■ TRAUMA

The use of the Ganga Hospital Score to predict the treatment and outcome of open fractures of the tibia

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Aims

Open fractures of the tibia are a heterogeneous group of injuries that can present a number of challenges to the treating surgeon. Consequently, few surgeons can reliably advise patients and relatives about the expected outcomes. The aim of this study was to determine whether these outcomes are predictable by using the Ganga Hospital Score (GHS). This has been shown to be a useful method of scoring open injuries to inform wound management and decide between limb salvage and amputation.

Methods

We collected data on 182 consecutive patients with a type II, IIIA, or IIIB open fracture of the tibia who presented to our hospital between July and December 2016. For the purposes of the study, the patients were jointly treated by experienced consultant orthopaedic and plastic surgeons who determined the type of treatment. Separately, the study team (SP, HS, AD, JD) independently calculated the GHS and prospectively collected data on six outcomes for each patient. These included time to bony union, number of admissions, length of hospital stay, total length of treatment, final functional score, and number of operations. Spearman's correlation was used to compare GHS with each outcome. Forward stepwise linear regression was used to generate predictive models based on components of the GHS. Five-fold cross-validation was used to prevent models from over-fitting.

Results

The mean follow-up was 11.4 months (3 to 31). The mean time to union was 9.7 months (3 to 21), the mean number of operations was 2.8 (1 to 11), the mean time in hospital was 17.7 days (5 to 84), the mean length of treatment was 92.7 days (5 to 730), the mean number of admissions was 1.7 (1 to 6), and the mean functional score (Lower Extremity Functional Score (LEFS)) was 60.13 (33 to 80). There was a significant correlation between the GHS and each of the outcome measures. A predictive model was generated from which the GHS could be used to predict the various outcome measures.

Conclusion

The GHS can be used to predict the outcome of patients who present with an open fracture of the tibia. Our model generates a numerical value for each outcome measure that can be used in clinical practice to inform the treating team and to advise patients.

Cite this article: *Bone Joint J* 2020;102-B(1):26–32.

Introduction

Open fractures of the tibia can be challenging to treat because of the complex interplay of a number of factors.[1-5] If the limb can be salvaged, the nature and extent of the injury, as well as the ability of the healthcare provider to offer specialist care, will ultimately determine both the treatment and outcome of the patient.[6-8] Patients and their relatives are frequently anxious about a number of issues, such as the total length of treatment, the number of operations that will be needed, the number of admissions, days spent in hospital, and the likelihood of returning to a level of function that enables them to carry out their daily activities.[9-12] These factors are important in decision-making and planning, especially in countries where the family is responsible for the financial costs of healthcare.[13] The ability of the healthcare professional to provide guidance on these important issues depends on their experience, which

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doi:10.1302/0301-620X.102B1.BJJ-2019-0853.R2 $2.00

Bone Joint J 2020;102-B(1):26–32.