Reviewer's report

Title: Gentamicin supplemented polyvinylidenfluoride mesh materials enhance tissue integration due to a transcriptionally reduced MMP-2 protein expression

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Reviewer: Abram Janis

Reviewer's report:

Binnebosel and colleagues describe the effects of the addition of 3 concentrations of gentamicin to a PVDF mesh on MMP-2 gene expression in a transgenic mouse model.

Introduction

• Mechanism of action for gentamicin activity against MMP-2 gene expression is never proposed
• Abbreviations are not defined early enough in text (PVDF,
• Beneficial interpretation of Collagen I/III ratio need to be supported, even if it is only a reference

o A short additional section on the additional benefits of antimicrobial activity of gentamicin in hernia repair would strengthen the paper

Methods

o Please report mean and std deviation for body mass of mice; only range is provided
o Please justify sample size of N=15 mice per group. What was the power determined necessary to detect predicted effect size by previous experiments?

o The mesh material description is difficult to follow on initial reading, please consider adding a table

o The carrier or vehicle for gentamicin during the addition to PVDF + PAAc is not described. Was it aqueous or in another solvent? If the carrier has the potential to interfere of generate artifacts, an additional control of PVDF + PAAc + vehicle needs to be considered, or justified away. This is my primary concern re: methods

o The section on gentamicin release, activity and cytotox testing were described in a previously published study. Including this small section doesn’t add much to the paper, and seems inappropriate for the methods section. Perhaps consider moving to the introduction and provide a brief summary of the findings.

o Surgical Procedure: a subcutaneously implanted mesh is described. Was this model selected to mimic an overlay repair? If so, would an incision in the underlying fascia have been more relevant? Please provide supporting references that specifically address clinical relevance.
o Time points should similarly be justified. Are these important clinical milesstones? Are these time points matched by earlier work and were chosen to allow comparison?

o Histology: The surveying/counting methodology is unclear. How many fields were assessed for each sample? The authors describe 10 measurements were performed, but it is unclear how these 10 samples were distributed.

o Was identity of beta-gal/MMP-2 expressing cells assessed? Is there concern that these cells were still prominent at 3 months?

Results

o MMP-2 expression: the first paragraph is unclear, and should be rephrased to improve clarity.

o Collagen I/III ratio: significance of this ratio in improving the response is not referenced or supported by the authors.

o The sections on Collagen I/III ratio, antimicrobial activity, Table 3 and Figure 3 appear to be identical to a paper in Langenbecks Arch Surg by this same group (2010, 395:413-420). If this is the same data, it should be removed and referenced instead.

Discussion

o Again, the authors should propose or summarize hypotheses on the mechanism of action of gentamicin on intracellular MMP-2 promotion and expression, here or in the introduction.

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