nailing in proximal tibial fractures causes a high incidence of complications, it is recommended in transverse or undisplaced fractures. And plate fixation and bone graft will be recommended in comminuted or displaced oblique fractures, if soft tissue condition is permitted.

**Key Words :** Tibia, Proximal shaft fracture, IM nailing, Complications

48.1 , 30 가 6 (33.3%) 가 ,  
 가 14 (77.8%) 가 4 (22.2%) 가 3.5  
 (Table 1).  
 가 12 (66.6%) 가 , 3  
 (16.6%), 2 (11.1%), 가 1  
 (5.5%) .  
 , 6 (33.3%),  
 5 (28%) , , ,  
 , , , ,  
 , , , ,  
 가 11 , 7 .  
 Gustilo Anderson8) 1 2 ,  
 2 4 , 3-a 1 (Table 2).  
 1991 10 1997 3 38 1 2.  
 가가 18 ,  
 , .  
 3 8 ( 5 ) ,

**Table 1.** Age and Sex Distribution

Age	Male	Female	Total
21-30	1	1	2
31-40	6	0	6
41-50	4	0	4
51-60	0	0	0
61-70	2	2	4
71-80	1	1	2
Total	14	4	18

1.  
 1991 10 1997 10  
 38 1 가가 18  
 ,  
 22 79 ,



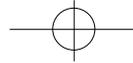


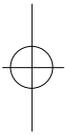
Table 2. Complications classified by fracture pattern

	Number of Patient	Nonunion or delayed union	Anterior angulation	Valgus deformity
Transverse Fracture	3	0	0	0
Oblique Fracture	4	0	2	2
Comminuted Fracture	11	4	3	1
Total	18	4	5	3

Table 3. Complications according to technical problems

Technical problem	Number of patients
Medialization of EP	5 (valgus 3, nonunion 2)
Severe knee flexion during nail insertion	4 (all cases ant. angulation)
Inadequate fracture reduction	2 (all cases delayed union)
Too low location of EP	1 (ant. angulation)
Total	12

\*EP: entry portal



ESR 가 가 WBC, 18 14 , 4

Russel-Taylor , ,

Brooker-Wills , ST-Pro , Ace 6

45 , ,

90 5cm가 .

가 ,

가 18 12 (66.6%)

가 3 4 2

가 가 가 11 4 , 3

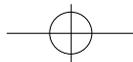
, 1 (Table 2). Freedman

Johnson<sup>7)</sup> 5 .

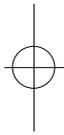
가5 ,

가4 ,





가2 , 가 (Fig 1-A)  
 가1 (Table 3),  
 가  
 2 가 3  
 , 2 90 가 10 4  
 , 6 , 8  
 5 5 , 10  
 1 가  
 , 4 . (Fig 1-B).  
 2.  
 3 70  
 가  
 (Fig 2-A).

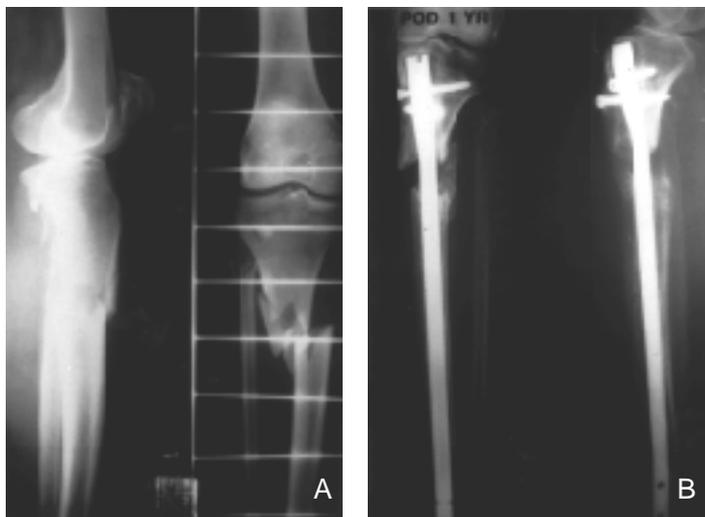
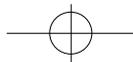


5  
 가  
 1.  
 47  
 4

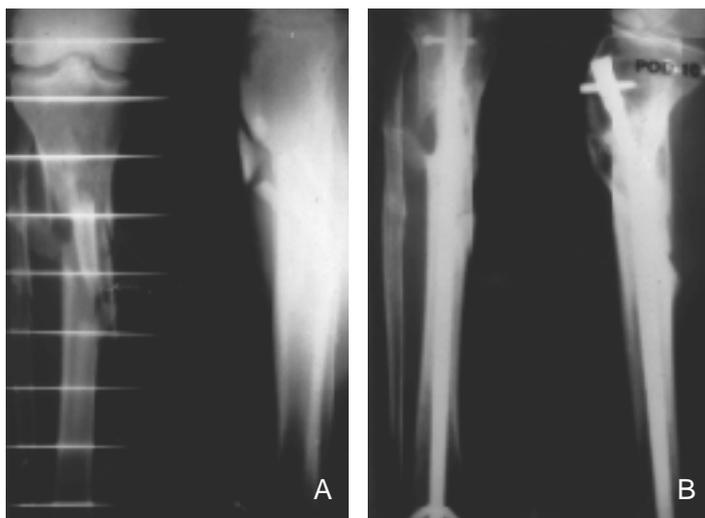


**Fig 1-A.** Preoperative radiographs of a 47 year-old male showed a long oblique fracture of the proximal tibia with butterfly fragment.  
**B.** Postoperative 10 months 3 weeks radiographs showed that the fracture was united with 10 degrees anterior angulation.





**Fig 2-A.** Preoperative radiographs of a 70 year-old female showed a comminuted fracture of the proximal tibia.  
**B.** Postoperative 12 months radiographs showed that fracture site was not united due to anterior angulation and severe valgus deformity. The valgus deformity(12 degrees) was caused by medially located entry portal.



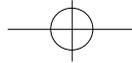
**Fig 3-A.** Preoperative radiographs of a 65 year-male showed a comminuted fracture of the proximal tibia.  
**B.** Postoperative 10 months radiographs showed that the fracture was completely united with 25 degrees anterior angulation.



2  
1  
(Fig 2-B).  
3.  
65

(Fig. 3-A),  
6 Brooker-Wills  
가  
10  
25  
(Fig 3-B).





8 , 2 , 2

Lang <sup>11)</sup>

가 Albert <sup>5)</sup> 6.3%, <sup>3)</sup> 14.5%, <sup>2)</sup> 19.5%,  
<sup>4)</sup> 16.5%

가

Schlak<sup>10)</sup>

. Schazker

Tometta<sup>13)</sup>

가

2가

1989 Henley<sup>9)</sup>

가

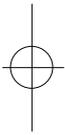
<sup>3)</sup>

가

Mckibbin<sup>12)</sup>, Schazker Schlak<sup>10)</sup>

가

가



가

가

가

가

<sup>9,13)</sup>

Cole<sup>6)</sup>, Tometta Collins<sup>13)</sup>

20

가가

1995 Lang <sup>11)</sup>

, Cole<sup>6)</sup> 57  
, Tometta

84%,

5%  
Collins<sup>13)</sup> 25

25%

, 1995 Freedman

Johnson<sup>7)</sup> 58%

가

2

5

<sup>1)</sup> 7 4

. Freedman Johnson<sup>7)</sup>

<sup>3)</sup>

33.3%

가

18



