

OPTIMIZING POSTOPERATIVE RADIATION THERAPY IN PROSTATE CANCER:

FOCUS ON SIDE EFFECTS, PRACTICAL IMPLEMENTATION AND DOSE DISTRIBUTION

Akademisk avhandling

som för avläggande av doktorsexamen vid Sahlgrenska akademien, Göteborgs universitet, kommer att offentligen försvaras i hörsalen Arvid Carlsson, Medicinaregatan 3, fredagen den 11 september kl 09.00

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Avhandlingen baseras på följande delarbeten:

- I. *A comparison of side-effects and quality of life in patients operated for prostate cancer with and without salvage radiation therapy*
Karin Braide, Jon Kindblom, Ulrika Lindencrona, Marianne Månsson, Jonas Hugosson
Published on line 3 July 2020 in *Scandinavian Journal of Urology*,
doi: 10.1080/21681805.2020.1782980
- II. *Salvage radiation therapy in prostate cancer: relationship between rectal dose and long-term, self-reported rectal bleeding*
Karin Braide, Jon Kindblom, Ulrika Lindencrona, Jonas Hugosson, Niclas Pettersson
Published on line 4 July 2020 in *Clinical and Translational oncology*,
doi:10.1007/s12094-020-02433-4
- III. *Risk of severe complications after postoperative radiation therapy of prostate cancer: Results from a nationwide population based retrospective cohort study.*
Karin Braide, Jon Kindblom, Pär Stattin, Jonas Hugosson,
Marianne Månsson
In manuscript
- IV. *The value of a bladder-filling protocol for patients with prostate cancer who receive post-operative radiation: results from a prospective clinical trial*
Karin Braide, Jon Kindblom, Ulrika Lindencrona, Marianne Månsson, Jonas Hugosson
Published on line 30 January 2019 in *Acta Oncologica*,
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OPTIMIZING POSTOPERATIVE RADIOTHERAPY IN PROSTATE CANCER:

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ABSTRACT

We analyzed side-effects, pre-treatment bladder preparations and dose distribution to the rectum in four different cohorts of patients, treated with postoperative radiotherapy (PRT) in prostate cancer. Side-effects according to a self-reporting survey revealed rectal bleeding as a main result in a follow up time of 6.7 years in median, since PRT, compared to a control group of men only treated with surgery only. Side-effects from the urinary tract was less pronounced between the groups and no difference was found according to sexual function or global quality of life (**Paper I**). Further analysis of rectal bleeding and its relationship to rectal dose volume parameters was performed and compared to a new treatment technique in order to develop a risk assessment method. We identified dose response relationships between rectal dose distribution and reported rectal bleeding which could be applied to a newer treatment technique in order to better evaluate the dose volume parameters and calculated risk of rectal bleeding (**Paper II**). A register based nationwide cohort study, of men prostatectomized between 1997 and 2016 was performed with focus on those men that had PRT added to the prior surgery. A comparison was made between the two groups focusing on severe side-effects that had been surgically handled. Interventions in the urinary and rectal tract were analyzed as were development of secondary malignancies and compared between the groups. Dominating were surgical interventions in the urinary tract in the PRT group with 3.66 higher risk per person year compared to the RP only group. The risk of development of bladder cancer was more than twice as big in the PRT group (**Paper III**). In a prospective clinical trial two different bladder preparation protocols were evaluated in men going through PRT. We could not detect any difference between the protocols according to bladder filling compliance or target localization (**Paper IV**).

Conclusion: this work has brought new insights on the development of late side effects in PRT and revealed areas of possible improvements in the practical work at the radiotherapy department.

Keywords: prostate cancer, postoperative radiation therapy, side-effects, practical preparations.

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