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< >

:

:

87

(EF)

(IIF)
Gustilo

(DIF1, DIF2)

, Gustilo

:

I, II, IIIa, IIb

IIIc

5.7, 8.6, 7.1

9.7

18.0

IIF, DIF1, DIF2,

EF

7.2

5.5

10.7

13.1

6.3

6.9

10.6

8.6

8.8

8.6

가

: I, II, IIIa

IIIb

IIF, DIF1, DIF2

EF

I, II, IIIa

IIIb

:

, ,

:

634-18

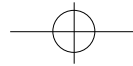
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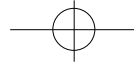
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*





1,9,10,14,16,17,23,29). Rockwood Green²²⁾



I, II, III

III

5,18)

, 가

가

가

가

I

5.7

, II 8.6

, IIIa

가

7.1

, IIIb 9.7

, IIIc 18.0

가

가

가

5)

Rothenthal

Macphail²⁴⁾

75%

30).

가 Velozco

33)

88%가

가 80%

가

가

가

Sarmiento²⁵⁾

(bending movement)

. Weissman

35) Sarmiento²⁵⁾18,20). Gustilo¹²⁾

가

1

,

16)

가

, 2

8.6

,

8.8

,

6.6

가

3

가

Clancey

Hansen⁸⁾

I

II

II

III

. Chapman

. Chapman, Anderson^{2,6,7)}Mahoney⁶⁾

I, II, IIIa

Ellis^{10,11)}Bergenz⁴⁾

Sarminento

26)

,

IIIb, IIIc

.

.

29) 75

Nicoll²⁰⁾

37

1

,

,

2

가가

,

,

2

(33)

2

21). Velazco³³⁾, Veliskakis³⁴⁾, Hampton

13)

,

3

(5)

3

가

Trueta³¹⁾, Sladeck²⁸⁾

,

,

,

, Gustilo

가

가

Skirving Demmer²⁷⁾

가

Nicoll²¹⁾



48 • / 15 1

15%
 . Bach Hansen³⁾
 19%
 Harvey¹⁵⁾
 13.6%
 , , ,
 가 가 Merriam Porter¹⁹⁾ 50%
 , 60%
 Van der Linden Larsson³²⁾ 50 9
 , 2 , 2 , 4
 .
 18 , 6 , 5 , 15 ,
 10 가

Table 3. Level of fracture and union time

Fx level	Cases	Union time (Month)
Upper 1/3	30	8.6
Middle 1/3	34	8.8
Lower 1/3	23	8.8

Table 4. Union time and deep infection rate of open tibia fracture

Types of Fx	I	II	IIIa	IIIb	IIIc
Union time (month)	5.7	8.6	7.1	9.7	18.0
DIR (%)	0%	22.7%	7.7%	30.3%	50.0%

Table 5. Union time and deep infection rate in various causes of injury

Cause	TA	Pedestrian	Motorcycle	BT and FD
Union time (month)	10.6	6.1	8.3	9.7
DIR	15%	10.5 %	9.6%	35.3%

Table 1. Age / sex distribution of open tibia fracture

Age	Sex	Male	Female	Total
20 below		9	1	10
21-30		12	2	14
31-40		19	3	22
41-50		11	1	12
51-60		13	2	15
60 over		10	4	14
total		74	13	87

Table 2. Causes and types of open tibia fractures (by Gustilo)

Cause	Type I	II	IIIa	IIIb	IIIc	Total
TA	5	6	2	4	3	20
Pedestrian	5	4	4	4	2	19
Motor cycle	10	5	4	9	3	31
Blunt trauma	1	2	1	2		6
Fall down	3	5	2	1		11
Total	24	22	13	20	8	87

Table 6. Union time with respect to various fixation regimens

Fixation regimen	IIF	DIF1	DIF2	EF
Union time (month)	7.2	5.5	10.7	13.1
DIR	0%	4.2%	0%	50%

Table 7. Time to union in various types of fixation

Type fx	IM nailing	Plate and screws	External fixation
Union (month)	6.3	6.9	10.6
DIR	2.7%	0%	39.4%

IIIb Gustilo I, II, IIIa
 (IIF, DIF1, DIF2)



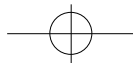
IIIb (I, II, IIIa)
IIIb IIIc

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Abstract

Operative Treatment of Open Tibial Fracture

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Purpose : The purpose of the present study was to clarify the contributing factors, such as the method of fracture stabilization, type of internal fixation and the deep infection rate(DIR) in the treatment of open tibial fractures.

Material and Methods : We made a retrospective study of these 87 open tibial fractures treated with various fixation method. Patients were divided into immediate internal fixation(IIF) group, delayed internal fixation(DIF) group and external fixation(EF) groups. Fixation methods, deep infection rate related with fixation devices and time to bone union were compared and analyzed according to the Gustilo 's classification.

Results : The mean time to union in open type I, II, IIIa, IIIb, and IIIc was 5.7 months, 8.6 months, 7.1 months, 9.7 months, and 18.0 month respectively. The mean time to union in group IIF, DIF1, DIF2 and EF was 7.2 months, 8.1 months 5.5 months, and 10.7 months and 13.1 months. The mean time to union of group using a interlocking IM nailing, plate and screws, and external fixator was 6.3 month, 6.9 months, and 10.6 months.

Summary : We concluded that there is an advantage of immediate internal fixation over external fixation in the prevention of infection and promotion of fracture healing in the treatment of open tibia fractures. Immediate internal fixation could be recommended for type I, II, IIIa and some cases of IIIb open tibia fracture.

Keyword : Open tibia fracture, Deep infection rate, Nonunion