Reply to the Letter to the Editor

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Bone Marrow Aspirate Concentrate and Platelet-rich Plasma Enhanced Bone Healing in Distraction Osteogenesis of the Tibia

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To the editor,

In our investigation, we injected a combination of bone marrow aspirate concentrate (BMAC) and platelet-rich plasma (PRP) at the osteotomy site. Because of this approach, we could not determine which had a greater impact on bone healing, or whether they had any individual

synergistic or antagonistic effects on the bone. As you noted, we do mention these limitations in our paper. We also agree with the need for additional studies, perhaps using research designs along the lines you suggest.

The local application of the BMAC is gaining attention. In addition to its abundant mononuclear cells [6], it enables surgeons to perform both harvesting and transplanting at the same time during the surgery, preventing culture-related (in vitro) complications, such as decreased viability or contamination of the cells [6, 10]. The differentiation of osteoblasts from the BMC is well described and standardized [6].

The granules of platelet contain different kinds of growth factors, including platelet-derived growth factors, vascular endothelial growth factors, and transforming growth factor-beta [5]. These proteins set the stage for the tissue healing process, which includes cellular chemotaxis, proliferation, differentiation, and angiogenesis [3, 8].

The role of PRP in bone regeneration remains controversial, and while its mechanism is not yet fully understood, several experimental studies have identified a positive effect of PRP on bone healing [4, 5, 7]. Gandhi et al. [4] suggested that the PRP mediated early phase of bone repair process, up-regulated cellular proliferation, and improved mechanical strength of the healing bone. Kanno et al. [7] showed the PRP had a favorable effect on human osteoblast-like cells, and acted on enhancing bone regeneration. Gruber et al. [5] proved that the platelets stimulated the formation of osteoclast-like cells which can help bone growth and remodeling. Zhong et al. [11] reported that the PRP had similar ability

(RE: Lee DH, Ryu KJ, Kin JW, Kang KC, Choi YR. Bone marrow aspirate concentrate and platelet-rich plasma enhanced bone healing in distraction osteogenesis of the tibia. [published online ahead of print March 6, 2014]. *Clin Orthop Rel Res*. DOI: [10.1007/s11999-014-3548-3](https://doi.org/10.1007/s11999-014-3548-3).)

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with the BMAC on enhancing bone regeneration. However, there have been several other reports showing no effect of PRP on bone healing [1, 2, 9].

In light of these reports, I believe that BMAC may play a larger role than PRP. However, given the remaining gaps in our knowledge, I acknowledge that this matter will only be resolved by well-designed studies that have yet to be performed.

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