

원위 경골 골절에서 관절 주위 금속판을 이용한 최소 침습 경피적 금속판 골유합술

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목 적: 원위 경골 골절에서 관절 주위 금속판 (Zimmer, Warsaw, IN, USA)을 이용한 최소 침습 경피적 금속판 골유합술의 임상 결과를 보고하고자 하였다.

대상 및 방법: 원위 경골 골절로 관절 주위 금속판을 이용하여 최소 침습 경피적 금속판 골유합술을 시행한 총 29예 중, 1년 이상 추시가 가능하였던 27예를 대상으로 하였다. 수술 후 골유합까지의 기간, 수술 후 합병증, 금속판에 의한 피부 자극 정도에 대한 VAS 점수, Olerud and Molander ankle score를 이용한 임상 평가를 시행하였다.

결 과: 수술 후 평균 추시 기간은 21개월이었다. 수상일로부터 수술일까지는 평균 6일이 소요되었다. 원위 비골 골절이 10예에서 동시에 존재하였다. 평균 골유합 기간은 14주였고, 합병증으로 5° 이상 각 변형이 1예 있었다. 금속판 주변의 피부를 압박하였을 때의 통증 정도는 VAS 점수상 평균 2.2점이었고, 일상 생활 중에 금속판 주변의 통증은 VAS 점수상 전 예에서 0점이었다. 족관절 기능적 평가에서 평균 90.2점으로 만족할만한 결과를 보였다.

결 론: 원위 경골 골절의 치료 방법으로 최소 침습 경피적 금속판 골유합술에 사용된 관절 주위 금속판은 가골 형성이 거의 없는 골유합을 이루어 견고한 고정력이 있는 것으로 판단되었고, 금속판에 의한 피부 자극이 거의 없는 장점이 있었다.

색인 단어: 원위 경골, 골절, 최소 침습 경피적 금속판 골유합술, 관절 주위 금속판

Minimally Invasive Percutaneous Plate Osteosynthesis Using Periarticular Plate for Distal Tibial Fractures

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Purpose: To evaluate the clinical results of minimally invasive percutaneous plate osteosynthesis using a periarticular plate (Zimmer, Warsaw, IN, USA) for distal tibia fractures.

Materials and Methods: 27 patients with distal tibia fractures were treated operatively by minimally invasive percutaneous plate osteosynthesis. The patients were followed for at least 1 year. The duration for bone union, complications after the surgery, the amount of skin irritation at the site of plate insertion was evaluated using the VAS score and the Olerud and Molander ankle score. The average age of the patients was 56 years old (range, 30~81 years) with an average follow up period of 21 months (range, 12~30 months).

Results: The average time from trauma to surgery was 6 days (range, 2~19 days). 10 cases showed an associated distal fibular fracture. The average time for bone fusion was 14 weeks (range, 8~40 weeks) with 1 case of angular deformity with more than 5 degrees. The amount of skin irritation due to the periarticular plate resulted in a VAS score of 2.2 points. Evaluation of the ankle function test showed an average of 90.2 points, resulting in satisfactory.

Conclusion: The periarticular plate used in minimally invasive percutaneous plate osteosynthesis for distal tibia fractures was concluded to give a firm fixation of the fracture site as bony fusion could be acquired without any callus formation, and few skin irritation due to plate has seem to be an advantage.

Key Words: Distal tibia, Fracture, Minimally invasive percutaneous plate osteosynthesis (MIPPO), Periarticular plate

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2007

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2005

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서 론

(anatomically pre-shaped)

(Zimmer, Warsaw, IN, USA)

