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“Establishing a Limb Salvage Protocol at a Level 1 Trauma Center”

Lower extremity mangled injuries are devastating, life-altering events that incur significant costs to the healthcare system. There are advantages and disadvantages to both limb salvage and amputation, and the factors that impact the decision-making involve a complex interplay of patient characteristics, zone of injury, concomitant life-threatening insults, and the availability of plastic and reconstructive surgeons specializing in extremity reconstruction.

At our level 1 trauma center, extremity trauma is managed by a combination of Orthopedic, General Surgery Trauma, and Plastic Surgeons. From 2016-2024, 475 Gustilo 3 open fractures involving the lower extremities were admitted. 414 (87%) limbs were salvaged: 209 (50.5%) Gustilo IIIA, 137 (33.1%) Gustilo IIIB, and 68 (16.4%) Gustilo IIIC. 61 limbs underwent amputation, with 37 performed immediately (within 48 hours of injury) and 27 performed in a delayed fashion (after 48 hours). Factors associated with amputation included Gustilo IIIC injuries (OR 5.61, $p < 0.0001$), shock on presentation (OR 3.09, $p < 0.0005$), and consultation of plastic surgery (OR 2.32, $p < 0.0049$).

Large zone of injury and extensive soft tissue loss involving nerves, muscles, and tendons significantly impacted the decision for amputation. The involvement of plastic surgery played a role in both limb salvage and amputation due to the ability to assess potential for functional recovery. We believe that plastic surgeons should be involved early in the patient with complex extremity injury to help with assessment of tissue loss, evaluating reconstructive options, and surgical planning.