

< >

: 2-4cm

가

가 : 1985 1 1997 12  
136 (76%), 46mm (50%)

34mm (9%), 35-45mm

: 121 (89%)

125 (91.9%)

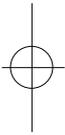
35-45mm

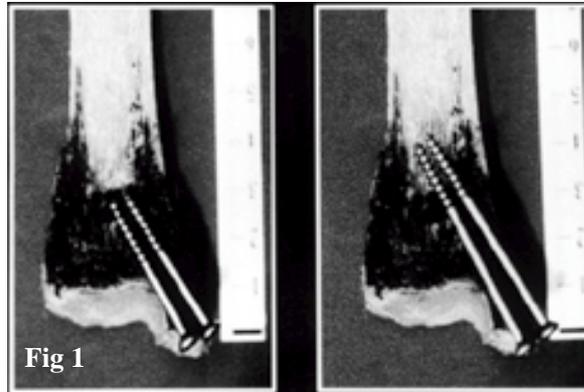
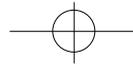
, Meyer

가 40mm

2-4 cm

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**Fig 1.** The cross sections of distal tibia of the Cadevar show densest cancellous area above ankle joint.



**Fig 2.** Distal densest area can give enough purchase of the 40mm length screw threads.

<sup>11)</sup>(Figure 1,2),

Lauge-Hansen <sup>7)</sup>  
<sup>6)</sup> , Lauge-Hansen -  
47 (29%),  
64 (47%) 가 (Table 1). 가

가 1 mm

1985 1 1997 12

1 2

2

K-

가 136

10 19.8 . 136 가  
99 (73%), 가 37 (27%) 가 2.7

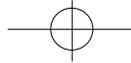
65% 34.3 , 13 73 4.0mm  
20 30 가 (malleolar) 가 3 , (cannulated) 2 ,  
(cortical) 2 20mm  
78 (58%) 가 27 (20%), 70mm 76 (56%)  
16 (12%), (10%) , 35-45mm 가  
가 18 . 44mm . 79

가 9 가

1

1-2 K-





**Table 1.** Classification of the ankle fracture

Lauge-Hansen	No	Anatomical site	No
Pro.*-Ext. †	30		
Sup. ‡-Ext.	47	Medial malleolar Fx	64
Sup.-Add. §	26	Bimalleolar Fx.	53
Pro.-Abd. ¶	8	Trimalleolar Fx.	19
Unclassified	25	(T-F diastasis)	(11)
Total	136		136

\* Pro:Pronation

† Ext:External rotation

‡ Sup:Supination

§Add:Adduction

¶ Abd:Abduction

**Table 2.** Union time by screw length

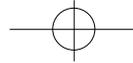
Screw length	No.	Average union time(wks)
34mm	9	10
35-45mm	76	9.6
46mm	50*	11.9
Total	135	10.5

\* Except one case nonunion which was used 70mm Malleolar screw



53 2  
 1 3  
 . 1.  
 가 3 , 2 3 , 1  
 62 58 6 20  
 (94%) , 2 Rush , 10.5 .  
 2 .  
 가 55 (40%) 4 34mm , 35-45mm  
 46mm  
 45mm 35-  
 . 81 (60%) 30 (P>0.05)(Table 2).  
 가 53 , 1 가  
 2 1 K- 가  
 76 (P>0.05)(Table 3).  
 Meyer Kumler 10)



**Table 3.** Differences of union time by number of implants

	No.	Average union time(wks)
3 screws	3	10.7
2 screws	52	10.2
1 screw	1	11.0
1 screw, 1k-wire	76	10.6
1 screw, 2k-wire	3	10.2
Total	135	10.5

\* Except one case nonunion which was used 70mm Malleolar screw

**Table 4-A.** Clinical result by Meyer and Kumler

Type	Excellent	Good	Fair	Poor	Total
Pro.*-Ext. †	13	14	2	1	30
Sup. ‡-Ext.	11	31	2	1	47
Sup.-Add. §	4	19	2	1	26
Pro.-Abd. ¶	2	3	2	-	8
Unclassified	6	15	4	-	25
Total	38	83	12	3	136

\* Pro:Pronation

† Ext:External rotation

‡ Sup:Supination

§Add:Adduction

¶ Abd:Abduction

**Table 4-B.** Radiological result by Meyer and Kumler

Type	Excellent	Good	Fair	Poor	Total
Pro.*-Ext. †	11	16	1	2	30
Sup. ‡-Ext.	30	13	2	2	47
Sup.-Add. §	17	7	1	1	26
Pro.-Abd. ¶	6	1	1		8
Unclassified	16	8	1		25
Total	80	45	6	5	136

\* Pro:Pronation

† Ext:External rotation

‡ Sup:Supination

§Add:Adduction

¶ Abd:Abduction

2.

가

Meyer Kumler

(Table 4-A,B).

121 (89%)

Meyer

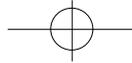
125 (91.9%)

(Table 5-A,B),

1

1

K-



**Table 5-A.** Clinical result by Meyer and Kumler according to screw length

Screw length	Excellent	Good	Fair	Poor	Total
34mm <	2	6		1	9
35-45mm	20	50	6		76
46mm >	16	18	3	2	51
Total	38	83	12	3	136

**Table 5-B.** Radiological result by Meyer and Kumler according to screw length

Screw length	Excellent	Good	Fair	Poor	Total
34mm <	5	3		1	9
35-45mm	46	24	3	2	76
46mm >	29	18	3	2	51
Total	80	45	6	5	136

2

가

. Burwell Chamley<sup>4)</sup>

38 (20-50 ),

13 (0-20 )

가

,<sup>8)</sup>

가

3.

5 , 70mm

가

. Bross Bisschop<sup>2)</sup>

1 , 4 ,

1 가

가 ,

1/3

가

Weber

. Beauchamp <sup>1)</sup> 50

126

50

2,3,6)

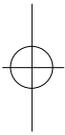
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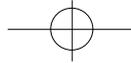
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가

, Tile<sup>12)</sup>

Mast Teipner <sup>9)</sup>





2

40 mm

가

1mm 가

가

가 1 2 K- 2

Rockwood <sup>11)</sup>  
2-4 cm

89% ,  
91.9% ,  
Chung <sup>6)</sup>

45mm 46mm 34mm , 35-  
35-45mm

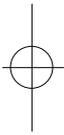
가

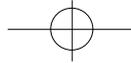
(Pitch)가

가

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## Abstract

## PROPER SCREW LENGTH FOR FIXATION OF THE MEDIAL MALLEOLAR FRACTURE OF ANKLE

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**Purpose** : There is rare report about screw length in ankle fracture in spite of the anatomical characteristic that distal densest area can give enough purchase of screw threads for fixation of medial malleolar fragment. Purpose of the current study is to evaluate the results of screw fixation and to estimate proper screw length in medial malleolar fracture.

**Materials and Methods** : Authors retrospectively reviewed 136 cases of medial malleolar fracture which had been performed from January 1985 to December 1997. The patients were divided into 3 groups according to screw length ; under 34mm screw length (9 cases), between 35mm and 45mm (76 cases), over 46mm (50 cases). Each group was evaluated bone union time, clinical outcomes and radiological results by Meyer and Kumler.

**Results** : Good and excellent results were achieved 121 cases (89%) on clinical result and 125 cases (91.9%) on radiological result by Meyer criteria. There were no statistical differences between three group, but the 35mm-45mm screw length group showed slightly faster union tendency.

**Conclusion** : In the treatment of medial malleolar fracture, around 40mm length screw is sufficient for fixation and it doesn't need to use the screw over 45mm length for more rigid fixation.

**Key Words** : Ankle, Medial malleolar fracture, Screw fixation, Screw length

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