가

대상 및 방법

1. 대상 및 방법

2004 5 2005 12

(Minimally invasive percutaneous plate osteosynthesis)^{2,3,8,24)}

27

가

56

Table 1. Demographic data of the patients

Cases	Age	Sex	Injury mechanism	AO/OTA classification	Fibular fracture	Timing of bone union (weeks)	Complications	Implant size (Hole)	VAST [†]	VASD [§]	Ankle Scoring
1	62	M	SD*	A2	No	13		12	2	0	G (90)
2	35	F	SD	A2	No	11		10	0	0	G (95)
3	30	M	SD	A2	No	14		12	0	0	G (90)
4	60	M	SD	A2	No	15		10	4	0	S [†] (85)
5	56	F	SD	A3	Yes	16	6° varus	10	6	0	U** (75)
6	50	M	SD	C2	No	40		8	4	0	S (85)
7	53	M	SD	A2	Yes	12		8	2	0	G (90)
8	38	F	SD	A3	No	13		10	2	0	G (90)
9	70	M	TA [†]	A1	No	18		10	2	0	S (85)
10	37	F	SD	C2	No	16		12	2	0	G (90)
11	50	M	SD	A3	No	10		12	4	0	G (95)
12	62	M	SD	A2	No	8		12	0	0	G (95)
13	53	F	TA	A2	Yes	14		8	2	0	G (90)
14	46	M	SD	A3	No	12		12	2	0	G (95)
15	75	F	SD	A2	Yes	18		10	4	0	G (90)
16	77	M	SD	A2	Yes	8		10	0	0	G (95)
17	76	F	SD	C2	Yes	12	Flap surgery	8	4	0	S (80)
18	60	M	SD	C2	No	8		10	0	0	G (95)
19	75	M	SD	A2	No	15		12	4	0	G (90)
20	50	F	SD	A3	Yes	8	Infection	8	2	0	G (95)
21	55	M	SD	A2	No	20		10	2	0	G (90)
22	31	M	SD	A3	Yes	12	Infection	14	4	0	G (90)
23	53	M	SD	C2	No	13		12	2	0	G (95)
24	66	F	SD	A1	No	20		10	2	0	G (90)
25	81	F	SD	A2	No	9		8	0	0	G (95)
26	53	F	SD	A3	Yes	8		8	0	0	G (95)
27	56	M	SD	A2	Yes	14		14	2	0	G (90)
Mean	55.9					13.9			2.1	0	G (90.4)

