

Early Definitive Care Is as Effective as Staged Treatment Protocols for Open Ankle Fractures from Rotational Mechanisms: A Retrospective Cohort Study

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Purpose: This study was conducted to compare immediate internal fixation with primary wound closure versus temporary stabilization with delayed fixation and wound closure protocols for management of open ankle fractures from rotational mechanisms.

Methods: A total of 88 consecutive Gustilo-Anderson (GA) type I (7), II (23), and IIIa (58) open ankle fractures from rotational mechanisms were retrospectively analyzed at a single institution. Patients were divided into an immediate internal fixation with primary wound closure (EARLY) cohort and a temporary stabilization with delayed fixation and wound closure (STAGED) cohort. The decision to perform EARLY versus STAGED treatment was dependent on the staff surgeon as 1 surgeon performed definitive treatment EARLY while all other surgeons opted for the STAGED protocol. We compared demographics, radiographic classification, and outcome measures including infection, length of stay, number of operations. Clinical measures included pain levels out of 10 at all clinic visits. Radiographs were also taken at every clinical visit and we rated joint changes as none, degenerative changes present, or severe degenerative changes consistent with posttraumatic osteoarthritis. Ambulation was recorded and divided into limited or unlimited.

Results: 40 patients were treated with the EARLY protocol (45%) and 48 patients (55%) were STAGED. Groups were comparable with regard to age, gender, comorbidities, ASA (American Society of Anesthesiologists) classification, fracture type, mechanism of injury, GA classification, and time to initial operation. Mean length of follow-up was 14.0 ± 16.6 months (range, 6-78 months) for the EARLY cohort and 16.6 ± 22.9 months (range, 6-105) for the STAGED cohort ($P = 0.57$). Overall, 6 patients were diagnosed with infection, corresponding to an incidence of 6.8%. There were 2/40 cases in the EARLY cohort (5%) and 4/48 in the STAGED cohort (8.3%). No significant difference was found between these cohorts ($P = 0.68$). Mean number of reoperations was significantly greater in the STAGED cohort (121; mean 2.5 ± 2.90 ; range, 0-13) as compared to the EARLY cohort (25; mean 0.6 ± 1 ; range, 0-4) ($P < 0.0001$). The STAGED cohort had a significantly longer length of hospital stay (10.6 ± 7.1 days; range, 3-35) versus the EARLY cohort (6.4 ± 4.7 days; range, 2-25) ($P = 0.0003$). Clinical outcomes were compared for patients (52) with greater than 12 months of follow-up. Categories included pain, ambulation, or osteoarthritis. There were no significant differences between cohorts for pain ambulation or osteoarthritis. However 30% of patients ranked their pain $>4/10$, 60% of patients felt that they had some limitation in ambulation, and 37% of patients had evidence of osteoarthritis at their latest follow-up.

Conclusion: Our study showed that early definitive treatment compared to a staged protocol for GA type I, II, and IIIa open ankle fractures from rotational mechanisms has similar rates of infection, shorter hospital stay, fewer surgical interventions, and similar clinical outcomes.