Reviewer’s report

Title: A feasibility study of 60 consecutive patients operated for unstable thoracic cage compared to historical controls treated in a mechanical ventilator

Version: 2
Date: 13 February 2014
Reviewer: Kevin Mani

Reviewer’s report:

Thank you for this interesting report on the feasibility of surgical treatment of multiple rib fractures. The manuscript includes data on outcome of surgical treatment of 60 patients with multiple rib fractures, as well as data on a historical cohort of patients treated conservatively. The results of surgical treatment are encouraging and the authors are to be commended on the excellent surgical outcome. Data on the surgically treated group of 60 patients are presented extensively. However, the historical cohort are only presented scarcely, and the only two data points compared between the two groups are the ISS score and the time on mechanical ventilation. These two variables indicate that the historical cohort had a higher ISS score than the surgically treated group (albeit not statistically significant), and time on mechanical ventilation was longer in the historical group which was treated conservatively.

Major compulsory revisions:

The study would benefit from a direct comparison of the groups both in terms of mechanism of injury, concomitant injuries as well as outcome and complications. In a best case scenario, the study would be conducted as a case-control, where the surgical group is matched against patients in the historical cohort with the same ISS score, in order to correct for this difference. If this is not possible, it would still be of interest to the reader to have comparative data on the historical cohort and the surgically treated group in terms of mechanism of injury, other concomitant injuries (Table 1), age and gender distribution (figure 1), deaths and complications etc. Other than the ISS score, these data should also be compared between groups with statistical tests.

In line with the previous comment, it is not appropriate to title the study as a comparison to “historical controls”. The study does describe the results of surgery, and compares the results (only to some extent) to that of a historical cohort. This cohort does not constitute a control group.

Although it is reasonable to conclude that the surgically treated patients had a shorter mechanical ventilator time, it would be of interest to assess this statistically. An option would be to perform a multivariate analysis including surgical vs conservative treatment and ISS score, as well as other relevant clinical data (e.g. age and gender), to assess if the time on mechanical ventilator is shorter when correcting for these potential confounders.
The authors underline the potential role of aggressive intrapleural surgery in reducing infectious complications. Did the historical cohort, that did not undergo surgery, have a higher rate of complications?

As I understand the manuscript, data on the surgically treated patients was entered into a database prospectively. It is not clear if the data on the historical cohort is based on a retrospective review of journals, or on prospective registration in the local trauma registry. Comparison of retrospectively collected data to a prospective database is problematic due to the risk of "selection bias", an issue that should at least be mentioned in the limitations of the current study.

Although the study indicates that surgical treatment of multiple rib fractures is feasible with excellent outcome, there is no health economic assessment in the current report. Thus it is not possible to conclude "The operative treatment is probably cost effective and can be recommended" based on the current analysis.

Minor essential revisions:
For products presented in the manuscript, please spell out the producing company, state and country of production (e.g. SPSS version 18.0 (IBM Corporation, Somers, NY)); the same applies to the Matrix system.

Please abstain from using abbreviations such as "KVITTRA"

Please correct spelling: Materials and Methods: "an epidural catheter into the pleura to ADD local anaesthesia; Chest x-rays in two PLANES were taken

Please explain the statistical test used for comparison of the curves presented in Figure 4.

**Level of interest:** An article of importance in its field

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

**Statistical review:** Yes, and I have assessed the statistics in my report.

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