

12, 4, 1999 11

The Journal of the Korean Society of Fractures
Vol.12, No.4, November, 1999

= Abstract =

Surgical Treatment of the Bimalleolar Ankle Fractures

**Kyung-Jin Song, M.D., Keun-Ho Yang, M.D., Kyung-Rae Lee, M.D.,
Ju-Hong Lee, M.D., and Byung-Yun Hwang, M.D.**

*Department of Orthopaedic Surgery, College of Medicine,
Institute for Medical Science, Chonbuk National University, Chonju, Korea*

We designed this study to evaluate the functional outcome and to suggest the guidelines in the treatment of bimalleolar ankle fractures with clinical and radiological analysis after operative treatment.

We analyzed 36 patients with bimalleolar fractures among 90 ankle fractures and followed up for more than 1 year. All 36 fractures were classified according to Lauge-Hansen system and the Meyer criteria was used for the clinical and radiological assessment.

Seventeen cases(47%) were supination-external rotation(47%); 9 cases(25%) were supination-adduction; 6 cases(17%) were pronation-abduction and 4 cases(11 %) were pronation-external rotation type. Satisfactory results was obtained in 32 cases(89%) according to the criteria of Meyer in the viewpoint of clinical and radiological analysis.

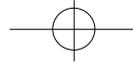
Satisfactory results could be obtained with early anatomical reduction and rigid internal fixation for the treatment of bimalleolar ankle fractures. Distal tibiofibular syndesmosis disruption could be spontaneously reduced without trans-syndesmotoc screw fixation by early

2 634-18 (561-712)

Tel : (0652) 250-1760
Fax : (0652) 271-6538
E-mail : kysong@moak.chonbuk.ac.kr

*





open reduction and rigid internal fixation for the bimalleolar ankle fractures. Early and more accurate anatomical reduction can reduce the post-traumatic arthritis in cases with moderate talar displacement and open fractures.

Key Words : ankle bimalleolar fracture, anatomical reduction, rigid fixation

가 (mild), (mortise) 1/2 (severe) 가32 (90%), (moderate), 가3 (7.2%), 가1 (2.8%) 20 (56%)

2,6,13,15

가 Lauge-Hansen¹⁶⁾ Burwell Chamley⁹⁾ Meyer¹⁰⁾

1. 1991 3 1997 12 1 가 90 36 36 19) AO 가27 , 가9 16 75 44 tension-band wiring, tension-band wiring 가14 (38%) 가가 17 (47%) 가 15 (41%), 2 (5.5%) , 33 (93%), 3 (7%) . Lauge-Hansen¹⁶⁾ 4 (Table 1). 가 - 9 (25%), - , 4 가 6 (17%), - 4 (11%) , 4



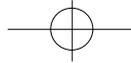


Table 1. Methods of fixation of the bimalleolar fracture.

Implants/site	Medial malleolus	Lateral malleolus	Distal tibiofibular joint	Total
Screw	32	7		39
K-wire	2	0		2
Tension band wiring	2	10		12
Transfixation screw			4	4
Plate and screw		19		19
Total	36	36	4	76

8

12

10,12)

Lauge-Hansen¹⁶⁾

Meyer¹⁰⁾

(Table 2).

32

(89%)

(Excellent or Good)

-
2,4,6,8,16)

가

32 (89%)

가

17 (47%) 가

가

4

2 ,

가

2

2 가

2 ,

2,3,6,14,21)

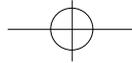
. Brodies Denham⁸⁾, Meyer

Kumler¹⁸⁾

가

Table 2. Criteria used in assessment of result (Meyer)

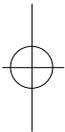
Result	Clinical	Radiological
Excellent	No pain, full range of motion	Normal X-ray
Good	Pain after strenuous activity, less than 15 ° of motion lost	Calcification of interosseous ligament or deltoid ligament
Fair	Pain with normal activity, 15-30 ° motion lost	Malunion or nonunion
Poor	Consistant pain, Over 30 ° motion lost or ankle arthrodesis	Joint narrowing or marginal osteophytes

