

Plate-Assisted Intramedullary Nailing of Gustilo Type 3B Open Tibial Diaphyseal Fractures: Does Retained Adjunct Plate Fixation Affect Complication Rate?

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Purpose: Open tibial fractures can present both bony and soft-tissue challenges. A 2-stage orthoplastic approach, using a small fragment plate as temporary internal fixation, encourages adequate exposure of the zone of injury at first debridement. If replaced with a fresh implant at the second stage, the plate can also be used for “plate-assisted nailing” and retained as part of the definitive fixation. We aimed to determine if this retained adjunct plate fixation (RAPF) was associated with an increase in infection and nonunion rates.

Methods: This was a retrospective comparative cohort study of 113 patients, over a 4-year period in a Level-I trauma center. The primary outcome measures were deep infection and nonunion rates. The secondary outcomes were flap failure and overall complications. A binary logistic model was utilized for primary and secondary outcomes. Significance was set at $P < 0.05$.

Results: Median age was 42.9 years (interquartile range [IQR] 37) with a median follow-up of 1.7 years (IQR 0.9). 79 patients had RAPF as part of their reconstruction. Eight patients (8/113, 7.1%) developed a deep infection (RAPF 6/79, non-RAPF 2/34) ($P = 0.548$). Six patients (6/113, 5.3%) proceeded to nonunion (RAPF 5/79, non-RAPF 1/34). This was not significant ($P = 0.413$). There was no significant difference in secondary outcomes between groups (Table 1).

Conclusion: In the context of an orthoplastic set-up, use of retained adjunct plate fixation with definitive intramedullary nailing does not increase the rate of deep infection or nonunion in patients with type 3B open tibial shaft fractures.

Table 1 – Retained adjunct plate fixation vs removed and complications

Complication	Total n (%)	RAPF n (%)	Non-RAPF n (%)	<i>P</i>	Adjusted Odds Ratio (95% CI)
Deep Infection	8 (7.1)	6 (7.6)	2 (5.9)	0.548*	1.32 (0.252 – 6.87)
Non-union	6 (5.3)	5 (6.3)	1 (2.1)	0.413*	2.23 (0.251 – 19.84)
Infected Flap Failure	4 (3.5)	3 (3.8)	1 (2.1)	0.651*	1.30 (0.131 – 12.99)
Isolated Flap Failure	1 (0.9)	1 (1.3)	0 (0)	0.699*	0.86 (0)
All Complications	11 (9.7)	8 (10.1)	3 (8.8)	0.567*	1.16 (0.289 – 4.69)

*not statistically significant

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.