Reviewer’s report

Title: Focal dose escalation using FDG-PET-guided intensity-modulated radiation therapy boost for postoperative local recurrent rectal cancer: a planning study with comparison of DVH and NTCP

Version: 1 Date: 11 January 2010

Reviewer: Matthias Guckenberger

Reviewer’s report:

The planning study evaluated the role and potential benefit of intensity-modulated treatment planning for locally recurrent rectal cancer and the potential of FDG-PET based definition of a simultaneous-integrated boost. The authors reported improved small bowel sparing with IMRT compared to 3D conformal treatment planning. Additionally, a simultaneous integrated boost to the FDG-PET positive (SUV >2) volume did not increase the small bowel NTCP.

Major Compulsory Revisions

• Page 10: You summed two dose distributions based on different CT data sets. Consequently, I expect to be your soft-tissue organs-at-risk at different positions, especially the small bowel. Consequently, a summation of the dose distributions without deformable image registrations is NOT possible. You either use deformable image registration for summation of treatment plans or report dose distributions of the boost plans, only.

• Page 15: you report a smaller NTCP for small bowel toxicity by the use of dose painting compared to IMRT, only. This is very hard to understand In summed plans 2 and 3, you used IMRT planning, the difference is an integrated boost in summed plan 3 with a dose escalation of 30% - I do not understand how an ADDITIONAL integrated boost could DECREASE the NTCP (all dose parameters in table 2 show higher doses for summed plan 2 compared to summed plan 3).

• Neoadjuvant radiochemotherapy is the standard for rectal cancer UICC stage > I. This has been shown be a significant number of randomized trials. It should be made more clearly that most of the patients with rectal cancer in current days have been treated with radiotherapy at primary treatment, which would not allow a treatment as described in this article.

Minor Essential Revisions

• Page 8: “Residual abnormal shadows in CT images after 40 Gy were defined as GTV2” please explain more in detail.

• Page 9: you used an IMRT objective of “maximum dose to small bowel <20Gy. This sounds strange considering that the prescribed dose is 20Gy and you treated patients with 40Gy before the boost. That could end up with a maximum dose of 60Gy – the total dose!
• Page 9: you did not use any ring shaped help volumes for inverse planning or any objectives for the small bowel?

• Page 14: was morphological tumor regression in the CT images prior to treatment and after 40Gy correlated with decrease of the SUV?

• The documentation of acute effects of 3D-CRT hardly fits to the general topic of the article, a retrospective planning study.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests