

[]

: 가

: 18

(mortise view)

(Talocrural angle)

(Lateral malleolar angle)

가

2

(Bimalleolar angle)

36

: 78.4° (74°~82°)

78.3° (73°~86°)

36.7° (30°~41°) .95%

2.1°

3.0°

1.2°

1.5°

1.6°

0.4°

1.3°

2.4°

1.0°

: 가

가

:

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*

28

*

2002

가
4,5,8,9,11)
1950
1,2), 1960
(Talar tilt)
(medial clear
space)
6,7)
가 ,

4,5,8,9)
가 ,
가 가
3~5,8,10)
David 5)
가
2 mm
2 mm 가
가

18
36
(Mortise view)
가 9 , 가 9 ,
25 42
15°
(Mortise view)



Fig. 1. Talocrural angle is the angle of superomedial quadrant of four planes constructed by a line drawn connecting the tips of both malleoli and a perpendicular line to the tibial plafond surface.

2 가
가 2
(Talocrural angle),
(Bimalleolar angle),
(Lateral malleolar angle) 가
(Talocrural angle) Weber⁴⁾가

(Fig. 1),
(Bimalleolar angle) Rolfe³⁾

(Fig. 2),
(Lateral malleolar angle)



Fig. 2. Bimalleolar angle is the angle between a line connecting tips of both malleoli and a vertical line which is parallel to long axis of the distal fibula.



Fig. 3. Lateral malleolar angle is the angle between a line connecting tips of both malleoli and a line connecting the tip of medial malleolus and lateral end of subchondral bone plate of the distal tibia.

가
SPSS 11.0 for Windows
linear model

(Fig. 3),

General

(Mortise view)
(Talocrural angle) 78.4°
, 73° 86°
(Bimalleolar angle) 78.3°
86°
(Lateral malleolar angle) 36.7°
, 30° 41°
(Table 1).

1
(Talocrural angle) 1
1.16±1.24° (: 0.0°~3.0°)
2 0.40±1.40° (: 0.0°~3.0°)

(Bimalleolar angle) 1
0.94±2.09° (: 0.0°~5.5°)
2 0.52±2.28° (:
0.0°~5.0°).

1 0.22±0.82° (: 0.0°~2.0°)
, 2 0.44±1.29° (: 0.0°
~2.5°)
(Table 2).

95%
(Talocrural angle) 2.1°
(Bimalleolar angle) 3.0°
(Lateral malleolar angle) 1.2°
(reproducibility)

2 (Talocrural angle) 1.5°
(Bimalleolar angle) 1.6°
(Lateral malleolar angle) 0.4°
(Talocrural angle) 1.3°
(Bimal-

Table 1. Average and Range of Angular Measurements of Mortise Radiographs in 18 Healthy Volunteers

	Mean	Minimum	Maximum
TCA [*] (°)	78.4	73	86
BMA [†] (°)	78.3	73	84
LMA [‡] (°)	36.7	30	41

^{*}; Talocrural angle, [†]; Bimalleolar angle,
[‡]; Lateral malleolar angle

Table 2. Each Observer's Differences of Both Sides of Angular Measurements

	Observer 1	Observer 2
TCA [*] (°)	1.16±1.24	0.40±1.40
BMA [†] (°)	0.94±2.09	0.52±2.28
LMA [‡] (°)	0.22±0.82	0.44±1.29

^{*}; Talocrural angle, [†]; Bimalleolar angle,
[‡]; Lateral malleolar angle

leolar angle) 2.4°, (Lateral malleolar angle)
 1.0° (Late-
 ral malleolar angle), (Talocrural angle),
 (Bimalleolar angle),

(Table 3).

Ramsey⁸⁾

1 mm
 40%가

가

, David⁵⁾

, 2 mm

5°

가 가

Table 3. Intra- and Inter-observer's Differences of Angular Measurements

	TCA [*] (°)	BMA [†] (°)	LMA [‡] (°)
Intraobserver	1.5	1.6	0.4
Interobserver	1.3	2.4	1.0

^{*}; Talocrural angle, [†]; Bimalleolar angle,
[‡]; Lateral malleolar angle

. Weber⁴⁾

1976 Sarkisian Cody

(Talocrural angle)

, (Talocrural
 angle)

가

¹⁰⁾. Sarkisian Cody¹⁰⁾
 2°

2° 5°
 (Talocrural angle)

^{3,8)}, (Talocru-
 ral angle),

X-ray

Rolfe³⁾

(Bimalleolar angle)

(Goniometer)

(Bimalleolar angle)

2.4° (95%) (Talocrural angle)

2.7° (95%)

(Bimalleolar angle)

1° 1 mm

(Bimalleolar angle)

가

가

(Talocrural angle) 2.1° (95%), (Bi-malleolar angle) 3.0° (95%),

가

(Lateral malleolar angle) 1.2° (95%)
) , (Bimalleolar angle)

가

David ⁵⁾

(Mortise view)

2 mm

가

가

, Rolfe ³⁾

(Talocrural angle)

가

2.7°, (Bimalleolar angle) 2.4°

2° (=2 mm) ,

(Lateral malleolar angle) ,

(Talocrural angle) 2.1° ,

가

가

(Bimalleolar angle) 3.0° 2° (=2 mm)

(Lateral malleolar

angle)

1.2°

(Talocrural an-

gle) (Bimalleolar angle)

(Lateral malleolar angle)

(Bimalleolar angle)

(Talocrural angle)

가

(Lateral malleolar angle)

가

가

가

(Lateral malleolar angle)

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Abstract**Radiological Assessment for Distal Fibular Length****Il Hoon Sung, M.D., Jong Min Lee, M.D.***Department of Orthopaedic Surgery, Hanyang University Hospital, Seoul, Korea*

Purpose: This study was performed to reevaluate the radiological parameters for assessing the length of the distal fibula in the mortise view of the ankle and to introduce a more reliable method to lessen measurement error.

Materials and Methods: Mortise view radiographs of 36 normal ankles from 18 healthy volunteers were obtained. The talocrural angle and bimalleolar angle were measured two times and compared bilaterally by two independent observers. Also, The lateral malleolar angle, newly devised in our department was measured and compared bilaterally.

Results: The average of the talocrural angle, bimalleolar angle, and lateral malleolar angle was 78.4 degrees (range 74 to 83), 78.3 degrees (range 73 to 86), and 36.7 degrees (range 30 to 41), respectively. The difference of the talocrural angle, bimalleolar angle, and lateral malleolar angle between right and left was 2.1 degrees, 3.0 degrees, and 1.2 degrees (95% confidence limit), respectively. Intraobserver difference of the talocrural angle, bimalleolar angle, and lateral malleolar angle was 1.5 degrees, 1.6 degrees, and 0.4 degrees, respectively. Interobserver difference of the talocrural angle, bimalleolar angle, and lateral malleolar angle was 1.3 degrees, 2.4 degrees, and 1.0 degrees, respectively.

Conclusion: When using various measurement methods to judge the length of the distal fibula, the measurement error should be considered. The proposed method, lateral malleolar angle, would be a good method for assessing the length of distal fibula in the mortise view of ankle.

Key Words: Distal fibular length, Mortise view, Radiological assessment

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