

## Ilizarov

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: Ilizarov

: 1997 5, 2000 12

23 Ilizarov

19 가 Mast Teipner , 가

Ovadia Beals

: Mast Teipner 가 , 가

5 (26%), 11 (58%), 3 (16%) ,

1 (25%), 2 (50%), 1 (25%) . Ilizarov 3

(25%), 8 (67%), 1 (8%) , 1 (25%), 4 (25%), 2 (50%) . Ovadian Beals

가 , 가

6 (32%), 9 (47%), 4 (21%) , 3 (75%), 1 (25%), 0

. Ilizarov 5 (42%), 5 (42%), 2 (16%) ,

2 (25%), 4 (50%), 1 (25%) . 가 가

가

Ilizarov 가 4 , 1 ,

가 2 , (pin tract infection) 3

1 4 가

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: Ilizarov

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Ilizarov

: , , , , Ilizarov

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E-mail : doctorQ@anseo.dankook.ac.kr

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2000

20 90 53.8  
27 , 15 가  
2.  
가 23 (54.7%) 가  
4 (9.5%), 12 (28.5%),  
3 (7.3%)  
3.  
42 15 (35%)  
6 , 3 ,  
2 , 2 , 3 ,  
4 , 7 , 가  
가 5  
4.  
29 , 13 ,  
31 , 11

(Table 1).

**Table 1.** Type of Fracture

	Extra-articular fracture	Intra-articular fracture	Total
Closed fracture	20	9	29
Open fracture	11	2	13
Total	31	11	42

3,4)  
가 14,20).  
가 6,8,31)  
가 4,16,28), Ruedi  
Allogower<sup>28)</sup>  
Tometta<sup>32)</sup> 1994 Karas Weiner<sup>14)</sup>가 pilon  
hybrid  
3)  
5,13,15,20), 1993  
1997 5 2000 12  
1 가가  
42 , 42  
1.  
Gustilo Anderson 2, 3  
Ilizarov

(Fig. 1), 가  
Gustilo Anderson 1 4 가23 19 ,  
(Table2).  
7.

(Fig. 2) , Ilizarov  
( 6  
2 , 2 ) ,  
Ilizarov 가  
19 12 , 7 , 8 12 Ilizarov  
(PTB cast)

Table 2. Treatment

Method of treatment	EC*	EO*	IC*	IO*	Total
Plate and screws	15	4	4	0	23
Ilizarov device	9	3	5	2	19

\* EC: Extra-articular closed fracture  
EO: Extra-articular open fracture  
IC: Intra-articular closed fracture  
IO: Intra-articular open fracture

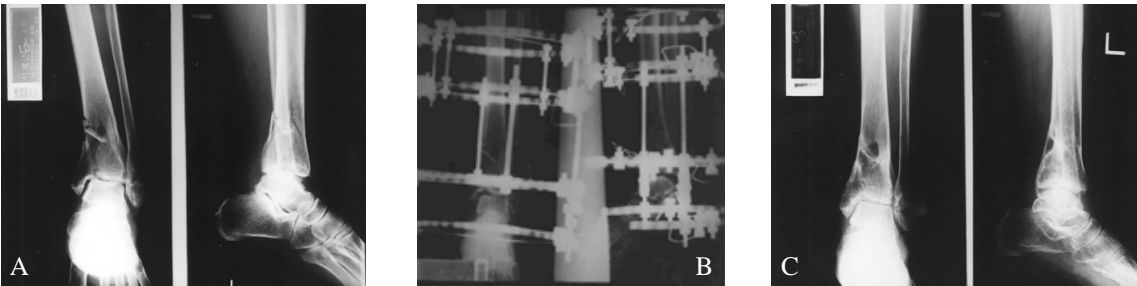


Fig. 1 : A 65-year-old male has broken his left ankle after a fall down (A). He underwent an operation for closed reduction and external fixation with Ilizarov device for the intra-articular fracture (B). The postoperative radiography in 6 months after removal of the external fixator showed complete union of the fracture (C).

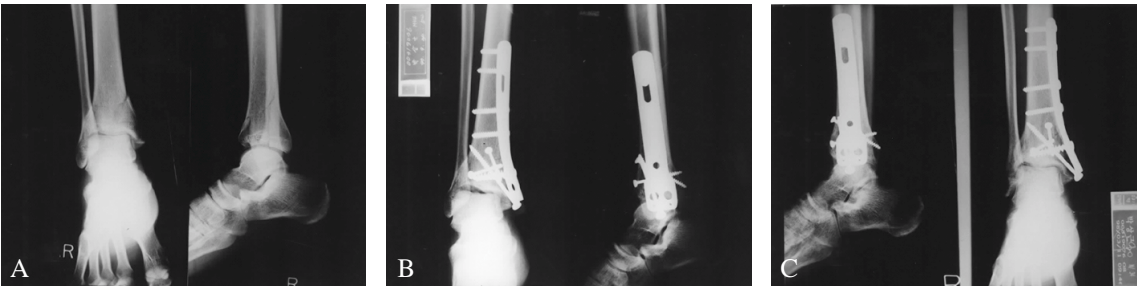


Fig. 2 : A 47-year-old male has broken his right ankle after a fall from a height (A). He underwent an operation for open reduction and internal fixation with a plate and screws for the intra-articular fracture (B). The postoperative radiography in 6 months showed complete union of the fracture (C).

