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

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BACKGROUND

- Histopathological assessment and subsequent pathological staging following radical prostatectomy (RP) remains 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 LVI: 5.1% to 52.9%
  - LVI has been 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) has not been well established.

OBJECTIVE

- To assess the impact of LVI on overall survival (OS) in patients following RP.

MATERIALS AND METHODS

- All patients were 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

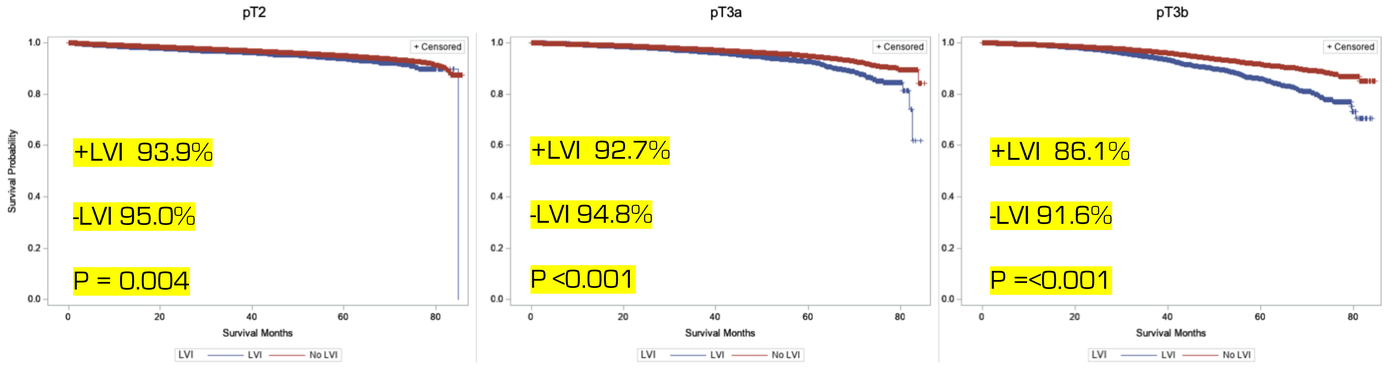
Table 1: Descriptive characteristics of all patients stratified by the presence or absence of lymphovascular invasion on final pathological specimen within the National Cancer Database between 2010 to 2015

	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%)

Table 2: Multivariable competing risks analysis and hazard ratios of all patients with histologically confirmed non-metastatic PCa with positive or negative LVI status between 2010 to 2015 within the National Cancer Database, stratified based on pathological tumor stage

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

Figure 1. Kaplan-Meier overall survival estimates of all histologically confirmed non-metastatic PCa with positive or negative LVI status between 2010 to 2015, within the National Cancer Database, stratified based on pathological tumor stage



RESULTS

- 232,704 patients 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)
- Higher proportion of patients with LVI was noted in patients with Gleason grade (8-10), pathological tumor stage (pT3a and pT3b) and LNI (Table 1).
- On multivariable analysis, LVI status was not an independent predictor of OS in pT2 disease (hazard ratio [HR]: 1.11, 95% confidence interval [CI] 0.92 – 1.35, p = 0.2). However in pT3a and pT3b disease, presence of LVI had 1.2-fold (95%CI: 1.03–1.44, p=0.02) and 1.4-fold (95%CI: 1.22–1.61, p<0.001) higher overall mortality than their counterparts without LVI (Table 2).
- 5-year OS in LVI vs. non-LVI patients is depicted in figure 1.

CONCLUSIONS

- 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.

REFERENCES

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