Reviewer's report

Title: A new cable-tie based sternal closure system: Description of the device, technique of implantation and first clinical evaluation

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Reviewer: Andre Plass

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The authors present a new sternal closure technique of the company Synthes called Sternal ZipFix System.

After reading the introduction, which presents known data and the presentation of a new device, it raises the question what is exactly the target of this study. It seems moreless the description of a new device, the handling on a subjective level and the short term outcome, as already the headline notes, which would fit more as a How to do it article.

The methods are mainly reflecting the companies product information which would fit rather to product development paper.

The results of this study are of minor value since it is a description of a certain learning curve, which actually can be expected. The application seems very similar to the standard wires apart from the fixation mechanism. It is noted in results that „the type of sternal closure was designed according to cumulative preoperative risk factors as well as sternal quality, e.g. sternal width, sternal height and consistence“ . This note is not a result and should be mentioned in the methods section. However, the data on sternal quality would be interesting which should be mentioned in the results section.

The 4% mediastinitis (2of 50 patients) in this study reflects the known number of sternal infections named in the literature. Furthermore, the study shows no randomized control group and the patient number is small. It seems that the new device was not able to decrease the risk of postoperative complications compared to sternal wires. Next to sternal stability, a lower risk for potential infection should be the main focus of new sternal devices.

Also the radiographic examinations are not explained in more details. It is important to mention that stability cannot be confirmed in any radiographic examination (like written in results of the paper), however, only in the clinical examination. But with imaging the conditions of the sternum can be analyzed regarding sternal gap, dehiscence, retrosternal fluid and pseudoarthrosis. None of these data are available. Exact assessment of a sternum in an x-ray is not possible. CT scan is the first choice to evaluate a potential dehiscence or gap between the sternum halves. Also a beginning healing would be visible in a CT scan. In addition a CT could be performed for follow up and potential changes regarding a gap and/or development of a pseudoarthrosis can be picked up. But
it is unclear if such kind of CT scans were performed.

Besides the demographics table and one intraoperative picture, all other figures were company illustrations.

The discussion reflects the personal opinion and experiences of the authors which are surely interesting but it was not based on any substantial results.

For example it would be interesting to hear more about the cost factor. In many new sternal devices the higher costs compared to the sternal wires are an important issue. The cost difference was not mentioned, but can be expected as higher.

Even if two women had still stable sterna after mechanical resuscitation, this is definitely not a proof of a higher stabilization by the Sternal Zip Fix compared to sternal wires. Even a higher stability by this device sounds logic because of the specific biomechanical aspects and the larger implant-bone-contact, it would need a study design with randomized control group and higher patient number.

The conclusion of this study is that it is safe and effective use. But actually this new device shows no signs of a specific additional risk, the setting and application is nearly the same like sternal wires, except of the material of the band (plastic instead of steel, and slightly wider) and the fixation mechanism.

Real potential consequences could be drawn, if a prospective study with more patients and control group would be performed.

**Level of interest:** An article of limited interest

**Quality of written English:** Acceptable

**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.