

15, 2, 2002 4

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- Ilizarov -

< >

: 2, 3

Ilizarov

Ilizarov

: 1996 1 2001 2 2, 3

Ilizarov

1 가 가 34

Ilizarov

Ilizarov 20 Ilizarov

(Secondary IM nailing) 14

Ilizarov 16, 4

13, 1 Gustilo

Ilizarov 38.1 (19-66),

42.5 (18-80)

Ilizarov

Type-II 2, IIIA 7, IIIB 9, IIIC 2

II 2, IIIA 7, IIIB 5 14

9 Ilizarov

24.5

, 5

7.8

: Ilizarov 35.4,

Ilizarov 16.7

Ilizarov

1.3

Ilizarov 17.3

33.8

Ilizarov

5,

3,

13,

2

6

10

3

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Ilizarov

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1 가

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Ilizarov

: , Ilizarov

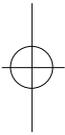
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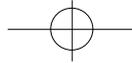
123-3 (681-320)

TEL : (052) 241-1114

FAX : (052) 241-1114

E-mail : chohyounoh@hanmail.net





II 2 , IIIA 7 , IIIB 5 Ilizarov 가 . 가

. Gustilo 9)

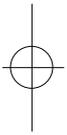
2, 3 Ilizarov . 가 10

가 , 가 , Ilizarov 4 , 2 , 10 5 , 3 , 5 가 가 3 , 2 . 가 가 2, 3 Ilizarov 가 2-3 4-6

Ilizarov Gustilo II 1 , IIIA 3 , IIIB 1 , IIIA 2 , IIIB 1 . 14 9 Ilizarov 24.5 7.8

1996 1 2001 2 Gustilo 2,3 Ilizarov , 5 Ilizarov 가가 34 Ilizarov 20 Ilizarov ESR, CSR CRP가

(Secondary IM nailing) 14 Ilizarov 16 , 4 , 13 , 1 , Ilizarov 38.1 (19-66) , 42.5 (18-80) . Ilizarov 8 , 가9 , 가3 5 , 8 < 1 > 1 . Gustilo 42 가 Ilizarov Type-II 2 , IIIA 7 , IIIB 9 , IIIC 2 , Open Type-III B ,



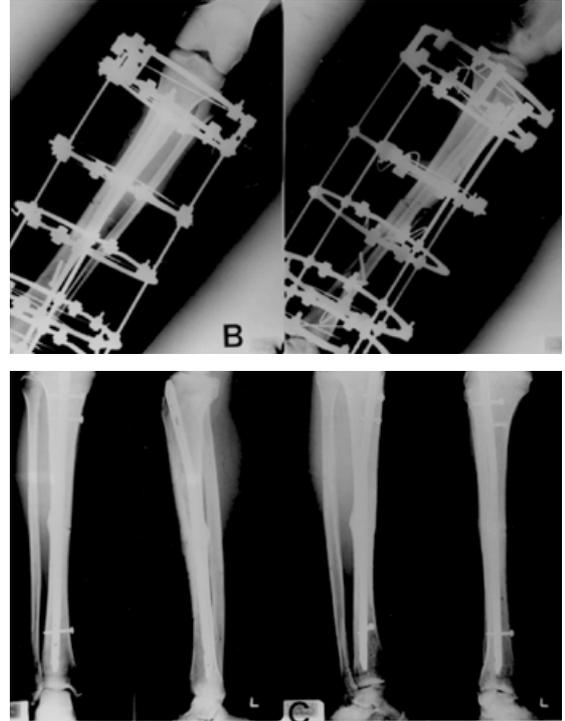
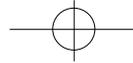


Fig 1. Gustilo grade IIIB open comminuted tibial shaft fracture of 42-year old male
A. Preoperative anteroposterior and lateral radiographs of the left tibia
B. Immediate postoperative radiographs after Ilizarov application
C. 36 weeks after secondary IM nailing, the radiographs showed bony union.
D. 2 years after first operation, the IM nail was removed.

