Stereotactic Ablative Radiation Therapy for the Treatment of Oligometastatic Prostate Cancer

Tran PT, Moyer CL, Radwan N, Ross AE, Reyes D, Wright J, Song D, DeVille C, DeWeese TL, Carducci M, Schaeffer EM, Pienta KJ, Eisenberger M

Dept. of Radiation Oncology, Urology, and Medical Oncology, Johns Hopkins Medicine, Baltimore, MD

Background: Local ablative treatment to limited metastatic or oligometastatic patients can result in long term disease-free survival in colorectal and sarcoma patients. The importance of consolidating all macroscopic tumor deposits in prostate cancer in the modern era is an unanswered question. Stereotactic ablative radiation (SABR) is highly focused, high-dose radiation that is ideally suited for treatment of oligometastatic patients. Here we report on the safety and preliminary clinical outcomes of a modern cohort of oligometastatic prostate cancer (OPC) patients treated with consolidative SABR at a single institution.

Methods: Records of all men with OPC, defined as up to 6 metastases (bone, lymph nodes and viscera) diagnosed on imaging (bone scan, CT, MRI or PET), who underwent consolidative SABR at our institution were reviewed. Demographic, pathologic, clinical and concurrent-adjuvant therapy data were collected from our IRB approved departmental prostate cancer radiotherapy registry. SABR was delivered in 1-5 fractions of 5-18 Gy using linear accelerator or robotic stereotactic technology. Kaplan-Meier method was used to assess local progression-free survival (LPFS), biochemical progression-free survival (bPFS; nadir+2) and distant progression free survival (DPFS).

Results: In total, 65 OPC patients were identified with 24 (37%) of those men presenting as synchronous OPC undergoing complete consolidation of primary and all metastatic sites. The remaining 41 men had recurrent or metachronous OPC. Median and mean follow-up was 42 and 49 weeks, respectively. The majority of men (49/65 or 77%) had hormone sensitive prostate cancer (HSPC) at the time of SABR with the remaining (16/46 or 23%) having castration resistant prostate cancer (CRPC). Most men were treated with concurrent hormonal therapy (52/65 or 81%). In total consolidative SABR was delivered to 129 metastases: 86 bone (67%), 38 nodal (29%) and 5 (4%) visceral metastases. Overall LPFS at 1-year was 83%. The bPFS and DPFS at 1-year were 74% and 81%, respectively. Crude Grade 1 and 2 acute toxicity were low at 29% and 11%, respectively, with no Grade 3 or higher acute toxicity.

Conclusions: Consolidative SABR in men with OPC is feasible and well tolerated. The heterogeneity and small size of our series limits interpretation of clinically meaningful outcomes following consolidative SABR in OPC, but our preliminary data suggests this approach is worthy of further prospective study. More definitive conclusions await the completion and reporting of prospective randomized studies such as the Belgian STOMP trial and our Baltimore ORIOLE trial.

Conflict of Interest: The authors declare no conflicts.

Funding Acknowledgement: PT Tran is funded by a Movember-PCF Challenge Award.