Reviewer's report

Title: Semi-Automated Analysis of Standard Uptake Values in Serial PET/CT Studies in Patients with Lung Cancer and Lymphoma

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Reviewer: Ronald Boellaard

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General comments.

The paper compares SUVmax changes with and without image registration methodology for repositioning volume of interest and thereby more quickly and automatically SUVmax for corresponding lesions in serial PET/CT studies. There are several limitations which need to be addressed.

Major compulsory comments:

1. Introduction: the authors state that semi-automated quantification studies are still limited….I do not agree. There are a lot of papers dealing with automated PET tumor delineation and several papers in image registration. I suggest the authors perform a careful search in clinical literature databases. Some hints, look for “Schaefers, Nestle, Black, Lee and Geets, Hatt and Visvikis, Cheebsumon and Boellaard, Van Velden etc etc”…there are many papers on tumor delineation. Likewise there are several reports on the alignment of serial PET/CT scans.

2. SUVmax are compared with and without image registration functionality. However, SUVmax are calculated on different platforms. According to the authors one of these platforms performs a smoothing of the images, while the other does not. Therefore, results cannot be compared directly, i.e. the reader cannot really tell if there are no differences in SUVmax based response data due to use of the image registration procedure or not.

3. There is very limited information on the image registration method (which type of algorithm, rigid or deformable, cost function such as mutual information or correlation etc etc).

4. Are the images transform or is the VOI repositioned between serial scans?

5. Although the automated method enhances overall processing time, I wonder if the improvement is really clinically relevant. How long does the processing and image registration take? Usually image interpretation takes more time than doing the SUV read and changing from 1 min to 0.15 min is not really that important. Yet, the tools might be quite convenient to use. It would be more interesting to know if the tool can help to identify the same lesion in serial scans…any benefits there?

Level of interest: An article of limited interest
Quality of written English: Acceptable

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