Full Weight-Bearing after Dual-Fixation of Clavicle Fractures Appears Safe and Effective: A Multicenter Comparative Study

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INTRODUCTION:

Recently, dual-plating of displaced clavicle fractures has become a popular construct to reduce implant prominence while optimizing balanced fixation. Traditionally patients have a limited weight-bearing period after clavicle fracture fixation. However, dual-plate fixation may allow for immediate weight-bearing and facilitate earlier rehabilitation, especially in polytraumatized patients. This study aims to evaluate healing and complication rates between different weight-bearing protocols following dual-plating of displaced diaphyseal clavicle fractures.

METHODS:

There were 69 patients from two separate level 1 trauma centers who sustained a diaphyseal clavicle fracture and were subsequently treated with dual-plate fixation from 2014 to 2022. Patients were included with minimum of one-year follow up or until radiographic and clinical union. Patients were either non-weight-bearing (NWB) (n = 11), Partial-weight-bearing (PWB) (n = 36), or weight-bearing-as-tolerated (WBAT) (n = 22) based on surgeon preference. Complications, reoperation rates secondary to loss of reduction/fixation, and union rates were compared between weight-bearing groups using Fisher's exact test.

RESULTS:

Baseline sociodemographic groups were similar between weight-bearing groups (**Fig. 1A**). There was no significant difference in union rates (NWB 100%, PWB 97.2%, WBAT 95.45%) (**Fig. 1B**). There was no significant difference in overall reoperation rate between weight-bearing groups (**Fig. 1B**). The majority of reoperations were due to symptomatic hardware removal. One patient in the PWB group required revision surgery for explicit nonunion. One patient in the WBAT group required I&D for superficial wound infection. **(Fig. 1C)**

DISCUSSION AND CONCLUSION:

Patients treated with dual-plate fixation had well-balanced and stable fixation constructs. Full weight-bearing after dual-plate fixation for displaced diaphyseal clavicle fractures may be safe and effective. In comparison, limited weight-bearing does not seem to offer any clinical benefit related to union and complication rates. Allowing patients to weight bear immediately after clavicle fracture fixation may improve rehabilitation especially in polytraumatized patients who require crutch/walker weight-bearing for concomitant injuries.

Fig 1A Sociodemographics

Variable	WBAT	PWB	NWB	P value
Total (n)	22	36	11	
Age (Mean ± SD)	41.68 ± 17.28	41.39 ±13.56	39.09 ± 11.61	P = 0.88
Gender (Male %)	72.7%	80.6%	91.0%	P = 0.46
BMI (Mean ± SD)	25.32 ± 7.09	24.52 ± 2.68	23.55 ± 2.42	P = 0.57
ASA (Mean ± SD)	2.54 ± 0.86	1.19 ± 0.40	1.18 ± 0.40	P < 0.0001
Smoking history (Yes %)	31.8%	11.1%	18.2%	P = 0.13

Fig 1B Primary Outcomes

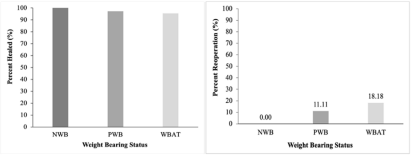

Fig 1C Complications

Variable	WBAT	PWB	NWB	P Value
Healed? (% Achieving Bony Union)	95.45%	97.2%	100%	0.99
Complications (n)				
Loss of Reduction/Fixation Requiring Reoperation TOTAL	4	4	0	0.30
Neurovascularly Compromised	1	0	0	
Infection Requiring I&D	1	0	0	
Removal of Symptomatic Implants	2	2	0	
Heterotopic Ossification	0	1	0	
Nonunion	0	1	0	