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가

: 1995 7 1998 4  
25

25

(17 )

(8 )

:

36.8

4 6

5.4

8

가

1

Paley

가 20

:

: , , , , ,

4,12)

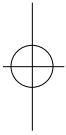
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, , 2mm (flexible reamer), Papineau , 4,5,20), vancomycin 가 , 가 ( ), 3 cephalosporin cefotaxim ( ), gentamicin( ) 가 , 1gm (Osteobond; Zimmer, Warsaw, IN, USA) polymer 40gm (methyl metacrylate monomer) 21). 가 , Dynar Exter (Hyupjin, Seoul, Korea) 15 , Ilizarov (Smith-Nephew, Memphis, TN, U.S.A.) 7 , Ilizarov Dynar Exter 3 1995 7 1998 4 12 가가 가 19 , 25 가 6 18 57 (closed suction drainage catheter) 가 33 가 5 36 25 12 , 13 2 , 20 , 5 cefalosporin 1gm 3 amikacin 250mg 2 , 20 12 , 8 가 C- 2 10 4 4 6 1 9 4.3 , , Pulsavac(Zimmer, Warsaw, IN, USA) 가 4 cm 17 (68 %) 가 6 cm 8 (32%)



4.5 cm(0.5-8cm)

Bacteria	No. of Cases
<i>S. aureus</i>	
coagulase (+)	13
coagulase (-)	1
<i>Pseudomonas</i>	3
<i>Enterobacter</i>	2
<i>E. coli</i> 1	
Group D. <i>Streptococcus</i>	1
<i>Serratia</i>	2
None	2
Total	25

(Table 1).

,

(fibular

osteoseptocutaneous flap)

6

36.8

9

(patellar tendon weight bearing

brace)

3

5

가

가

가 가

,



**Fig 1.** Initial radiographs of 57-year-old man with infected nonunion of the tibia.



**Fig 2A.** Anteroposterior radiographs after sequestrectomy and antibiotics impregnated cement beads with external fixation.



**2B.** Lateral radiographs after sequestrectomy and antibiotics impregnated cement beads with external fixation.

가

4,18,19)

6 cm

8

가

III

가

1,6,13)

3)

7,15)

가

3

2,9,10,17)

1991 1

1992 12

17-50%

22

3)

14

vancomycin

8

5 gentamicin

cephalosporin

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1,13)

8,10,14)

4 cm

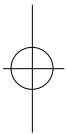


**Fig 3A.** Immediate anteroposterior radiographs after cement beads removal and iliac cancellous bone graft.

**3B.** Immediate lateral radiographs after cement beads removal and iliac cancellous bone graft.



**Fig 4.** 6 months after bone graft, The radiographs show complete bony union.



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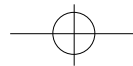
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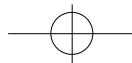
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## Abstract

## Two-Stage Treatment of Infected Nonunion of the Tibia using Antibiotics Impregnated Cement Beads and External Fixator

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**PURPOSE :** To evaluate the results of two-stage treatment for infected nonunion of the tibia using antibiotics impregnated cement beads(AICB) and external skeletal fixation.

**MATERIALS AND METHODS :** We analyzed 25 infected tibial nonunion that were treated with AICB and external skeletal fixation from July 1995 to April 1998. The average follow-up was 25 months. In the first stage, sequestrectomy and radical debridement was performed. and then the soft tissue and bony defects were filled with AICB and was stabilized with external skeletal fixation. In the second stage, after removal of AICB and the nonunion site was either grafted with autogenous cancellous bone graft(17 patients) or internal bone transport(8 patients) was performed according to the bone defect size.

**RESULTS :** The average bony union time was 36.8 weeks. The intervening time between the first and second stages of treatment was 4 to 6 weeks (average 5.4 weeks). There were 8 pin tract infections, 1 Postoperative infection after the second-stage bone grafting. According to Paley 's functional assessment system, excellent or good results were obtained in 20 cases. There was no poor result.

**CONCLUSION :** In our opinion, the above advocated two-stage treatment is an acceptable treatment modality for the management of infected tibial nonunion.

**Key Words :** Tibia, Infected nonunion, Antibiotics impregnated cement beads, External fixation, Two-stage treatment

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