

Soft-Tissue Management in Open Tibial Shaft Fractures: A Comparison of Institutional Protocols

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Purpose: Our objective was to compare the results of institutional protocols at 2 high-volume trauma centers with regard to the treatment of soft tissues in the setting of open tibial shaft fractures.

Methods: This is a retrospective review at 2 high-volume Level-I trauma centers of all open tibial shaft fractures (OTA 42) identified using a prospectively and retrospectively collected fracture database over a 6-year period.

Providers at Site 1 advocate for attempted acute primary closure while those at Site 2 encourage repeat debridement and delayed coverage for wounds not easily closed. Patient demographics, injury, and treatment characteristics were recorded. Primary outcome was 90-day wound complications including superficial infection, deep infection, and wound dehiscence. Secondary outcomes included reoperation, infection, nonunion, and amputation rates.

Results: 219 patients were included at Site 1 and 282 at Site 2. Cohorts were similar with regard to patient demographics and comorbidities. Site 1 closed significantly more traumatic wounds at index surgery (78% vs 36%, $P < 0.05$) and required a mean of 1.6 procedures for definitive closure compared to 3.5 at Site 2 ($P < 0.05$). No differences were seen in complication, reoperation, nonunion, or amputation rates (Table 1).

Conclusion: Attempted acute closure of open tibial shaft fractures results in a lower number of planned secondary procedures, although conclusions may be limited by injury characteristics not accounted for. No difference was seen in 90-day wound complications, return to operating room, nonunion rates, and need for amputation between Sites 1 and 2. Providers should consider either acute closure or delayed coverage based on comfort level and institutional preferences without concern that the decision at the time of index surgery will lead to an increased risk of complication.

| | Site 1 | Site 2 | p-value |
|---|--------|--------|------------|
| % Closed at index surgery | 78% | 36% | $p < 0.05$ |
| Mean number of procedures for closure | 1.6 | 3.5 | $p < 0.05$ |
| % Closed without coverage (flap, STSG) | 82% | 38% | $p < 0.05$ |
| % 90-day wound complications | 8.7% | 7.9% | $p = 0.87$ |
| % Returned to OR for wound complication | 8.1% | 7.9% | $p = 0.59$ |
| % Non-unions (of total patient number) | 9.1% | 7.1% | $p = 0.40$ |
| % Amputation | 8.8% | 8.5% | $p = 1.0$ |

Table 1: Comparison of clinical outcomes between Site 1 and Site 2