Reviewer's report

Title: Comparison of Two Surgical Approaches for Displaced Intra-articular Calcaneal Fractures: Minimally Invasive Sinus Tarsi Versus Extensile Lateral Approach

Version: 3
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Reviewer: T Schepers

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See also attachment

Comparison of Two Surgical Approaches for Displaced Intra-articular Calcaneal Fractures: Minimally Invasive Sinus Tarsi Versus Extensile Lateral Approach

The authors retrospectively compare two approaches for displaced intra-articular calcaneal fractures; the extended lateral (ELA) and the sinus tarsi approach (STA). Below I would like to comment per section.

First the Major Compulsory Revisions and secondly the Minor Essential Revisions

Major Compulsory Revisions

Title: To my opinion the term ‘minimal invasive’ should be reserved for percutaneous approaches. The sinus tarsi approach is a ‘less invasive’ approach (not minimally invasive; as there are more restricted approaches)

This should be changed accordingly throughout the manuscript.


Method and results: I can see absolutely no reason to ask a patient about his functional outcome scores post trauma before surgery. While this might be of interest in malunions; patients just after their trauma have pain, cannot walk, etc, thus their scores are (as expected) low. And an increase after more than two years can also be expected. And these scores will differ significantly. I strongly advise against the use of scores before surgery in trauma.

Secondly, as this is a retrospective study, patients were asked to recollect their status almost 4 years ago. Which is highly inaccurate. [reference: Foot Ankle Int. 2001 Oct;22(10):775-8. An evaluation of the use of retrospectively acquired preoperative AOFAS clinical rating scores to assess surgical outcome after elective foot and ankle surgery. Toolan BC et al.]

Minor Essential Revisions
Abstract:
Line 29: ‘such as’ is incorrectly chosen
Line 31: there is only one outcome per technique, ‘outcomes’ is incorrect
Line 31: Incorrect phrasing. Change to: Sanders type-II and type-III fractures. (Sanders type-II to IV already imply that these are displaced intra-articular)
Overall, the background should include the ‘why’ of doing this study.
The method section should include the type of study. In this case ‘retrospective cohort study’
The result section contains too much data/numbers, which makes it difficult to read. Please restrict to the most important data (post-operative outcome scores and complications. Considering radiographic measurements you may limit to mentioning that there were no significant difference between the two approaches pre- and post-operatively.
The conclusion is concise.

Background:
The first and third sentence report almost the same. Please rephrase or combine sentence to one.
Line 60 The operative techniques consist of many more techniques than the three reported. Open and percutaneous reduction with internal or external fixation and primary arthrodesis.
Overall, the introduction can be shorter. Many trivial data on calcaneal fractures is reported (Line 58-72).
Focus on the need for the current study, not so much on the history of calcaneal fractures. Because of the high complication rates the less invasive techniques are more frequently used. However, may debate the accuracy and the outcome of these ‘new’ techniques.

Method:
Line 95. A sentence should not start with a number.
Line 95 is quite confusing. Please rephrase. Start for example with ‘A total of 30 cases were excluded for the following reasons…….’
Line 99: the more commonly used abbreviations are STA (sinus tarsi approach) and ELA (extended lateral approach)
Line 98-99: How was the decision made which fracture was treated via an ELA or via a STA. Where more simple fractures treated via a STA or was over time treatment protocol changed (which would clarify the difference in follow-up time of 10 months).
Line 105-114: the data presented here are the exact same data as presented in table 1. There is no need to repeat this data. Either remove from text or delete the table.
Line 119-123: the Sanders classification is the most frequently used, and people
interested in calcaneal fractures know this classification. Consider deleting the explanation text.

Line 124-126: three times the word ‘evaluate(d)’ in two lines. Please rephrase.

Line 138: calculation of the FFI. Usually the FFI is recalculated to range from 0-100. (so the score is divided by 230 and multiplied by 100)

See for example references:


Operative technique: Were both the procedures performed with the use of a tourniquet. If so, please mention.

Line 170; The use of plaster post-operatively in calcaneal fractures is obsolete. Secondary dislocation cannot be expected from non-weight bearing exercises, and a cast will most likely not prevent loss of reduction when weight bearing too soon. In some cases a cast for 2-3 weeks during wound healing can be considered, but longer periods can cause more stiffness and have been linked to lower outcome [reference: Wei et al. The University of Pennsylvania Orthopaedic Journal 14: 71–73, 2001]

What is the primary outcome: radiological or clinical. If clinical than this should be first described in method and result section.

Line 175 statistical analysis

As it can be expected that the presented data is not normally distributed it might be best to use the median and the interquartile range (P25-P75) rather than the averages +/-SD. I do not know the preferences of the journal.

Results:

Line 185-195: if you state that all radiographic results are in Table 2, than they do not have to repeated in full in text.

Decide what is your primary outcome, report these first (radiographic or clinical)

Line 1998-207: : if you state that all clinical results are in Table 3, than they do not have to repeated in full in text. Remove either the tables or condense the text to a single-sentence summary.

Remove the pre-operative scores as they are not useful and highly inaccurate.

Line 212: up to 15% wound complications have been reported in the STA, with an average of 5.2%. Zero percent is usually not the case. Retrospective analysis might underestimate the number of complications. Please make sure no
complications, (even mild like wound dehiscence, wound edge necrosis, prolonged drainage) were overlooked.

Discussion:
Line 226: group should read groups
Remove line 229-230 because of repetition
Line 231: the most commonly used term is extended lateral approach, change throughout manuscript (abbreviation ELA)
Line 234: incorrect use of term moreover
Line 236: remove also, or state percentages similar to the literature were identified
Line 242: sinus tarsi is not a minimal invasive; this term should be reserved for percutaneous techniques via stab incisions
Line 245: I am unable to find the '56 cases' in the manuscript by Holmes. They just state that: "RESULTS Over an 18-year period of using this approach, the author has not encountered any wound dehiscence, osteomyelitis, or wound infection."
Line 249: place 'space' between Hospodar and 'et'
Line 252: 'we also achieved successful reduction' should be addressed in the limitations. The only way to truly study reduction is by post-operative CT scan or per-operative 3D scanning. No step-offs were reported in the current study.
Line 255: a retrospective randomized trial simply does not exist
Line 267: confusing phrasing: 'results of the sinus tarsi approach were similar and favorable', please rephrase

Overall considerations:
1. Is the question posed by the authors well defined?
The ‘why’ of the manuscript needs to be stated more clearly in the background section
2. Are the methods appropriate and well described?
Yes, for detailed comments see above
3. Are the data sound?
Yes, even though zero complications is not very likely as most manuscripts show on average 5% complications
4. Do the figures appear to be genuine, i.e. without evidence of manipulation?
Yes
5. Does the manuscript adhere to the relevant standards for reporting and data deposition?
Yes
6. Are the discussion and conclusions well balanced and adequately supported
by the data?
Yes

7. Are limitations of the work clearly stated?
No, see detailed description above

8. Do the authors clearly acknowledge any work upon which they are building, both published and unpublished?
Yes

9. Do the title and abstract accurately convey what has been found?
Yes, some changes needed, see detailed description above

10. Is the writing acceptable?
Needs some work.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**
'I declare that I have no competing interests'