



11, 4, 1998 10

The Journal of the Korean Society of Fractures
Vol.11, No.4, October, 1998

= Abstract =

Treatment of Ipsilateral Femur and Tibia Fractures

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Ipsilateral femur and tibia fractures - so called "floating knee" are caused by high energy trauma and frequently associated with many problems such as hemorrhagic shock, higher morbidity, delayed union, knee stiffness, etc. To get a satisfactory functional result, rigid internal fixation and early mobilization are regarded as treatment principles at present. Authors analyzed the functional outcomes of floating knee injuries according to the fracture type and methods of surgical treatments.

Twenty-eight patients were diagnosed as ipsilateral femur and tibia shaft fractures and treated surgically at the Dongguk University Hospital between June 1990 and May 1996. Average age was 34.5 years, and males were predominant. Majority of cases (27 out of 28) were caused by traffic accident. According to the classification of Blake and McBryde, type I injuries were observed in 17 cases and type II in 11 cases. Average follow up period was 1.3 years. All patients were treated by surgical methods which were selected appropriately with consideration of fracture types.

14 of 17 type I injuries were treated with intramedullary nailing for both femur and tibia fractures. Among these cases, 9 were excellent and 4 were good results. But in type II injuries, only 3 of 4 cases which were fixed with intramedullary nailing for femur and plate for tibia

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1997 41



fractures were good results.

Conclusively, Intramedullary nailing is an excellent method for ipsilateral femur and tibia fracture and type II injuries which have intra-articular fracture lines meet with worse results than type I.

Key Words : Ipsilateral Femur and Tibia, Fracture, Intramedullary nailing

가 1/3 가 18 (64%) 가 ,
4 , 3 ,
“ floating knee ” 1 (Table 1). Winquist-Hansen
가 19) 2 13 가
1 2 , 3 4 , 4 1 .
가 21 (75%) , 1/3 가 8
(29%) 가 ,
가 7
(25%) (Table 2). 4
(14%) Gustilo-Anderson¹³⁾ 1 2 , 2 3a
1 17 (61%) 1
1 5 , 2 8 3a 3b 2
가가 28 . 1975
Blake McBryde¹⁰⁾
1 “ true floating knee ”
17 (61%) 2
“ variant floating knee ” 11 (39%) ,
3
7
1 가 .
1.
4.
19 72 34.5 19 (68%) 6 ,
22 (79%) . 13 , 7 (25%)
2 , 4 , 1 , 7 (25%),
2. 3 (11%),
가 27 가 15 3 .
(54%) 가 , 1
5.
1
3.
가 20 (71%) ,



756 • / 11 4

Table 1. Fracture Site of Femur

| Fracture site | Femur |
|---------------------------------|-------|
| Proximal 1/3 | 2 |
| Middle 1/3 | 18 |
| Distal 1/3 | (-) |
| Segmental | 3 |
| Supracondylar | 4 |
| Supracondylar and intercondylar | 1 |
| Total | 28 |

Table 2. Fracture Site of Tibia

| Fracture site | Tibia |
|--|-------|
| Proximal 1/3 | 4 |
| Middle 1/3 | 6 |
| Distal 1/3 | 8 |
| Segmental | 3 |
| Proximal fracture with joint extension | 7 |
| Total | 28 |

Table 3. Method of Operative Treatment

| Method(Femur/Tibia) | No, of Cases |
|---------------------|--------------|
| Type I IM + IM | 14 |
| IM + EF | 3 |
| Type II IM + P | 4 |
| P + IM | 3 |
| P + P | 2 |
| P + EF | 1 |
| EF + EF | 1 |
| Total | 28 |

* IM : Intramedullary nailing

P : Plate and screw

EF : External fixation

IIIb

3

. 2

(Table 3). 1

가

2 2

4 13 (7.5)

12 8

6.

SPSS/PC+

t-

1.

가

가 가

8 51

(28)

50.4 (34)

6 8 가

가

(p<0.05).