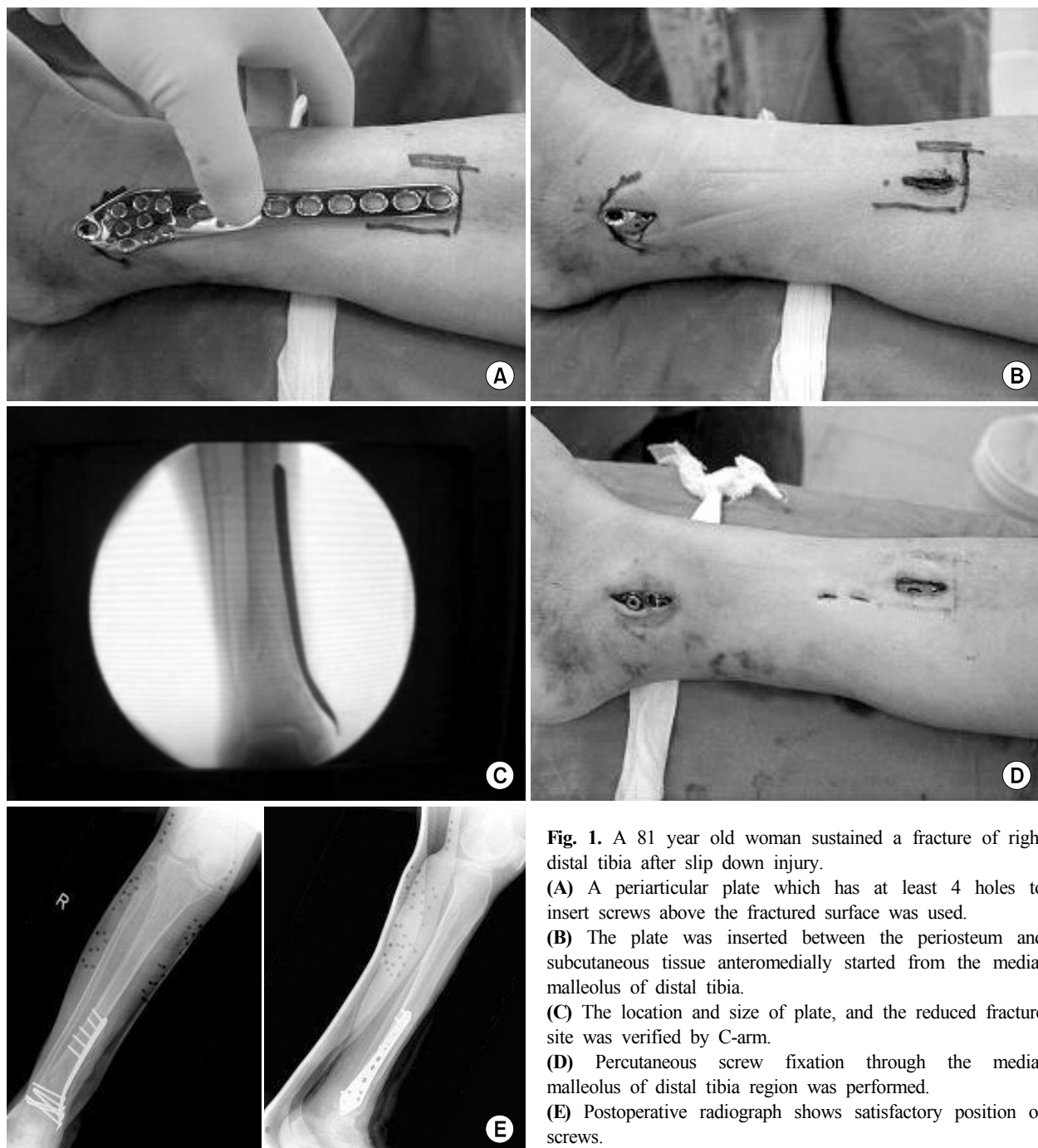
*SD: Slip down, [†]TA: Traffic accident, [†]VAST: Visual Analogue Score (Touch), [§]VASD: Visual Analogue Score (Daily living), ^{||}G: Good, [†]S: Satisfying, ^{**}U: Unsatisfying

(, 30~81) , 가 16 , 11 .
 21 (12~30) .
 가 25 , 가 2 .
 (anteromedial surface of tibia)
 가
 , 가
 2 cm 가 , 가
 가
 (Fig. 1B).
 (Fig. 1C).
 1 ,
 가
 ,
 가
 1
 ,
 가
 1
 .
 (oblique or spiral fracture)
 가 , lag screw
 4 ,
 5
 (Fig. 1D, E).
 1 cm
 가
 가
 (Visual Analogue Scale Pain Score, VAS score)
 . ' 0 , ' 가
 . ' 2 , ' .
 4 , ' . ' 6 , ' 3. 수술 후 처치
 . ' 8 , ' .
 . ' 10 가 Olerud and
 Molander ankle score¹⁹⁾ , 90 , 7
 80~90 , 80 .

2. 수술 방법

(Patellar tendon bearing)

가 가 2
 C 6
 4
 (Fig. 1A). 2
 3 cm 가 , ~4 ,



결 과

가 50% 가 .
 가
 bridging callus가

10 . 4
 , 6
 2 19 , 6 .

가 , 가

5,17) , , 7,10,11,15) ,

1,22) , 가 7-10,12,14,16,20,23) ,

가 , 20) ,

4,6,16) ,

2,3,8,24) ,

가 ,

2 , , low grade ,

(biologic ,

fixation) 2) ,

가

가 , 13) .



Fig. 3. A 70 year old man sustained a fracture of left distal tibia after traffic accident.

(A) Preoperative radiograph show left distal tibia fracture.

(B) Postoperative radiograph after minimally invasive percutaneous internal fixation with periarticular plate.

(C) The ninety week post-operative radiograph after metal removal shows stable bony union without any callus formation.

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