Influence of Pretreatment Magnetic Resonance Imaging on Local Therapy Decisions for Intermediate-Risk Prostate Cancer Patients

OAKLAND UNIVERSITY WILLIAM BEAUMONT

Christian Skowronski[1], Andrew Shanholtzer[1], Brent Yelton[1], Muayad Almahariq M.D. [2, 3], Daniel J. Krauss M.D. [2, 3]

[1]Oakland University William Beaumont School of Medicine
[2]Department of Biomedical Sciences, Oakland University William Beaumont School of Medicine
[3]Department of Radiation Oncology, Beaumont Health

Introduction

- Prostate cancer has the third highest incidence rate of cancer for men
- Prostate cancer is the second leading cause of cancer death for men in the United States
- Amongst diagnostic tools available for prostate cancer, magnetic resonance imaging (MRI) provides superior soft tissue delineation serving as a valuable tool for both diagnosis and treatment planning
- Minimal data currently exists regarding the practical utility of MRI for evaluation of intermediate-risk prostate cancer
- An evaluation of MRI influence on treatment plan will allow for protocol optimization of intermediate-risk prostate cancer by improving diagnostic information gathering requirements or, alternatively, relax the use of imaging resources below high-risk prostate cancer.
- The National Comprehensive Cancer Network's (NCCN) guidelines indicate MRI as optional in intermediate-risk prostate cancer evaluation
- Hypothesis: utilizing MRI for male patients with non-metastatic intermediate-risk prostate cancer would significantly alter the treatment pursued compared to individuals who did not receive an MRI prior to treatment initiation

Aims and Objectives

- This project aims to elucidate whether MRI affects radiation treatment decisions for intermediate-risk prostate cancer.

Intermediate-Risk Prostate Cancer Risk Stratification	
Patient has all of the following: Absence of high-risk and/or very-high-risk group features Has minimum one feature of intermediate risk factors: - cT2b-cT2c - Grade Group 2 or 3 - PSA 10-20 ng/mL	
Favorable Intermediate	Unfavorable Intermediate
All the following are required: - 1 intermediate risk factor - Grade Group 1 or 2 - <50% of biopsy cores result positive	Requires *at least* one of the following: - 2 or 3 intermediate risk factors - Grade Group 3 - ≥50% of biopsy cores result positive

Table 1: National Comprehensive Cancer Guidelines for diagnosis of intermediate-risk prostate cancer and respective subclassifications

Methods

- Retrospective Study
- Source: Beaumont Hospital (Royal Oak, MI) patients treated between 2019-2020 for definitive radiotherapy treatment of prostate cancer

↓

- NCCN Risk Stratification used to define intermediate-risk prostate cancer
- Sample size: 210 patients
- Groups: Pretreatment MRI versus No Pretreatment MRI

↓

Inverse probability of treatment weighting used to match the two groups for:

- Age
- Comorbidity index
- Pretreatment PSA
- Grade group
- American Urologic Association Symptoms Index
- Percent core involvement on prostate biopsy

↓

Treatment categorizations:

- External Beam Radiotherapy
  - Brachytherapy alone
  - Brachytherapy boost
  - Androgen deprivation

↓

Stats:

Wilcoxon rank Sum Chi-squared tests were used to compare continuous and categorical variables

Results

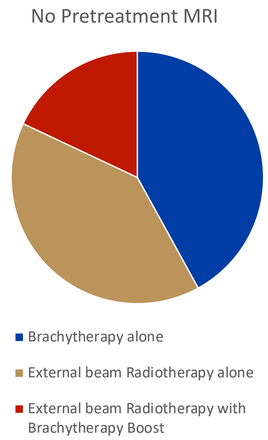
Eligible Patients: 210
Groups:
- 133 with pretreatment MRI
- 77 without pretreatment MRI

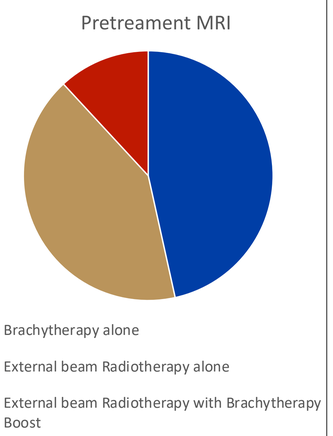
Following propensity matching, there were no differences between baseline characteristics between the two groups

<u>There is no statistically significant differences in treatments pursued between the two groups</u>

	No MRI	Pretreatment MRI
Brachytherapy Alone	42%	47%
External Beam Alone	40%	41%
External Beam w/ Brachytherapy boost	18%	12%
Androgen Deprivation	24%	17%

Table 2: Comparison of treatment selection classified by pretreatment MRI or no pretreatment MRI





Figures 1 & 2: Comparison of treatment selection between the group with pre-treatment MRI and no pre-treatment MRI

Conclusions

Pretreatment MRI does not significantly impact radiation therapy or androgen deprivation therapy decisions in patients with intermediate-risk prostate cancer.

Obtaining a pretreatment prostate MRI should be used judiciously and pursued only to answer a specific question, for which the answer is likely to impact treatment decision.

References

Cancer Facts & Figures 2019. (2019). American Cancer Society.
Clinical practice guidelines in oncology prostate cancer. (2017). *Network NCC.* https://ww.nccn.org/professionals/physician _gls/pdf/postate_blocks.pdf

National Comprehensive Cancer Network. (2023). NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines): Prostate Cancer. https://www.nccn.org/professionals/physician_gls/pdf/prostate.pdf

Acknowledgements

Special thanks to the Embark program directors, especially Dr. Dwayne Baxa