

Minimally invasive plate osteosynthesis has equal safety to reamed intramedullary nails in treating Gustilo-Anderson type I, II and III-A open tibial shaft fractures



Sherif Galal

Department of Orthopaedic Surgery, Faculty of Medicine, Cairo University, P.O 11559, Cairo, Egypt

ARTICLE INFO

Article history:
Accepted 7 March 2018

Keywords:
Fixation
Fracture
Minimally invasive
Open
Tibia

ABSTRACT

Objectives: The best fixation method for open tibial fractures has long been a matter of debate, many studies have recommended the use of intramedullary nails over external fixation for treating such fractures, recent studies also showed favorable results for the use of plates in managing open tibial fractures. However, there are very few (if any) reports in the literature comparing the use of minimally invasive plate osteosynthesis to reamed intramedullary nails in the fixation of open tibial fractures. The aim of this study was to compare the safety & efficiency of minimally invasive plate osteosynthesis to reamed intramedullary nails in treating open tibial shaft fractures.

Design: A single-center, parallel group, prospective, randomized study.

Setting: Academic Level 1 Trauma Center, during the period from October 2014 to December 2016.

Patients: A total of 60 patients with open tibial fractures were randomized to reamed intra-medullary nails (R-IMN) (group A) or minimally invasive plate osteosynthesis (MIPO) (group B).

Outcome measurement: Patients were assessed for union (clinical & radiographic) & complications (e.g.; non-union, infection).

Results: No statistically significant differences were found between the 2 methods in term of the incidence of infection or non-union. Time to full union was shorter for the R-IMN group when compared to that of the MIPO group & that was found to be statistically significant.

Conclusion: MIPO technique has equal safety to R-IMN technique in treating Gustilo-Anderson type I, II and III-A open tibial shaft fractures, as both techniques have similar rate of infection & non-union. These findings suggest that the MIPO technique can be considered a valid treatment alternative for such fractures.

Level of evidence: Level II, Therapeutic study.

© 2018 Elsevier Ltd. All rights reserved.

Introduction

The best fixation method for open tibial fractures has long been a matter of debate. Many studies have recommended the use of intramedullary nails over the use of external fixation for treating such fractures [1,2]. Many studies showed that reamed intramedullary nails are superior to un-reamed intramedullary nails for the management of open tibial fractures, thus reamed nails became the most widely used method to treat these fractures [3–7]. Recent studies have also shown favorable results for the use of plates in managing open tibial fractures [8,9]. However, there are very few (if any) reports in the literature comparing reamed

intramedullary nails to minimally invasive plate osteosynthesis in fixation of open tibial fractures.

The aim of this study was to compare the safety & efficiency of minimally invasive plate osteosynthesis (MIPO) to reamed intramedullary nails (R-IMN) in treating Gustilo-Anderson [10] type I, II and III-A open tibial shaft fractures.

Methods

A single-center, parallel group, prospective, randomized study was conducted at an academic Level 1 Trauma Center, from October 2014 to December 2016.

During the study period, a total of 102 patients met the inclusion criteria and did not have any of the exclusion criteria.

Thirty-nine eligible patients were operated upon by orthopedic surgeons not participating in the study and were not included.

E-mail address: Sherif.Galal@kasralainy.edu.eg (S. Galal).

Three patients refused to participate in the study. A post hoc analysis showed that the 60 patients included in the study did not differ in regard to age, gender, or fracture type compared with the 42 patients who were eligible but were not included in the study.

Inclusion criteria were:

1. Patients 16–60 years old at the time of injury.
2. Open tibial shaft fracture Gustilo-Anderson type I, II, or III-A

Exclusion criteria were:

1. open Gustilo-Anderson type III-B or III-C
2. Closed, periarticular or pathological fractures
3. Patients with concomitant fractures in the ipsilateral limb

Patients were randomized using computer-generated random numbers, which were printed and placed in sealed envelopes before the study started, randomization was blinded to all examiners. Simple randomization was used and the envelopes were opened in the operating room, just prior to the surgery. Surgical instruments for both procedures were available.

Thirty patients were randomized to each group. In one group the fracture was fixed using reamed intramedullary nails (R-IMN) (group A) and in the other group the fracture was fixed using minimally invasive plate osteosynthesis (MIPO) (group B). All patients received the allocated surgical treatment. No patients

were lost to follow-up, so all patients were available for the intention to treat analysis at final follow-up.

Group A included 30 males, while group B included 22 males and 8 females. All fractures were located in the tibial shaft (middle half of the tibia). All patients underwent 1–2 surgical debridement procedure(s) before performing fracture fixation. In the emergency department (ED), where all patients presented after the initial trauma, all wounds were irrigated with 10 liters of normal saline and a prophylactic dose of intravenous (IV) antibiotics (cephalosporin) was administered [11]. Additionally, prior to each subsequent surgery (debridement or fracture fixation), a single dose of prophylactic IV antibiotic (cephalosporin) was administered.