2.

1

125 , 2

15.2 , 98.5 2

가

(p<0.05).

3. 가

Karlström Olerud¹⁶⁾ 가 1

9

(Fig 1).

5 , 2 , 1 ,

2

2

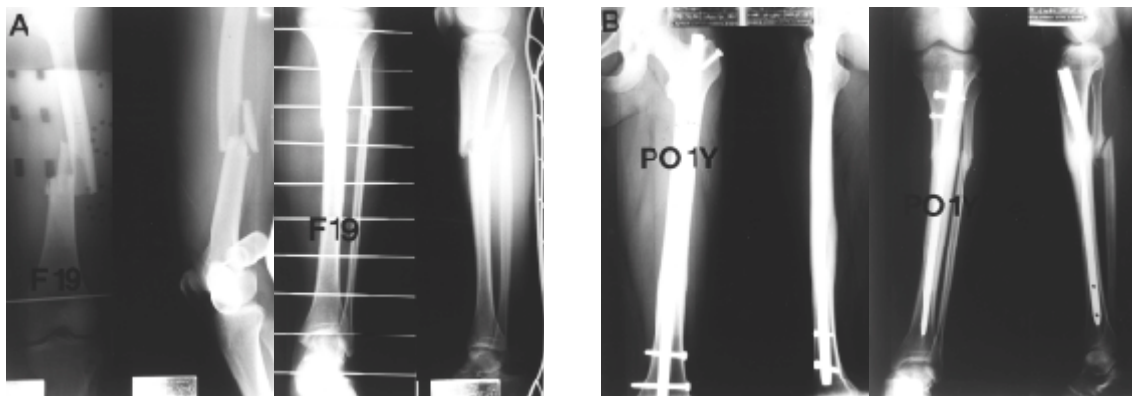


Fig 1-A. Preoperative radiographs of 19-year-old woman show comminuted femoral midshaft fracture and proximal one-third tibial fracture.
B. Postoperative 1 year radiographs show complete solid union of both fractures. The functional result was excellent.



Fig 2-A. A 29-year-old man had a Winkquist-Hansen type III femoral midshaft fracture and comminuted proximal one-third fracture with joint extension by a motor vehicle accident.
B. Radiographs were made 1 year and 6 months after static intramedullary nailing for the femur and buttress plating for the tibial fracture show solid union of fractures and slight valgus angulation of the tibia. The clinical result was good.

가 3 , 4 2 (Table 4).
 , 4 1 (Fig 2). 1 , 14
 80 9 , 4 , 1 ,
 4cm 가 3 1 , 2 .
 , 2 4 3 , 1 ,



758 • / 11 4

Table 4. Result

| Blake and McBryde classification | Karlström and Olerud classification | Excellent | Good | Fair | poor | No. of cases |
|--|---|-----------|------|------|------|--------------|
| Type I | | 9 | 5 | 2 | 1 | 17 |
| Type II | | (-) | 3 | 4 | 4 | 11 |
| Total | | 9 | 8 | 6 | 5 | 28 |

Table 5. Complication

| Complication | No. of cases |
|----------------------|--------------|
| Compartment syndrome | 2 |
| Osteomyelitis | 2 |
| Fat embolism | 2 |
| Non-union | 6 |
| Total | 12 |

가

Winston²⁰⁾

가

, DeLee¹¹⁾

15

floating knee

가

90

6

15

6

3

2

,

1

,

2

1

. Ratliff¹⁷⁾

11

floating knee

1

11

3

,

4.

가

12 (43%)

2

,

가

Karlström

Olerud¹⁶⁾

32

1 ,

2

,

Heyes¹⁴⁾

가

. Veith¹⁷⁾

57

3

(Table 5).

1987 Behr⁹⁾ 6

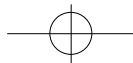
6)

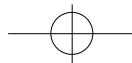
8

3

10

1





- 3) 가 2 1
floating knee
IIIa
(rigid) 가

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