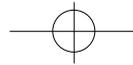


가
 2
 Meyer Kumler¹⁸⁾ Yablon Heller²³⁾, Wilson
 Skilbred²²⁾ 가
 Yablon²³⁾ 가
 , tension-band wiring 가
 24,11) ,
 가
 tension-band wiring 가
 (diastasis) 가
 Cedel¹⁰⁾ Hughes¹³⁾ 가
 , Nielson 가
 20) C
 1,5,17) 가 Heim Pfeitter¹¹⁾

REFERENCES

- 1) , , :
 , 23: 38-48, 1988.
- 2) , , , :
 , 20: 131-140, 1985.
- 3) , :
 , 19: 839-848, 1984.
- 4) , , , :
 , 5: 227-235, 1992.
- 5) , , : Weber C





- 26: 152-157, 1991.
- 6) , , , , : , 24: 701-707, 1989.
- 7) **Breederveld RS, van Straaten J, Patka P and van Monrik JC** : Immediate or delayed operative treatment of fracture of the ankle. *Injury*, 19: 436, 1988.
- 8) **Brodie IAO and Denham RA** : The treatment of unstable ankle fracture. *J Bone and Joint Surg*, 56-B: 256-262, 1974.
- 9) **Burwell HN and Charnley AD** : The treatment of displaced fractures at the ankle by rigid internal fixation and early joint movement. *J Bone and Joint Surg*, 47-B: 634-660, 1965.
- 10) **Cedell CA** : Ankle lesions. *Acta Orthop Scand*, 46: 425-445, 1975.
- 11) **Heim U and Pfeitter KM** : Internal fixation of small fractures. 3rd ed. P. 290, Springer-Verlag, Berlin, Heide berg, *New York*, 1988.
- 12) **Heppenstall RB** : Fracture treatment and healing. 1st ed, P. 803-838, Philadelphia, *WB Saunders*, 1980.
- 13) **Hughes JL, Weber M, Willenger H and Kenner EH** : Evaluation of ankle fractures. *Clin Orthop*, 138: 111-119, 1979.
- 14) **Joy G, Patzakes MJ and harvey JP** : Precise evaluation of the reduction of the severe ankle fracture. *J Bone and Joint Surg*, 56-A: 979-993, 1974.
- 15) **Konvath G, Karges D and Watson JT** : Early versus delayed treatment of severe ankle fracture: a comparison of results. *J Orthop Trauma*, 9: 377, 1995.
- 16) **Lauge-Hansen N** : FRactures of the ankle II. Combined experimental surgical and experimental roentgenographic investigation. *Arch Surg*, 60: 957-985, 1950.
- 17) **Mast JW and Teipmer WA** : A reproducible approach to the internal fixation of ankle fractures: Rationale, technique and early results. *Ortho Clin N Am*, 11: 661-679, 1980.
- 18) **Meyer TL and Kumler KW** : ASIF technique and ankle fractures. *Clin Orthop*, 150: 211-221, 1980.
- 19) **Muller ME, Allogower M, Schneider R and Willenegger H** : Manual of internal fixation. 3rd Ed, Berlin, *Springer-Verlag*,: 595-612, 1991.
- 20) **Nielson PR, Chrisensen N and Greiff J** : The stability of the tibiofibular syndesmosis following rigid internal fixation for type C malleolar fractures: An experimental and clinical study. *The British J Accident Surg*, Vol. 14: 357, 1982.
- 21) **Ramsey PL and Hamilton W** : Changes in tibiofibular area of contact causes by lateral talr shift. *J Bone and joint Surg*, 58-A: 356-357, 1976.
- 22) **Wilson FC and Skillbred LA** : Long term results in the treatment of displaced bimalleolar fractures. *J Bone and Joint Surg*, 48-A: 1065-1078, 1966.
- 23) **Yablon IG, Heller FG and Shouse L** : The key role of the lateral malleolus in displaced fractures of the ankle. *J Bone and Joint Surg*, 59-A: 169-173, 1977.

