

Complications and Outcomes Associated With Combat-Related Grade III Periarticular Tibia Fractures

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Abstract

Background: Open Periarticular tibia fractures with soft tissue loss, as a result of war trauma, are a significant reconstructive challenge. These fractures are frequently coupled with concomitant injuries and options for reconstruction may be limited. The purpose of this report is to present risk factors for complications and/or reoperations in patients with combat-related periarticular tibia fractures.

Methods: We analyzed retrospective and prospective data of all patients that sustained a periarticular tibia (plafond and plateau) fracture during Operation Enduring Freedom and Operation Iraqi Freedom from 2003 to 2011. Collated data included injury patterns, reconstruction methods, reoperation rates, complications, and outcomes. We performed a logistic regression analysis with amputation as our outcome variable against injury and treatment characteristics in order to determine significant predictors of delayed amputation.

Results: 146 patients sustained a combat-related periarticular tibia fracture during the time period observed. The mean patient age was 26.7 ± 6.8 years and the majority (86%) of the injuries were the result of a blast. 75% (111/146) received joint spanning external fixation prior to transport and most of these fractures were treated with ORIF (80%). Sixty-three percent (92/146) of the injuries were open fractures and classified according to the Gustilo-Andersen classification system.¹ There were 65 patients with Gustilo Grade I injuries; 20 with Grade IIIB injuries and 7 with Grade IIIC injuries. A soft tissue coverage procedure was required in 18 cases, of which 9 were flaps and 9 were free flaps. Seventy-nine percent (73/92) of these patients underwent reoperation for complications, most commonly due to post-traumatic osteoarthritis and/or infection. The overall infection rate was 21.9% (32/146), with 25% (23/92) of open fractures having associated infectious complications. Gram-negative bacteria were associated with 78% (18/23) of the open infections. Acinetobacter and E-Coli were the most frequent pathogens identified. Thirty-one percent (10/32) of patients with fractures complicated by infection underwent delayed limb amputation. Based on logistic regression analysis, patients having ipsilateral fractures, open fractures, and infections were found to contribute to significant increases in late amputation rates.

Conclusion: Open Periarticular tibia fractures suffered from combat-related trauma are associated with high complication rates and higher than expected delayed amputation rates.^{2,3} Based on our study, careful counseling and expectation management must be had in those trauma patients suffering open periarticular fractures undergoing attempts at limb salvage.

References

¹Gustilo RB, Anderson JT. Prevention of infection in the treatment of one thousand and twenty-five open fractures of long bones: retrospective and prospective analyses. J Bone Joint Surg Am. 1976 Jun;58(4):453-8.

²Hutson JJ Jr, Zych GA. Infections in periarticular fractures of the lower extremity treated with tensioned wire hybrid fixators. J Orthop Trauma. 1998 Mar-Apr;12(3):214-8.

³Sirkin M, Sanders R, DiPasquale T, Herscovici D Jr. A staged protocol for soft tissue management in the treatment of complex pilon fractures. J Orthop Trauma. 2004 Sep;18(8)

Suppl):S32-8.