

Osteoarthritis and Cartilage



Letter to the Editor

Response to Letter to the Editor: the use of the term “mesenchymal stem cells” in our article is appropriate based on our laboratory study and the review of the literatures



Dear Editor,

We would like to thank Lee *et al.* for their thoughtful letter to the editor regarding our recent article on “Assessment of clinical and magnetic resonance imaging (MRI) outcomes after mesenchymal stem cell (MSC) implantation in patients with knee osteoarthritis (OA): a prospective study.” Our paper investigated the clinical and MRI outcomes of MSC implantation in OA knees and to determine the association between clinical and MRI outcomes. The points raised by Lee *et al.* are focused on the terms “MSC” and “stromal vascular fraction (SVF)” that used in our paper, and we would like to respond to the points raised. Their question is that “What exactly were used for treatment, cultured adipose-derived MSCs or the unexpanded SVF?” Before answering their question directly, it is important to note that we performed the entire process of isolation of adipose-derived MSCs from the SVF. We detailed the method for isolation of the adipose-derived MSCs contained in the SVF cells as described by Zuk *et al.*¹, and we identified the characteristics of MSCs, including self-renewal, expression of specific cell-surface markers, and capacity for multilineage differentiation. Accordingly, after isolating and characterizing process, a mean of 4.4×10^6 stem cells, contained in a mean of 4.9×10^7 SVF cells were prepared and used for MSC implantation.

In our study, as described in the methods section, we used the fibrin glue product as a scaffold for MSC implantation. The product was administered using two syringes; one contained fibrinogen and the other contained thrombin. This fibrin glue product is designed to form a gel instantaneously when the two solutions from each syringe are mixed. Actually, the cell suspension (SVF cells containing MSCs) was loaded into the thrombin solution, and then, the cell-thrombin suspension was mixed with the fibrinogen solution. Therefore, cell thrombin-fibrinogen suspension (i.e., SVF cells containing MSCs mixed with the fibrin glue) was implanted on the surface of the cartilage lesion. Of course, we used the SVF cells containing MSCs for MSC implantation in our study. However, we believe the therapeutic effect on OA must be due to the MSCs, and not from other cells contained in the SVF cells. Thus, we used the term “MSCs” in our study. According to the literatures, several authors have used the term “stem cells” in their studies concerning adipose-derived stem cells, even though SVF cells were actually

used for treatment^{2–11}. We consider that the above authors intended to report the therapeutic effects of the MSCs, and not those of the other cells contained in the SVF cells. Similarly, this context can be found in the article reported by Gobbi *et al.*¹², even though the stem cells in their study were not isolated from adipose tissue, but from bone marrow. In their study, they obtained bone marrow concentrate cells and used them to treat cartilage lesions. Despite using uncultured “bone marrow concentrate cells,” they used the term “stem cells” in the article as well as in the title. From these points of view, we believe that use of the term “MSCs”, contained in SVF cells, in our article is appropriate.

Lee *et al.* stated in the end of the letter to the editor that they request us to change the term “MSC implantation” in our article to “SVF cell implantation”. However, we think it is the editor's authority to decide whether use of the term “MSCs” is really erroneous in our article, after carefully reading the letter to the editor and our response. We request the editor respectfully read our response to the concerns of Lee *et al.*, and consider that we have responded properly to this claim.

Author contributions

Corresponding author drafted the original reply and all the other co-authors reviewed it.

Conflict of interest

The authors certify that we have no commercial associations that might pose a conflict of interest in connection with this article.

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