**Table 3.** Functional Evaluation (Mast and Teipner<sup>20)</sup>)

Good	No pain No swelling No loss of motion compared to opposite side
Fair	Occasional mild pain not requiring medication Occasional swelling Combined loss of motion < 15 ° in extension and flexion
Poor	Pain requiring medication Swelling Loss of motion > 15 °

8. 가  
가 Mast  
Teipner 20) 가  
Ovadia Beals 가 25) .  
Mast Teipner 가  
,  
, , (Table 3).  
Ovadia Beals 가  
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, mortise ,  
(Table 4).  
(Student T-test) SPSS T-

1. 가  
Mast Teipner 가  
5 (26%), 11 (58%), 3  
(16%), , 1  
(25%), 2 (50%), 1 (25%)  
. Ilizarov  
3 (25%), 8 (67%), 1  
(8%), 1 (13%), 4 (58%),  
2 (29%) (Table 5).  
Ilizarov 가  
가 (P>0.05).  
2. 가  
Ovadia Beals  
가  
6 (32%), 9 (47%), 4  
(21%), , 3  
(75%), 1 (25%)  
Ilizarov  
5 (42%), 5 (42%), 2 (16%)  
, 2 (29%), 4 (58%),  
1 (13%) (Table 6).  
Ilizarov

**Table 4.** Clasification of Reduction of the Fracture (Ovadia & Beals<sup>25)</sup>)

	Good	Fair	Poor
Malleolus Lateral	Anatomical or 2.0mm displacement	2.0 - 5.0mm displacement	> 5.0mm displacement
Medial	2.0mm displacement	2.0 - 5.0mm displacement	> 5.0mm displacement
Posterior	Proximal displacement 2.0mm	Proximal displacement 2.0 - 5.0mm	Proximal displacement > 5.0mm
Mortise widening	0.5mm	0.5 - 2.0mm	> 2.0mm
Talus Tilt	0.5mm	0.5 - 1.0mm	> 1.0mm
Displacement	0.5mm	0.5 - 2.0mm	> 2.0mm

**Table 5.** Results of Treatment (Mast and Teipner)

Method of treatment	Good	Fair	Poor
Plate and screws Extra-articular	5	11	3
Intra-articular	1	2	1
Ilizarov fixator Extra-articular	3	8	1
Intra-articular	1	4	2
Total	10	25	7

가  
가  
( $P>0.05$ ).

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2 , (pin tract infection) 3

24).

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1

, ,

, Crenshaw

pilon

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9).

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가 가 22),

가

가

가

Bone<sup>4)</sup>

가

Rockwood Green<sup>27)</sup>, Watson-Jones<sup>33)</sup>

가 ,

가

1,7)

가 11).

10 24,30),

8-12

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가

8-12

가

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,

7-10

4,20),  
6  
12).

56 가 . ( :

8.4 )

20 가 Burwell Charnley<sup>6)</sup>  
가 Mast  
Teipner<sup>20)</sup> , Ovadia Beals<sup>25)</sup>  
가  
Mast Teipner 가 Ovadia Beals  
가 Ilizarov

가 가

Ovadia Beals<sup>25)</sup> 11%, Ruedi  
Allogower<sup>28)</sup> 15% , Pierce  
Heinrich<sup>26)</sup>

가 4 , 1  
Ilizarov  
가 2 , 3  
1 4 가  
Gustilo Anderson

1

가

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## Abstract

## Treatment of the Distal Metaphyseal Fractures of Tibia - Comparison between Internal Fixation with a Plate and screws and External Fixation with Ilizarov Device -

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**Purpose** : The purpose of this study was to compare the results between open reduction and internal fixation with plate and screws and closed reduction and external fixation with Ilizarov device for the fracture of distal metaphyseal fracture of tibia.

**Materials and Methods** : In this study, the results in treatment of the 19 distal metaphyseal fractures of tibia with closed reduction and external fixation with Ilizarov device were compared with those in treatment of the 23 fractures with open reduction and internal fixation with a plate and screws. The cases were the patients who had been treated for the fractures at the Department of Orthopaedic Surgery, Dankook University Hospital from May 1997 to December 2000. The results of treatment were analysed using functional evaluation by Mast and Teipner and radiological evaluation by Ovadia and Beals.

**Results** : The results were as follows:

1. The major causes of injury were motor vehicle accidents, fall-downs, and falls from a height in order.
2. Treatment of the fractures with closed reduction and external fixation with Ilizarov device showed comparable results to that with open reduction and internal fixation with a plate and screws.
3. Complications in treatment were a little more frequent in open reduction and internal fixation with a plate and screws than in closed reduction and external fixation with Ilizarov device.

**Conclusion** : Considering the results, closed reduction and external fixation with Ilizarov device is thought to be one of recommendable options in treatment of the distal metaphyseal fractures of tibia with the advantages in wound management, prevention of stiffness of ankle joint, and convenience in removal of the device.

**Key words** : Distal metaphyseal fractures of tibia, Open reduction, Internal fixation with plate and screws, Closed reduction, External fixation with Ilizarov

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