

Locking Plate Fixation of Bicondylar Tibial Plateau Fractures Raises Treatment Costs Without Clinical Benefit

*Matthew Cavallero, MD; Rich Rosales, BS; Jesse Caballero, BS; Walter W. Virkus, MD; Laurence B. Kempton, MD; Todd O. McKinley, MD; Greg E. Gaski, MD
Indiana University School of Medicine, Indiana, USA*

Purpose: Lateral locking plates are popular for the treatment of bicondylar tibial plateau (BTP) fractures. Studies have shown variable results when comparing lateral locked plating to conventional nonlocked dual plating for BTP. There is limited data on the value (outcome:cost ratio) of implant options. We hypothesized that lateral locked plating would increase cost without affecting clinical outcomes in comparison to nonlocked dual plating of BTP.

Method: We reviewed all BTP fractures (OTA 41-C) age >17 treated by 6 fellowship-trained surgeons from 2013-2015 with followup >12 months. Charts were reviewed for demographic, clinical, and radiographic data. Functional outcomes were assessed via PROMIS scores (Physical Function [PF] and Pain Interference [PI] domains). Implant costs were calculated using intraoperative inventory software and accuracy was confirmed with radiograph review. Outcomes and costs were compared between patients with nonlocking (NL) versus locking (L) implants.

Results: 59 patients were included (30 NL, 29 L). Mean follow-up was 24.3 months (range, 12-41). The groups had similar demographic profiles and fracture characteristics (95% OTA 41-C3) (Table 1). We observed a 70% higher cost of implants in the L group. (Table 1) No differences in clinical or radiographic outcomes were found (Table 1). Analysis of the L group showed no difference in outcome among patients that had adjunctive medial fixation.

Conclusion: This investigation found no clinical benefit to the use of locking implants in BTP fractures, despite a significantly larger cost incurred.

	Number	Locking group	Nonlocking group	P-value
		29	30	
Demographics	Age (mean)	51	48	0.39
	Sex (M:F)	17:12	20:10	0.60
	BMI (mean)	30	30	0.58
	Smoker (%)	52	33	0.19
	Diabetes (%)	21	17	0.75
	Osteoporosis (%)	7	6	0.61
Fracture Characteristics	OTA Class 41-C1/2 (%)	0	10	0.24
	OTA Class 41-C3 (%)	100	90	
	Open Fracture (%)	10	3	0.61
	Adjunct Medial Plate (%)	62	87	0.04
Clinical and Radiographic Outcomes	Reoperation (%)	38	20	0.16
	Nonunion (%)	10	7	0.67
	Deep Infection (%)	21	10	0.30
	Change in Alignment >5 deg (%)	7	10	1
	PROMIS Physical Function	39	42	0.20
	PROMIS Pain Interference	60	56	0.18
	Mean Cost (Std Dev)		\$ 5443 (2567)	\$ 3194 (1470)

Table 1. Significantly higher costs were incurred in the locking implant group compared to the nonlocking group. There were no differences observed between the groups with respect to demographics, fracture characteristics, clinical, and radiographic outcomes.

The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.