

**Redislocation After Splinting for Ankle Fracture-Dislocation:
Is a Temporizing External Fixator a Better Care Plan?**

*Richard Wawrose, MD; Leonid Grossman, MD; Matthew Tagliaferro, PA-C;
Gele Moloney, MD; Ivan Seth Tarkin, MD
University of Pittsburgh Medical Center, Pittsburgh, PA, United States*

Purpose: Temporizing management of ankle fractures has traditionally been closed reduction and splintage. Unstable ankle fracture-dislocations, however, may have an increased propensity for loss of reduction/redislocation causing further chondral damage and/or soft-tissue complication. The purpose of this study was to determine the rate of complications with the traditional care paradigm consisting of closed reduction and splinting of unstable ankle fracture-dislocations. Further, we determined the efficacy of immediate external fixation as an alternative to splinting in cases too swollen for acute operation.

Methods: This retrospective chart review analyzed all ankle fracture-dislocations that came through a large health care system (2 Level-I trauma centers and 3 community hospitals) from 2008-2018. Ankle fracture-dislocation was defined as >50% subluxation of the talus in relation to the tibia. Patients managed with acute open reduction and internal fixation (ORIF) and open fractures were excluded. In patients with delayed management, patient cohorts were divided into those temporized with closed reduction/splinting versus external fixation. Rate of complications was analyzed including loss of reduction and soft-tissue compromise. Two-tailed Fisher exact test was used to compare rates of redislocation and rates of development of skin necrosis with significance set at $P < 0.05$.

Results: 354 closed ankle fracture-dislocations were identified. 298 patients (84%) underwent ORIF within 48 hours and were excluded. 28 (15F/13M, average age 46.8 years) were placed in an external fixator and 28 (22F/6M, average age 57.2 years) were reduced, splinted, and discharged. The external fixator cohort was composed of 23 44B-3 and 5 44C-2 fractures, and the splint cohort was composed of 24 44B-3 and 4 44B-2 fractures. At follow-up, 14 of the patients (50%) in the splint group developed loss of reduction and 5 of these patients (17.6%) developed anteromedial skin necrosis from skin tenting. Patients in this subgroup experienced an average delay to definitive surgery of 27 days. None of the patients in the external fixator cohort developed loss of reduction or skin necrosis. One patient (3.6%) in the external fixator cohort developed pin-site infection requiring intravenous antibiotics. The rate of redislocation and the rate of development of skin necrosis was significantly higher in cases temporized with a splint versus an external fixator ($P < 0.01$ and $P = 0.05$, respectively).

Conclusion: In ankle fracture-dislocations not treated with acute ORIF, splint immobilization is associated with an increased rate of complications, including redislocation and skin necrosis, when compared to a temporizing external fixator.