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2017-2018

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INVITATION to the Public defence of

Robbe Van den Begin

To obtain the academic degree of '**DOCTOR IN MEDICAL SCIENCES**'

Improving precision in Stereotactic Body Radiotherapy for oligometastatic disease.

Tuesday 10 July 2018

Auditorium **Vanden Driessche**, 17:00

Faculty of Medicine and Pharmacy, Laarbeeklaan 103, 1090 Brussel

How to reach the campus Jette:

<http://www.vub.ac.be/english/infoabout/campuses>

Summary of the dissertation

In the last decade, Stereotactic Body Radiotherapy (SBRT) is being increasingly used for the treatment of oligometastatic disease. Two previous trials in our center demonstrated a high survival and a low toxicity, but the local control was deemed suboptimal. The first part of this thesis therefore describes a study to uncover the root cause of this issue, by analyzing the recurrences in comparison with the irradiated volume.

The gained knowledge was used in a new prospective trial, with an emphasis on individual motion management. The introduction of the Vero SBRT system in our center allowed the implementation of dynamic tracking for lesions exhibiting large motion on 4D-CT imaging. Other lesions were treated with a motion-encompassing approach. This strategy was combined with a moderate dose escalation. The trial resulted in an adequate local control, offering a sensible treatment schedule, also suitable for lesions in close proximity to serial structures.

In the final part we investigated the factors that differentiate oligometastatic patients with varying prognoses. Five independent adverse factors were discriminated. A nomogram enables estimation of survival and corresponding risk groups were determined. These patient groups with distinctive prognoses can be taken into account when treatment strategies are defined in clinical guidelines or prospective trials.

Curriculum Vitae

Robbe Van den Begin graduated cum laude as a medical doctor at the Vrije Universiteit Brussel in 2011. During his specialty training in Radiation Oncology at the UZ Brussel, he started combining clinical work with research, focusing on oligometastatic disease and rectal cancer. Meanwhile, he took on some organizational duties in the department. During a three month internship in the UMC Utrecht, he worked on a research project evaluating rectal cancer shrinkage with MRI. In 2016 he graduated as a radiation oncologist and became staff member, working at the UZ Brussel and ASZ Aalst. He is married to Silke Vasseur, gynecologist, and became father of a lovely daughter on June 4, 2018.

Publications as first author:

- Van den Begin R et al. Impact of inadequate respiratory motion management in SBRT for oligometastatic colorectal cancer. *Radiother Oncol.* 2014;113(2):235-9.
- Van den Begin R et al. Motion management during SBRT for oligometastatic cancer: results of a prospective phase II trial. *Radiother Oncol.* 2016;119(3):519-24.
- Van den Begin R et al. The METABANK score: a clinical tool to predict survival after stereotactic radiotherapy for oligometastatic disease. *Radiother Oncol.* Under review.
- Van den Begin R et al. Tumor volume regression during preoperative chemoradiotherapy for rectal cancer: a prospective observational study with weekly MRI. *Acta Oncologica.* 2018;57(6):723-727.