Open Ankle Fractures and Early Fixation: Are They Safe to Fix? A 10-Year Review of Isolated Open Ankle Injuries

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Background/Purpose: Little data exist to support immediate fixation of isolated open ankle fractures; one study of 95 patients with this injury demonstrated a similar complication rate (3%) to management of closed ankle injuries. Given limited evidence, surgeons often base their decision to acutely fix open ankle fractures on data surrounding closed injuries that have a quoted complication rate of 3.6%, when fixed early. This study sought to explore the complication rate of early fixation of open ankle injuries at a single Level I center. In a future health-care system that will potentially penalize complications, it is critical that orthopaedic trauma surgeons have a better understanding of the pitfalls in the acute management of these injuries and if indeed complication rates are similar to management of closed injuries.

Methods: An ankle fracture database was created by using CPT codes related to ankle fractures and identified 1469 patients between 2001 and 2011. From this database we identified 72 isolated open ankles in skeletally mature patients by confirming through radiographs and operative notes via the electronic medical record. From this information we performed a retrospective review of our open ankle fractures to determine rates of complications that included deep infection, hardware removal for pain, nonunion, and arthrodesis. Information was also gathered regarding numbers of surgeries and timing of definitive fixation. χ^2 analysis between open fracture types was performed.

Results: A total of 72 isolated open ankle fractures (Gustilo type I, n = 11 [15.27%]; type II, n = 34 [47.22%]; type III, n = 27 [37.5%]) were treated with operative fixation during their initial hospital admission. The overall complication rate was found to be 29.17% (n = 21). The most common complication was deep infection at 20.83% (n = 15). Other complications included hardware removal for pain (n = 3), nonunion (n = 3), fusion (n = 4), and 2 amputations. There was no significant difference in complication rates between fracture grades ($P > 0.05$). A subanalysis of fractures fixed within 24 hours (n = 54) showed a deep infection rate of 18.5% (n = 10).

Table 1. Complications based on Gustilo Type

Type	Infection	Hardware Pain	Nonunion
I (n = 11)	9.1% (1/11)	9.1% (1/11)	0.0% (0/11)
II (n = 34)	17.6% (6/34)	5.9% (2/34)	5.9% (2/34)
III (n = 27)	29.6% (8/27)	3.7% (1/27)	7.4% (2/27)
Overall (n = 72)	20.8% (15/72)	5.6% (4/72)	5.6% (4/72)
p	$P = 0.40$	$P = 0.77$	$P = 0.18$

See pages 99 - 147 for financial disclosure information.

Conclusion: Our data demonstrates an overall 29.17% complication rate in the acute management of open ankle fractures that is driven mostly by infections and wound complications. In fact, our data demonstrate striking similarity to the complication rates in acute fixation of pilon fractures. This study suggests that debridement and external fixation or splinting are warranted in the early management of open ankle fractures.

- The FDA has not cleared this drug and/or medical device for the use described in this presentation (i.e., the drug or medical device is being discussed for an "off label" use). For full information, refer to page 600.