A Combined Orthoplastic Approach Reduces Infection in Lower Limb Open Fractures: A 5-Year UK Major Trauma Centre Experience

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Purpose: Open lower limb fractures are devastating injuries causing significant morbidity and loss of function. A growing body of evidence supports a combined orthopaedic and plastic surgery ("orthoplastic") approach providing early, definitive soft-tissue coverage and fracture fixation. This study aims to evaluate the outcomes of patients with lower limb open fractures treated with orthoplastic principles.

Methods: We present a retrospective review of all adult patients (>16 years) who sustained an open lower limb fracture at a UK Level I trauma center. Data were collected on patient demographics, injury characteristics, timing, and management strategy alongside clinical outcomes. All patients had a minimum follow-up of 12 months. Outcomes included infection, fracture union, limb salvage, and return to theater.

Results: A total of 398 patients with 435 fractures were included in this study. The majority of patients were male (282, 64.8%) with a median age of 45 years. There were 198 Gustilo-Anderson (GA) IIIb fractures, 135 grade IIIa, 60 grade II, 28 grade I, and 14 grade IIIc fractures. The median OTA OFC (Open Fracture Classification) score was 6. Before the first debridement, all injuries underwent multidisciplinary assessment by a senior orthopaedic and plastic surgeon. When soft-tissue reconstruction was required, 396 (99.5%) received fixation and soft-tissue overage in the same surgery as a "fix and flap" procedure. The median time to the first debridement was 24 hours. 74.3% of patients had definitive fixation and coverage within 72 hours of their injury. Of those patients requiring a soft-tissue reconstructive procedure, over half (52.8%) received a free tissue transfer, and a further 60 injuries were treated with a transposition flap. Across the study population, 98 injuries (22.5%) developed a complication requiring an unplanned return to theater or in-hospital treatment. The overall infection rate was 7.4%, and 10.6% of patients developed a nonunion of their fracture. Failure of soft-tissue coverage occurred in 36 patients (8.2%). Limb salvage was achieved in 92.6% of patients, and only 7 injuries (1.6%) required a delayed, secondary amputation.

Conclusion: These results demonstrate the effectiveness of a combined orthoplastic approach to open lower limb injuries. Timely, definitive soft-tissue coverage and fracture fixation as a joint procedure has led to substantially lower infection rates than reported in the existing literature. We advocate that this strategy should be adopted in trauma centers worldwide to drive continued improvement in care of open lower limb fractures.