Prostate-specific Membrane Antigen Positron Emission Tomography-detected Oligorecurrent Prostate Cancer Treated with Metastases-directed Radiotherapy: Role of Addition and Duration of Androgen Deprivation

Stephanie G C Kroeze[1], Christoph Henkenberens[2], Nina Sophie Schmidt-Hegemann[3], Marco M E Vogel[4], Simon Kirste[5], Jessica Becker[6], Irene A Burger[7], Thorsten Derlin[8], Peter Bartenstein[9], Matthias Eiber[10], Michael Mix[11], Christian la Fougère[12], Hans Christiansen[2], Claus Belka[13], Stephanie E Combs[14], Anca L Grosu[5], Arndt Christian Müller[6], Matthias Guckenberger[15]

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Abstract

Background: Approximately 40-70% of biochemically recurrent prostate cancer (PCa) is oligorecurrent after prostate-specific membrane antigen (PSMA) positron emission tomography (PET) staging. Metastasis-directed radiotherapy (MDT) of PSMA-positive oligorecurrence is now frequently used, but the role of concurrent androgen deprivation therapy (ADT) remains unclear.

Objective: To determine the effect of concurrent ADT with PSMA PET-directed MDT on biochemical progression-free survival (bRFS).

Design, setting, and participants: This was a retrospective multicenter study of 305 patients with biochemical recurrence and PSMA PET-positive oligorecurrence following initial curative treatment between April 2013 and January 2018.

Intervention: MDT with fractionated or stereotactic body radiotherapy for all PSMA-positive metastatic sites; 37.8% received concurrent ADT.

Outcome measurements and statistical analysis: The primary outcome was bRFS, which was measured using Kaplan-Meier curves and log-rank testing. Secondary outcomes were ADT-free survival, overall survival (OS), and toxicity was analyzed using the Common Terminology Criteria for Adverse Events v4.03. Univariate and multivariate analyses were performed to determine independent clinicopathological factors.

Results and limitations: The median follow-up was 16 mo (interquartile range 9-27). Some 96% of the patients initially had high-risk PCa. A median of one (range 0-19) nodal metastases and one (range 0-5) distant metastases were treated. MDT+ADT significantly improved bRFS and remained an independent factor (hazard ratio 0.28, 95% confidence interval 0.16-0.51; $p<0.0001$). bRFS was not significantly different between MDT+≤6 mo of ADT and MDT alone ($p=0.121$). Patients receiving MDT had 1- and 2-yr ADT-free survival of 93% and 83%, respectively. New therapies, most frequently MDT (23%), were required more frequently after MDT (85% vs 29%; $p<0.001$). Grade ≥3 acute toxicity was observed in 0.9% of patients and late toxicity in 2.3%.

Conclusions: In this cohort of patients with oligorecurrent PCa, concurrent ADT with MDT improved bRFS significantly, but a large number of patients treated with MDT were spared from ADT for 2yr, although a greater need for other salvage therapies was observed.

Patient summary: The role of concurrent androgen deprivation therapy (ADT) with radiotherapy for prostate cancer oligorecurrence identified on prostate-specific membrane antigen positron emission tomography was studied. We concluded that radiotherapy alone could prolong the time to start of ADT. However, the risk of disease progression and consequently the need for further treatments is higher after local radiotherapy alone without immediate ADT.

Keywords: Antiandrogen therapy; Concurrent; Oligometastases; Prostate cancer; Prostate-specific membrane antigen; Radiotherapy; Recurrence; Stereotactic.