Impact of lymphovascular invasion on overall survival in patients with prostate cancer following radical prostatectomy according to pathological tumor stage

Marcus L. Jamil MD[1], Nikola Rakic[1], Jacob Keeley MS[1], Akshay Sood MD[1], Deepansh Dalela MD[1], Sohrab Arora MD[1], Natalija Kovacevic[1], Alyssa Danno[1], James O. Peabody MD[1], Mani Menon MD[1], Craig G. Rogers MD[1], Firas Abdollah MD[1]

[1] Vattikuti Urology Institute Center for Outcomes Research, Analytics and Evaluation (V Vattikuti Urology Vattikuti Urology Institute, Institute, CORE), Henry Ford Health System, Detroit, MI, USA

INTRODUCTION

BACKGROUND

- Histopathological assessment and subsequent pathological staging following radical prostatectomy (RP) are pivotal in allowing providers to determine the next appropriate step in care[1]

- Lymphovascular invasion (LVI) has been recognized as an adverse pathological feature in prostate cancer (PCa) [2,3]
  - Estimated prevalence of 5.1% to 52.9%
  - Association with higher Gleason grade, pathological T & N stage, risk of seminal vesical invasion and biochemical recurrence (BCR)

- The effect of LVI on overall survival (OS) is not as clear

OBJECTIVE

- To assess the impact of LVI on overall survival (OS).

METHODS

- **Patients identified within the National Cancer Database (NCDB)**
  - Patients with histologically confirmed non-metastatic PCa with positive or negative LVI status between 2010 to 2015 were included in analysis
    - Patients prior to 2010 were excluded due to lack of LVI recording
- **Primary Outcome:**
  - 5-year OS in patients with and without LVI on final pathology stratified by pathological T stage
  - Kaplan-Meir analysis used to assess overall survival of patients with and without LVI stratified by pathological tumor stage

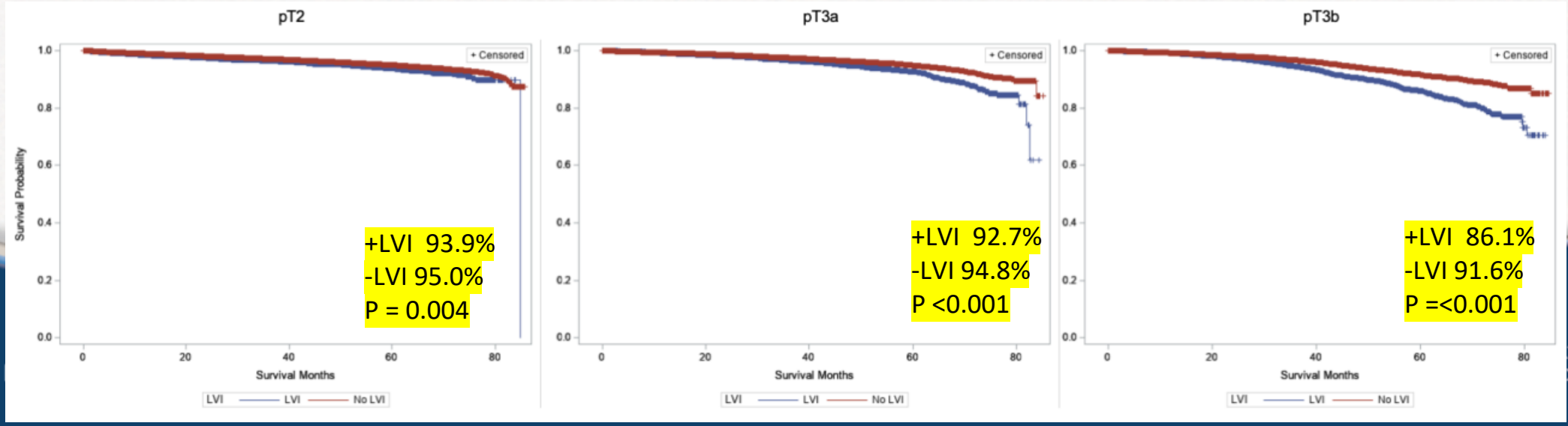
1. Mohler, J.L., et al., *Prostate Cancer, Version 2.2019, NCCN Clinical Practice Guidelines in Oncology.* J Natl Compr Canc Netw, 2019. **17**(5): p. 479-505.
2. Fajkovic, H., et al., *Validation of lymphovascular invasion is an independent prognostic factor for biochemical recurrence after radical prostatectomy.* Urol Oncol, 2016. **34**(5): p. 233.e1-6
3. Loeb, S., et al., *Lymphovascular invasion in radical prostatectomy specimens: prediction of adverse pathologic features and biochemical progression.* Urology, 2006. **68**(1): p. 99-103

RESULTS

- **232,704 with histologically confirmed non-metastatic PCa with positive or negative LVI status**
  - Median age (IQR) for all patients was 62 (56 – 67) years
  - Median PSA 5.6 (4.3 - 8.2) ng/mL
  - Median follow-up was 42.7 months (27.1 – 58.7)

	Entire Cohort	- LVI	+ LVI
LVI		214,946 (92.4)	17,758 (7.6%)
Gleason <=6	63,631 (27.3%)	62,799 (29.2%)	832 (4.7%)
Gleason 3 + 4	103,030 (44.3%)	98,872 (46%)	4,158 (23.4%)
Gleason 4 + 3	37,052 (15.9%)	32,250 (15%)	4,802 (27%)
Gleason 8 - 10	24,859 (10.7%)	17,187 (8%)	7,672 (43.2%)
pT2	174,838 (75.1%)	169,615 (78.9%)	5,223 (29.4%)
pT3a	40,281 (17.3%)	34,730 (16.1%)	5,551 (31.2%)
pT3b	17,585 (7.6%)	10,601 (4.9%)	6,984 (39.3%)
pN0	138,045 (59.3%)	127,236 (59.2%)	10,809 (60.9%)
pN1	6,129 (2.6%)	2,617 (1.2%)	3,512 (19.8%)
pNX	50,535 (21.7%)	48,764 (22.7%)	1,771 (9.9%)

	pT2	pT3a	pT3b
LVI Hazard Ratio	1.11 (p = 0.23)	1.22 p = 0.02	1.41 P < 0.0001



CONCLUSION

- Our report demonstrates the impact of LVI on OS in locally advanced PCa (pT3a and higher).
- This information may prove valuable when risk-stratifying based on final pathology and counseling patients regarding outcomes and determining the necessity of further adjuvant treatment.