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= Abstract =

Assessment of the Stability of the Isolated Lateral Malleolar Fracture

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Recent advances in the understanding of the biomechanics of the ankle have given rise to the clinical uncertainty about the indications for the operative treatment of isolated fractures of the lateral malleolus. If deltoid ligament injury is associated, it may be unstable and operation may be indicated.

This study was done to determine if we are able to assess the stability of the isolated lateral malleolus fracture based on the fracture patterns seen on radiographs and clinical findings.

37 patients with malleolar fracture of the ankle were treated at Hanil General Hospital by open reduction and internal fixation from Dec. 1996 to Jan. 1998. Lauge-Hansen classification was tried in all cases to determine if it could be applied. Stress test under anesthesia on 10 isolated lateral malleolar fracture patients with clinical findings of injury on the deltoid ligament area, whose medial clear space were normal or widened less than 2 mm on initial film. Exploration of the deltoid ligament was performed in 6 of above 10 patients

There were 21 supination-external rotation type injuries, 2 supination-adduction injuries, 1 pronation-abduction injury and 13 fractures could not be clearly categorized into specific group. In 6 among 13 unclear cases, there were short oblique fracture line indicating pronation injury, but direction of the fracture line could not be clearly determined. In 4 cases, direction of the fracture line indicated pronation injury, but the length of the fracture line was too long. In 3

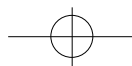
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cases, both the direction and length of the fracture line was indeterminate.

The stress test on 10 isolated lateral malleolar fractures with clinical findings of deltoid injury revealed less than 2 mm widening in 7 cases, more than 2 mm widening in 3 cases. In 3 cases with less than 2 mm widening, tearing of anterior third of superficial deltoid was confirmed by exploration. In 3 cases with more than 3 mm widening, partial rupture of the deep deltoid was observed in 2 cases and anterior third of superficial deltoid was torn in 1 case.

We suggest that we cannot clearly assess the stability of isolated lateral malleolar fracture either by fracture patterns or clinical findings, so stress test can be considered in determining the stability.

Key Words : Malleolar fracture, Isolated, Stability

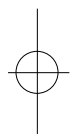
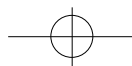


Table 1. Pankovich modification of Lauge-Hansen system

Type	Description of fibular fracture
Supination-external rotation fracture	Spiral and variable obliquity, extending from the anterior edge in a posterosuperior direction
Pronation-abduction fracture	Oblique and extends from the lateral surface in an inferomedial direction
Pronation-external rotation fracture	Short and oblique, and extends from the anterior edge in a posteroinferior direction



37 . 19 3 , 6
18
Leeds Ehrlich ¹³⁾
Lauge-Hansen Lauge-
Hansen ¹⁰⁻¹²⁾ Pankovich ^{20,21)}
(Table 1). Lauge-
Hansen
6-8cm Lauge-Hansen 37 -
21 , - 2 , - 1
Pankovich 가 13
(Table 2). 가 13
가 6
가 4
가 3 (Table 3, Fig 1-A,B,C).
10 2 3mm, 1
4mm가 7 2mm
(Fig 2-A,B). 3mm 3
2
가 1
1/3 . 2mm
7 3
1/3
10 2mm 3 3mm

Table 2. The results of the Lauge-Hansen classification

Type	No. of the case
Supination-external rotation	21
Supination-adduction	2
Pronation-abduction	1
Uncertain	13

Table 3. Patterns of 13 uncertain type fractures

	No. of the case
Short oblique fracture line indicates pronation injury, but direction of the fracture line cannot be clearly determined	6
Direction indicates pronation injury, but the length of the fracture line was too long	4
Indeterminate both in the direction and the length of the fracture line	3



Fig 1. Anteroposterior and lateral radiographs of the ankle, motise view is included in B.

- A. Short oblique fracture line indicates pronation injury, but direction of the fracture line cannot be clearly determined.
- B. Direction of fracture indicates pronation injury, but the length of the fracture line was too long.
- C. Indeterminate both in the direction and the length of the fracture line.

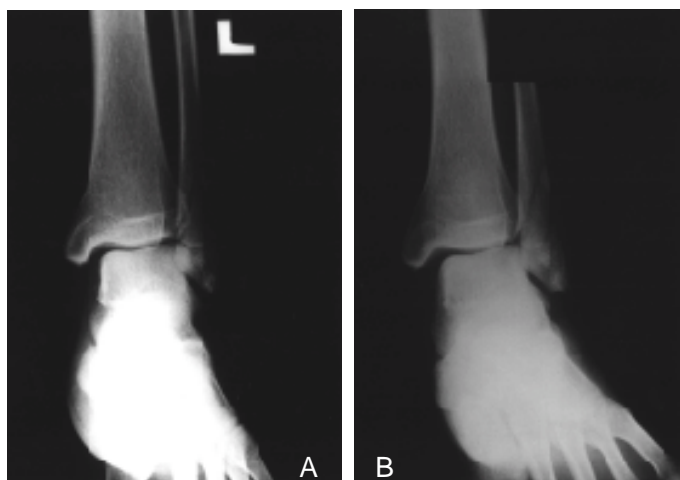


Fig 2. Anteroposterior view of the ankle.

- A. 2 mm widening of the medial joint space in the initial radiograph.
- B. Medial clear space widening was increased to 4 mm in the stress view.



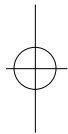
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3mm 37 13
 3 2 Lauge-Hansen
 가
 2mm
 10 7 2mm
 anterior talotibial fibers, cacaneotibial 3
 fibers, deep posterior talotibial fibers 1/3
 가 8).
 가 1/3
 가
 가

Lauge-Hansen

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