

Impact of Management on Reoperation Rates in Gustillo-Anderson Grade III Open Fractures of the Lower Limb

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Purpose: The British Orthopaedic Association (BOA) and the British Association of Plastic, Reconstructive and Aesthetic Surgeons (BAPRAS) have produced standards of care for severe lower limb injuries since 1997 and National Institute for Health and Care Excellence (NICE) guidance was released in 2016. These place emphasis on a combined orthoplastic approach to ensure best outcomes for patients. Our aim is to assess the effect of single-stage versus multistage definitive orthoplastic reconstruction on reoperation rates secondary to infection or nonunion.

Method: A retrospective review of patients presenting to a major trauma center in the UK with an open lower limb fracture. All patients with Gustilo-Anderson (G-A) III injuries of the lower limb between April 2013 and March 2015 were included. Exclusion criteria applied were death and incomplete follow-up data.

Results: Eighty-seven patients with 87 fractures were identified. The tibia and fibula were involved in 87% and 56% sustained a G-A IIIb injury. Procedures were classified as single-stage orthopaedic, single-stage orthoplastic, and multistage orthoplastic. Single-stage orthoplastic procedures were performed in 47%. Reoperation due to either deep infection or nonunion was required in 16%. G-A IIIa injuries treated with a single-stage orthopaedic approach were most likely to require reoperation within 1 year (24%). Considering all G-A III injuries, those treated by a single-stage orthoplastic approach had a significantly reduced reoperation rate of 7%, compared to a multistage approach reoperation rate of 30% ($P = 0.028$). Patients who received definitive fracture fixation and soft-tissue cover between 72 hours and 7 days had the lowest reoperation rate, 6.3%. The rate was higher in those waiting less than 72 hours and more than 7 days, 15% and 33%, respectively.

Conclusion: We have found that a single-stage orthoplastic approach to the management of open lower limb fractures affords the best outcome for our patients in terms of reduction in reoperation rates. Traditionally, emphasis has been placed on timing of the procedure; however, we believe that more weight should be placed on combined orthoplastic management of these injuries. There may be an advantage in delaying definitive stabilization and soft-tissue reconstruction beyond 72 hours following the injury. This may be due to the soft tissue declaring itself following the trauma. As management of these injuries evolves, the importance of a combined orthoplastic approach to long-term outcomes is becoming more and more evident.