

# LAG SCREWS FIXATION VERSUS BUTTRESS PLATE IN VERTICAL SHEAR MEDIAL MALLEOLAR ANKLE FRACTURES

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## Introduction

Ankle fractures are common injuries that could result from a trivial twisting injury in old frail patients up to high energy trauma in a young population. Ankle fractures represent 10 % of all fractures making these the second most common lower limb fractures after hip fractures. Open reduction and internal fixation is the management of choice for bimalleolar ankle fractures. Lateral malleolus fractures are fixed by either by plate or long cortical screw. The debate is ongoing about the best fixation method for vertical shear medial malleolus fracture either by lag screws or buttress plate as they are biomechanically different in their strength of fixation. Lag screws offers good advantage of smaller incision and less prominent metal work. Buttress plate offers good advantage of more mechanical stable rigid fixation.

## Aim of the work

The aim of this study was to compare between the results of lag screws fixation versus buttress plate in vertical shear medial malleolar ankle fractures.

## Patients and Methods

We prospectively compared the results of open reduction and internal fixation of vertical medial malleolus fracture by lag screws versus buttress plate of 30 patients.

- The age of the patients in this study ranged from 20-60 years old.
- The patients will be simply randomized into two groups using a random number generator.

**Group A:** will undergo open reduction and internal fixation of vertical medial malleolus fracture using lag screws only.

**Group B:** will undergo open reduction and internal fixation of vertical medial malleolus fracture using buttress plate.

-All patients were assessed radiologically at 2, 4 and 6 weeks to evaluate any loss of reduction. AOFAS score is used at 6 months to evaluate functional outcome of the ankle joint.

## Results

**1-Total score:** According to Chi- square test, no statistical significance between the two groups as regard the functional outcome.

**Table 1:** Comparison between the two studied groups according to AOFAS total

AOFAS total	Group A (n = 15)		Group B (n = 15)		Test of sig.	p
	No.	%	No.	%		
Excellent	1	6.7	2	13.3	$\chi^2=$ 2.168	<sup>MC</sup> p= 0.690
Good	7	46.7	8	53.3		
Fair	5	33.3	5	33.3		
Poor	2	13.3	0	0.0		
Min. – Max.	44.0 – 95.0		62.0 – 97.0		t=1.332	0.194
Mean ± SD.	73.13 ± 14.87		79.40 ± 10.53			
Median (IQR)	75.0 (64.0 – 83.50)		77.0 (73.0 – 87.0)			

IQR: Inter quartile range      SD: Standard deviation      t: Student t-test  $\chi^2$ : Chi square test  
MC: Monte Carlo      p: p value for comparing between the two studied groups

**2- Complications:** Complication rate was higher in group B by 33 % compared to 26 % in group A .Non united MM was found in 2 cases in group A. Implant failure was found in 1 case in group A. Palpable hardware was found in 2 cases in group A and 3 cases in group B.

**Table 2:** Comparison between the two studied groups according to complication

Complication	Group A (n = 15)		Group B (n = 15)		$\chi$	$^{FE}p$
	No.	%	No.	%		
No	11	73.3	10	66.7	0.159	1.000
Yes	4	26.7	5	33.3		
Non union MM	2	13.3	0	0.0	2.143	0.483
Non union LM	1	6.7	0	0.0	1.034	1.000
Lost reduction MM	2	13.3	0	0.0	2.143	0.483
Lost reduction LM	0	0.0	0	0.0	–	–
Implant failure	1	6.7	0	0.0	1.034	1.000
Palpable hardware	2	13.3	3	20.0	0.240	1.000
Delayed wound healing	0	0.0	2	13.3	2.143	0.483
Nerve injury	0	0.0	0	0.0	–	–
Re-intervention	2	13.3	0	0.0	2.143	0.483

$\chi^2$ : Chi square test      p: p value for comparing between the two studied groups

**3-Medial malleolus union:** Radiological union evidenced by bone trabecula obliterating the fracture site in plain x-rays (standard AP, mortise and lateral views) was detected in 86.7 % of cases in group A compared to 100 % in group B. According to Chi- square test, no statistical significance between the two groups as regard the union rate.

**Table 3:** Comparison between the two studied groups according to union

Union	Group A (n = 15)		Group B (n = 15)		$\chi^2$	$^{FE}p$
	No.	%	No.	%		
Non united	2	13.3	0	0.0	2.143	0.483
United	13	86.7	15	100.0		

$\chi^2$ : Chi square test  
FE: Fisher Exact  
p: p value for comparing between the two studied groups

## Conclusion

There was no statistically significant difference between buttress plate fixation and screw-only fixation in terms of functional outcome and stability..