The mean age for group A (R-IMN) was 35.2 ± 3.1 years, while that for group B (MIPO) was 38.8 ± 4.3 years.

The mode of trauma in group A was motor-bike accident in 8 (26.6%) patients, motor car accident in 4 (13.4%) patients, road traffic accidents in 12 (40%) patients and fall from a height in 6 (20%) patients. The mode of trauma in group B was motor-bike accident in 12 (40%) patients, motor car accident in 12 (40%) patients, road traffic accidents in 4 (13.4%) patients and fall from a height in 2 (6.6%) patients.

The fracture pattern in group A was comminuted fracture in 20 (67%) patients, transverse fracture in 6 (20%) patients and spiral

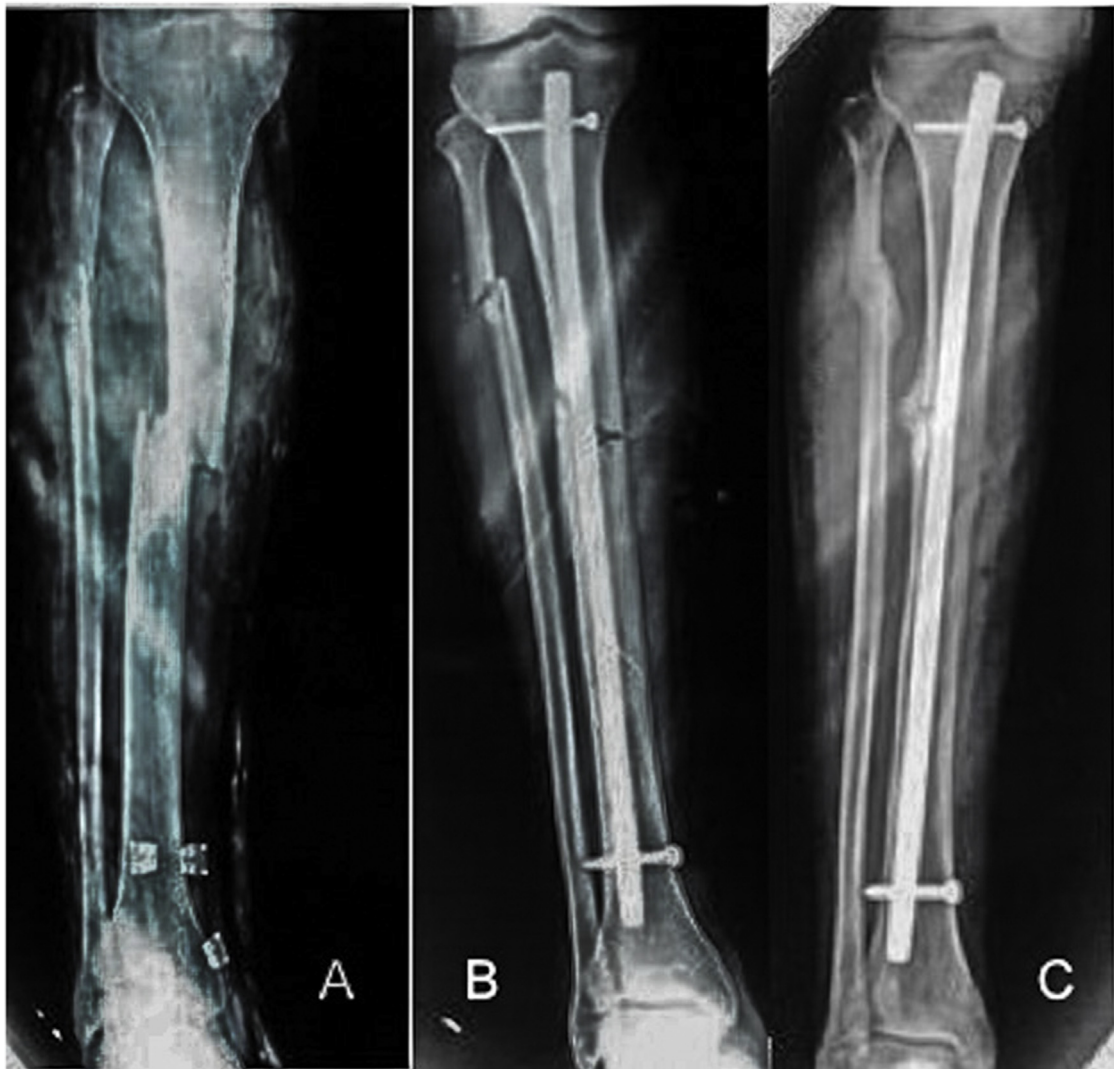


Fig. 1. Representative X-rays of a patient in the Intramedullary nailing group. **A:** Pre-operative, **B:** Post-operative, **C:** Final follow-up.

Download English Version:

<https://daneshyari.com/en/article/8718691>

Download Persian Version:

<https://daneshyari.com/article/8718691>

[Daneshyari.com](https://daneshyari.com)