10

36

2

(Fig.1)

Ilizarov

< 2>

2

80
IIIA

Open Type-

4
23 가

10 가

MRSA

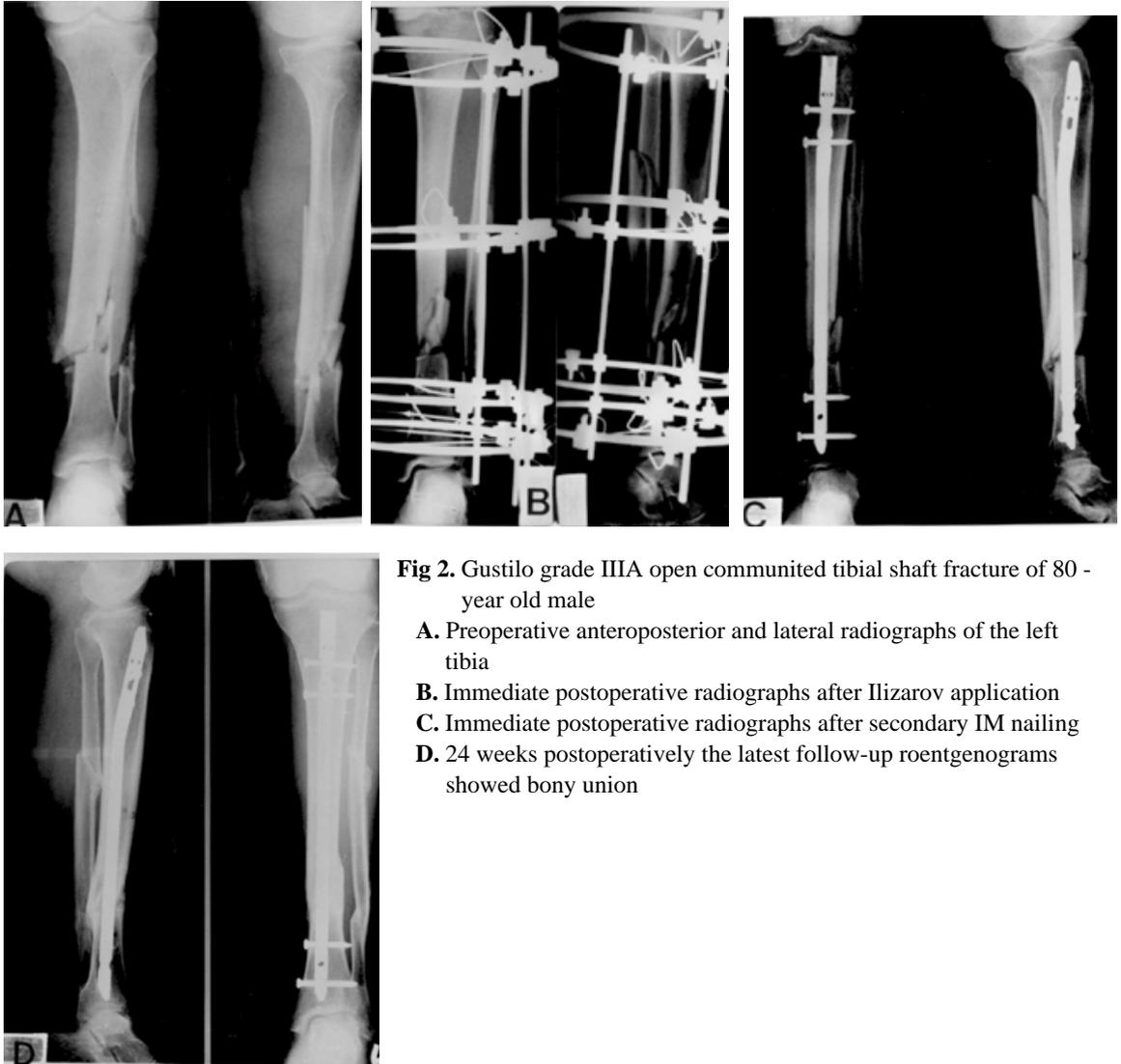
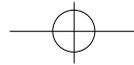


Fig 2. Gustilo grade IIIA open communitied tibial shaft fracture of 80 - year old male

- A.** Preoperative anteroposterior and lateral radiographs of the left tibia
- B.** Immediate postoperative radiographs after Ilizarov application
- C.** Immediate postoperative radiographs after secondary IM nailing
- D.** 24 weeks postoperatively the latest follow-up roentgenograms showed bony union



가
 28 . (Fig.2)

가
 6
 4
 2
 1)
 Ilizarov 35.4 ,
 Ilizarov 16.7
 Ilizarov 1.3
 17.3
 33.8
 (Table.1)



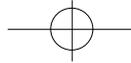


Table 1. Union time (mean week)

	Ilizarov external fixator (n=20)	Secondary IM nailing (n=14)
Ilizarov removal	35.4	16.7
Interval after removal	-	1.3
IM nailing		17.3
Average union time	35.4	33.8

n : number

Table 2. Complication

	Ilizarov external fixator (n=20)	Secondary IM nailing (n=14)
superficial infection	15	2
Deep infection	3	2
Delayed union	5	2
nonunion	2	1
Ankle stiffness	10	1

n : number

2)

