Reviewer's report

Title: Expression and pathological effects of periostin in human osteoarthritis cartilage

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Reviewer: Muneaki Ishijima

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Major Compulsory Revisions:
The authors examined both the expression levels of periostin mRNA and the expression patterns of periostin proteins in articular cartilage of the patients with knee osteoarthritis (OA). They also examined the effect of periostin for the OA-related gene expression in human chondrocytes in vitro. The mRNA expression of periostin in OA cartilage was significantly increased in comparison to that in control cartilage, which was extracted from the femoral head in patients with the osteoporotic fragile fractures. On the other hand, no significant differences of the mRNA expression of periostin in synovium was observed between the patients with knee OA and those with hip fractures. While no positive staining of periostin was detected in the control cartilage, the positive staining of periostin was detected in the OA cartilage. The positive staining of periostin was also detected in both the fibrous tissues on the cartilage surface and the fibrosis of subchondral marrow in patients with OA. In in vitro experiments, periostin induced the OA-related catabolic factors, such as MMPs and IL-6, in cartilage extracted from OA patients. In addition, NF-κB signaling was suggested to be the downstream signaling of periostin for these OA-related catabolic factors. Based on these results, the authors suggested the involvement of periostin in OA-pathologies.

1. Figure 1
The articular cartilage was almost disappeared and the eburnation change was observed in Figure 1A. In addition, as shown in Figure 3, the periostin expression was strongly detected in the fibrous tissues surrounding the degenerated the articular cartilage in patients with knee OA. However, the authors described that the articular cartilage was isolated from this lesion. Were these tissues extracted from the medial “condyle” of the tibia expressed the cartilage specific genes, such as type II- and type X collagen?

2. line 212- in Results
The in vitro experiments of this study were conducted using the “normal” chondrocytes extracted from the patients with femoral fragile fractures. Were the effects of periostin for the OA-related catabolic gene induction similar in patients
with knee OA?

3. Figure 1 legend

Figure 1 shows the tibial plateau of the patients with knee OA receiving TKA. While “M”, “LM” and “LL” indicate “medial condyle”, “medial area of the lateral condyle” and “lateral area of the lateral condyle” in the manuscript, I would suggest these should be “medial tibial plateau”, “medial area of the lateral tibial plateau” and “lateral area of the lateral tibial plateau”.

4. line 243- in Results

Even though periostin has been shown to induce NF-κB signaling, as described in Discussion (line 297- in Discussion), it is still unclear whether periostin really induce NF-κB signaling in chondrocytes in both control- and OA-patients.

5. Limitation of the study

The authors should mention the limitations of their study.

6. line 304 in Discussion

The final sentence should be the conclusion of the study. I would recommend that the authors should reconsider the final sentence of the manuscript in this point of view.

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: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:

I declare that I have no competing interests.