Author's response to reviews

Title: Treatment of distal tibial fractures with the Ilizarov external fixator A prospective observational study in 39 consecutive patients

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Author's response to reviews: see over
Author’s covering letter for initial submission

Title: Treatment of distal tibial fractures with the Ilizarov external fixator A prospective observational study in 39 consecutive patients

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Comments: see over
Dear Editor, Dr Michael Zlowodzki,

Regarding manuscript MS 5743090576766369, 'Treatment of distal tibial fractures with the Ilizarov external fixator - a prospective observational study in 39 consecutive patients'

Thank you for your correspondence of 12th September and the accompanying reviewers’ comments. Please find below our response to these comments, giving a point-by-point response and the manuscript has been revised accordingly.

We hope that the revision of the manuscript, and our answers to the questions, will be satisfactory, and we look forward to hearing from you.

Yours sincerely,

Telmo Ramos

Associate editor comment

1) The fracture types are a mixed bag: Extra-articular fractures and intra-articular fracture ? especially C3 intra-articular fractures are different problems with different treatment options.

Our comment: Our paper presents the treatment of consecutive patients during a six year period in a trauma center and the spectrum of fractures reflects a standard clinical setting for many trauma orthopaedic surgeons. We have addressed the different treatment options in the discussion.

2) A lot of the discussion centers around a staged treatment protocol which is not applicable to the majority of extra-articular fractures which constitute a large portion of this study population.

Our comment: The majority of patients included in this study had severely dislocated fractures, i.e. also the extra-articular fractures had a definite risk of soft tissue damage. This has now been clarified in the manuscript and we have also pointed out that the rationale with our choice of treatment was to avoid soft tissue complications.

3) The majority of the studies cited in the discussion applies to severe intra-articular fractures, whereas the majority of the patients in the present study have sustained
either extra-articular or simple intra-articular fractures (C1 and C2). In the present study only 2 patients with a C3 fracture re enrolled.

Our comment: We have rewritten this part of the discussion regarding extra-articular fractures and only included the appropriate references.

4) The overall number (n=39) is relatively low and the authors do not present anything new that hasn’t been published already in numerous other papers.

Our comment: The interesting point is that an advantage with the present study is that the Ilizarov method was used in consecutive patients with distal tibia fractures and the majority of these patients had other complicating conditions, such as soft-tissue injuries, diaphyseal fracture extension, etc. The advantage of the Ilizarov technique in many types of distal tibial fractures is that the surgeon does not need to have concerns regarding which treatment to choose in the individual case. Questions such as: “When should the fracture be operated?”, ‘How large must the distal fragment have to be in order to allow treatment with an intramedullary nail?’, ‘Is there a fracture line in the articular surface which could widen during nailing?’, ‘Where and how should the plate be positioned in order to get the best stability?’; “Does the osteosynthesis allow for any weight-bearing at all and what happens if the patient accidently load the fractured leg? and ‘If and when the hardware should be removed?’ Moreover, the specific issues with removal of osteosynthesis is also overcome.

4) continued. The authors conclude that “the Ilizarov method should be the preferred treatment in most patients with comminute distal tibia fractures and definitely as an alternative to a staged procedure”. I believe that the conclusion is grossly overstated and cannot be made based on this study.

Our comment: We agree with this and the conclusion is rewritten accordingly.

Reviewer’s report
Reviewer: Boris Zelle
Background:
1) misspelling "Allgower"

This has been corrected

2) The references are in a little bit of disarray. Rüedi and Allgöwer did not suggest a staged treatment protocol, but they suggested the key steps for successful open reduction and internal fixation procedures of pilon fractures.
Our comment: Even if Rüedi and Allgöwer did not discuss the timing of the sequential management, several authors have later recommended that these key steps could/should be done in a staged protocol, depending on the state of the soft tissues. We have corrected the manuscript accordingly.

3) Some references are listed twice in the bibliography 8+13, 9+15

Our comment: The reference list has been rewritten and checked in accordance with the rewritten manuscript.

4) spelling: “metaphyseal”

Our comment: This has been corrected

5) Circular frames certainly have less blood loss, but certainly the main potential advantage is less surgical dissection

Our comment: This has been added

spelling: “therefore”

Our comment: This has been corrected

Methods
In this series, the authors only include 2 type C3 fractures, which are typically the challenging injuries. These are the fracture types that previous authors have investigated and have found significant problems with soft tissue complications. Reporting successful results using circular frames in a patient population that only includes 5% of type C3 fracture does not really allow any reference to previous case series that looked at high energy injuries.

Our comment: We understand this comment but as stated above the aim of the study was not to analyse the results according to fracture classification. As pointed out in the rewritten manuscript the majority of the patients had a injuries with potential risk of soft tissue complications, such as high energy injury, diagnosed soft tissue injuries according to the classification of Tschene and Gustilo & Anderson, comminution also in extra-articular fractures and diaphyseal extension of the fracture line. We have therefore corrected the manuscript accordingly.

Results
I am curious to hear more about the operating times. 352 minutes for application of a circular ring?

Our comment: This has been checked with the anesthesiological records and the time wrongly included the time of a complicated urinary catheter insertion where an urologist had to intervene adding approximately one hour to the surgical time. This has been corrected accordingly and therefore the range has been changed. The patient now having the longest operating time was operated for 314 minutes, which is also long but he had a Gustilo II injury and even if the fracture was “only” classified as
Rüedi and Allgöwer II, there was severe comminution in the metaphysis and he was therefore operated with a foot extension.

Discussion
1) Again, many patients in this series seem to be low-energy injuries and probably would not have required a staged protocol. Thus, avoiding a staged protocol does not quite seem to be an advantage.

Our comment: Parts of Results and Discussion have been modified focusing on the fact that the Ilizarov protocol represents a treatment algorithm applicable for a great variety the majority of fracture types in the distal tibia, including other complicating conditions, such as soft-tissue injuries, diaphyseal fracture extension, etc.

2) para 2, I assume that the authors mean hardware complications?

Our comment: This has been clarified.

3) I would not discuss application of Rh BMP-7. I think it is beyond the scope of this manuscript

Our comment: This has been deleted