Segmental Tibial Fractures: 5-Year Prospective Clinical Analysis

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Purpose: Our objective is to analyze and determine characteristics, complications, and time to union of patients with segmental tibia fractures (TFs) in a Level I trauma center between 2017 and 2021.

Methods: In this prospective study, 46 patients with segmental TFs were selected between 2017 and 2021. Characteristics and complications were analyzed. Time to union was expressed in weeks and defined by consolidated fracture in radiographs.

Results: 510 patients sustained TFs; a total of 46 patients had a segmental TF (STF). The average age was 42.17 years old and 89.13% were male. There were 15 (32.6%) closed fractures and 31 (67.4%) open fractures, most of them Gustilo IIIA. AO fracture classifications were 29 (63%) AO42C2 versus 17 (37%) AO42C3. The prevalence of open fracture was 58.6% in the union group and 71.4% in the nonunion group. The complication rate was 17.2% in AO42C2 versus 29.4% in AO42C3 group. 33 (71.7%) required transitory external fixation and 17 were polytraumatized. 5 patients (10.86%) were treated with plates, 27 with Intramedullary nailing (58.69%), and 14 treated with intramedullary nailing and plate osteosynthesis (30.43%). Soft-tissue coverage was needed in 34 patients (73.1%). Complications were present in 10 patients (21.7%): 7 nonunion, 2 osteomyelitis, and 1 amputation due to necrotizing soft-tissue infection. Complications were associated to open fractures in 80%. Nonunion general rate was 15.21%. In the no-complications group, the general healing rate was 29.6 weeks, with difference between closed versus open fractures (26.3 vs 31.9 weeks, respectively) and according to AO classification 42C2 versus 42C3 (28.2 vs 33.8 weeks, respectively). The methods of definitive fixation were 5 plates and 41 intramedullary nails; 14 of these needed a metaphysodiaphyseal reduction plate.

Conclusion: STFs are high-energy injuries with a high rate of complications. Longer healing time is expected according to trauma energy, which included open fractures and those fractures with several comminutions that have the worst results.