Reviewer's report

Title: Acute Cell Viability of the Meniscus Following Closed-Joint Knee Injury in a Lapine Model of Post-Traumatic Osteoarthritis

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Reviewer: Simo Saarakkala

Reviewer's report:

This article describes acute changes in cell viability in the meniscus and release of nitric oxide from tibial and femoral blocks after a closed-joint lapine injury model. After the impact authors found that a significant decrease in cell viability was observed in the lateral menisci compared to the menisci from control limbs. However, they did not find increase in release of nitric oxide (NO) after the impact.

The motivation of the study is important since the meniscus has not been studied much at tissue and cellular levels after impact-type traumas, especially with in situ trauma models. This paper comes from a group that has earlier done a good work for increasing our understanding on structure, composition and function of meniscus and its associated pathologies. Overall, the paper is well-written. Introduction is clear and gives a good background of the subject, Methods are clearly described and Results are easy to follow.

MAJOR COMPULSORY REVISIONS:

My major concern of this study is the generalizability of the results and conclusions due to a small number of animals. Altogether there were five rabbits in the study, and if I understood correctly, only four of them were used in cell viability analyses, three in NO analyses, and one in contact pressure measurements. Although authors found a statistically significant decrease in cell viability (I guess the effect was strong mainly because the areas at tear edges were analyzed) at the lateral menisci, the negative finding related to the release of NO might be explained by a limited number of animals (standard deviations are fairly large in NO concentrations). Furthermore, I think it is even incorrect to use the parametric statistics (like two-way ANOVA) when there are only so limited number of samples since the normal distribution cannot be assumed. Authors should justify their statistics, or remove statistical comparisons and keep the study at the descriptive level.

As a second limitation of the study design, a separate control group was not included, but instead contralateral legs were used as controls. Both of these issues are not mentioned as limitations in the Discussion part. Authors need to revise the text and clearly admit these limitations as well as discuss their consequences for the generalizability of the results.

Another remark for Discussion section: although authors shortly discuss about
the differences in joint loading between rabbits and humans, they could still expand this part of the discussion in order to give a clear view for the readers that these results might not be transferable to humans – mainly because of different loading conditions and consequent injury mechanisms in humans.

MINOR ESSENTIAL REVISIONS:
Please, indicate how much time it took from the impact to the point when the corresponding tibia and femur blocks were put in PBS and growth media.

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

Quality of written English: Acceptable

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

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