Reviewer’s report

Title: Effect on the tensile strength of human acellular dermis (Epiflex(R)) of in-vitro incubation simulating an open abdomen setting

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Reviewer: Frank Pfeffer

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Review: Vitacolonna M et al. Effect on the tensile strength of human acellular dermis (Epiflex(R)) of in-vitro incubation simulating an open abdomen setting

This is an interesting paper dealing with the clinical relevant question of closure of an open abdomen situation by the use of human acellular dermis (Epiflex®). To clarify this question the authors use a simple in vitro model simulating this situation by incubating the mesh in different solutions. The biomechanical properties of the mesh were described by tensile strength and microscopic disaggregation.

The manuscript is well written, very comprehensive and could be accepted with discretionary revisions. But I have some comments:

1. Why did the authors choose human acellular dermis? To close the abdomen, the method described depends on biological characteristics of the mesh allowing direct contact with the intestine. Other biological meshes like xenogenic meshes (f.e. Permacol®) are clinically available and widely implemented in clinical use. It would be interesting to see how these meshes perform. What is the advantage of Epiflex®?

2. In a clinical setting you may have a situation with more than one fluid group (f.e. blood and bacteria). Why not use all fluids in one group?

3. The incubation is stopped after 21 days. Even in the Ringer solution group the tensile strength seems to decrease further on. If the mesh fails after 30 days, it is not suitable.

4. The authors comment limitations regarding their bacterial solution. How could they be aware that the upper GI fluid is still enzymatic active?

5. The microscopic analysis is not quantified. "the disaggregation seems to occur more rapidly and more distinct..." is the only result mentioned in the text. Fig.4 and 5 does not explain this finding. It would be better to show one image with little disaggregation and compare it with one image with disaggregation and explain the findings in the legend. Otherwise the microscopic analysis can be removed.

1. Is the question posed by the authors well defined? Yes
2. Are the methods appropriate and well described? The microscopic description
of disaggregation seems to be inappropriate.
3. Are the data sound? Data regarding tensile strength are sound. Figure 4 and 5 should be replaced or removed
4. Does the manuscript adhere to the relevant standards for reporting and data deposition? Yes
5. Are the discussion and conclusions well balanced and adequately supported by the data? Yes
6. Are limitations of the work clearly stated? Yes. The limitations regarding upper GI fluid could be discussed
7. Do the authors clearly acknowledge any work upon which they are building, both published and unpublished? Yes.

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

**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