



Small-voxel reconstructions significantly influence SUVs in PET imaging

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Dear Sir,

We read with great interest the recent article by Fuentes-Ocampo et al. entitled “Digital vs. analog PET/CT: intra-subject comparison of the SUV_{max} in target lesions and reference regions” [1]. The authors aimed to assess whether digital photon counting technology in digital PET provides better quantification of SUV_{max} in lesions and reference regions than analogue PET. They conclude that both improved photon counting technology in digital PET and the effects of delayed increased uptake and retention significantly increase SUV_{max}, and that this has to be taken into account before the systems can be used interchangeably in follow-up studies.

In our opinion, there is an important limitation in their PET image reconstruction method that is not mentioned in their paper. Fuentes-Ocampo et al. compared digital PET using 2-mm voxel reconstructions with conventional PET using 4-mm voxel reconstructions. This difference in reconstruction approach invalidates their comparison, because the introduction of 2-mm voxel reconstructions on a conventional PET system already significantly increases SUVs [2, 3]. Fuentes-Ocampo et al. did not even cite these published studies. For example, in a conventional FDG PET study in 39 patients, we found an increase in SUV_{max} of 32% across 66 lesions when using small 2-mm voxels instead of 4-mm voxels, and the value increased to as high as 44% for lesions smaller than 11 mm diameter [2]. In comparison, Fuentes-Ocampo et al. reported a mean percentage difference of 35% across 87

lesions. This puts the conclusion of their paper on digital PET in a different light.

Perhaps it was not possible to perform 2-mm voxel reconstructions on the conventional PET system used by Fuentes-Ocampo et al. However, at least it should have been mentioned in the Discussion as a main study limitation, since it could have had a larger effect than the effects of two other limitations that were mentioned: the number of iterations and subsets, and the use of point-spread function modelling.

We emphasize that the image voxel size has a large effect on SUV_{max}, even on conventional non-digital scanners, and should therefore not be ignored in PET comparison studies. The use of both photon counting technology and different reconstruction settings, *including voxel size*, should be taken into account before different systems can be used interchangeably in follow-up studies.

Availability of data and materials Data sharing is not applicable to this article as no datasets were generated or analysed during the current study.

Authors' contributions D.K., P.L.J. and J.v.D. wrote the letter together. All authors read and approved the final manuscript.

Compliance with ethical standards

Ethics approval and consent to participate Not applicable

Consent for publication Not applicable

Conflicts of interest None.

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