Ilizarov

13

5 ,

3 ,

1

Ilizarov

1

Ilizarov

, 1 가

. (Table.2)

2

1 (12 %),

3 (10 %;11 %;12 %),

1 (6 %),

1 (7 %)

10

2

1.3cm

1.6cm

가

, 가
. Gustilo Anderson⁹⁾

. 3

2

Smith¹⁹⁾

1-3

, 3

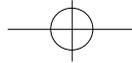
2 ,

2

Vidal²²⁾

Hoffmann

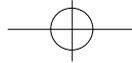




2, 3 가 . , Aho ¹⁾ Hoffmann Kuntscher
²⁰⁾ 5 , ,
^{5,17)}

Ilizarov 20 . Bone
 Johnson⁶⁾ 5 ,
 14 ,
 Gustilo type III 1 Pseudomonas
 Ilizarov 가
 가 7-10
^{2,8)} . 1989 Maurer ¹⁴⁾
 가 가 25%
 가 , 가 가 71%, 7%
 가 25% 1990 Blachut ⁵⁾ 41 17
^{2,8,12)} ,
 4). , Puno ¹⁶⁾
 , 5-7
 , 12.3 (25.5 ,
 , 7.8) Ilizarov
 , 2 9.1
^{3,10,20)} ,
 가 IIB
 1
 5
 가 ,
 Tucker ²¹⁾ 2 가
 97-100%
 Rommens Schmit- Bone Johnson⁶⁾
 Neuerberg¹⁷⁾ 21% , ,
 . 1975 Karlstrom Olerud¹³⁾가 8 , 1 ,
 5
 가 Tucker ²¹⁾
 1 , 1983 3 Ilizarov 19%, Whittle ²³⁾
 2 0%, Tornetta ²⁾ 13% ,
 McGraw Lim1) 0%
 16 Ilizarov 6 가
 50% , Ilizarov





가

Ilizarov

Skirving 가 가 가

Demmer¹⁸⁾ 가 , 가 ,

, Ilizarov 가 ,

Holbrook 11) 35% .

10 가

1/3, 1/3 , 2 ,1 , 2, 3

Ilizarov Ilizarov

^{4,7), Tucker 21) 26}

Ilizarov 가 75% ,

Chan 7) 가 60%

. Tornetta 20) Gustilo IIIb

29 10%

가 . Holbrook 11) 가

11% Ilizarov 10

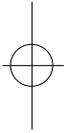
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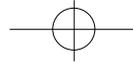
2,3 Ilizarov Ilizarov

Ilizarov

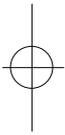
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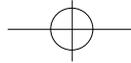
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Abstract

Treatment of Severe Open Fractures of Tibial Shaft - Comparison Between Ilizarov External Fixation and Secondary Intramedullary Nailing -

Hyoun Oh Cho, M.D., Kyoung Duck Kwak, M.D., Hong Joo Lee, M.D., Dae Hwan Lim, M.D., Sang Min Ahn, M.D., Jae Ho Chang, M.D., Kyung Ku Kang, M.D.

Department of Orthopaedic surgery, Dong Kang General Hospital, Ulsan, Korea

Purpose : We tried to compare the results of Ilizarov external fixation cases with the cases of secondary intramedullary nailing after temporary Ilizarov fixation.

Materials and Methods : From the January 1996 to February 2001, 34 cases of severe open tibial shaft fracture in adults were treated with Ilizarov external fixation and secondary intramedullary nailing after temporary Ilizarov fixation. According to Gustilo-Anderson classification, it consisted of type II 2, IIIA 7, IIIB 9, IIIC 2 cases in Ilizarov group, and type II 2, IIIA 7, IIIB 5 cases in secondary intramedullary nailing group.

Results : There was no significant difference in the union time of Ilizarov external fixation and secondary intramedullary nailing after temporary Ilizarov fixation. But the secondary nailed group had slightly better motion, less final angulation and felt more comfortable. It is the treatment preferred by patients and does not require the same high level of patient compliance as external fixation.

Conclusion : Secondary intramedullary nailing after temporary Ilizarov fixation is the useful method in the treatment of open fractures of tibia.

Key Words : Open tibial shaft fracture. Ilizarov. secondary intramedullary nailing

Address reprint requests to _____

Hyoun Ho Cho
123-3, Tae Hwa-Dong, Choong-Ku, Ulsan (681-320)
TEL : (052) 241-1114
FAX : (052) 241-1114
E-mail : chohyounoh@hanmail.net