

A One-Stage Orthoplastic Approach in the Treatment of Gustilo III Open Fractures of the Lower Limb

*Veronica Scamacca, MD; Luigi Murena, MD; Stefano Gulli, MD; Zoran Arnez
Orthopaedic and Traumatology Clinic of Trieste, Trieste, Italy*

Purpose: The orthoplastic approach in the treatment of Gustilo III open fractures consists of the management of both bone and soft tissue in a simultaneous, coordinated, and organized manner. All of this is done in accordance with the 2015 BOA (British Orthopaedic Association)/BAPRAS (British Association of Plastic, Reconstructive and Aesthetic Surgeons) guidelines. The purpose of this treatment is to guarantee both the healing of the lesion as well as maintaining the limb's function, while avoiding infection, in order for patients to be able to return to daily life, work, and conduct a lifestyle that does not limit their social life.

Methods: We conducted a prospective / retrospective study through the collaboration of the Orthopedics and Traumatology Clinic and the Plastic and Reconstructive Surgery Clinic. Our study included 9 patients with 12 Gustilo III open fractures of the lower limb, treated between 2015 and 2018 with the orthoplastic 1-step approach. There were 3 tibial pilon fractures with severe soft-tissue damage and bone loss, treated with plate and screw and a free flap. Five of the fractures were diaphyseal tibial fractures with intramedullary nail and free flap placement. Two of the open fractures were supracondylar femur fractures with severe bone loss, treated with a vascularized double-barrel fibular autograft and plate and screw fixation. In some cases, bone grafts with concentrated bone marrow were used. Damage control was performed within 6 hours and the definitive orthoplastic treatment was completed after an average of 10.6 days. Recovery was an average of 44 days, 23 days in patients without associated severe injuries.

Results: We obtained the closure of soft tissue in an average of 27.7 days, with 1 complication 14.2% of partial flap necrosis. In the femur fractures, closure occurred in an average of 40.5 days for a complication in which an infection of a subfascial hematoma developed in a diabetic patient. We had to reintervene 16.6% of the time for soft-tissue complications and 33,3% for delayed consolidation. Radiological healing of bone was obtained in an average of 7 months in the diaphyseal tibial fractures, and full weight bearing at 5. In tibial pilon fractures, radiological healing and weight bearing was achieved in 15 and 6 months, respectively, and in femur fractures 9 and 4 months, respectively. Both clinical and functional results (Short Form [SF]-36, American Orthopaedic Foot & Ankle Society [AOFAS], Knee Society Score) are satisfactory. There were no secondary amputations and no bone infections.

Conclusion: Open fracture management continues to be a challenge for orthopaedic surgeons. Each of these injuries is different, with each segment having its own vascularization. Because of this difficulty, viable tissue must be treated through careful preoperative planning in each step, following the guidelines for patient management to achieve better results.