Predictors of Adverse Pathological Features following Robotic Radical Prostatectomy in patients with Low-risk Prostate Cancer.

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Purpose:

This paper aims to determine the proportion of low-risk prostate cancer patients who exhibit adverse pathological features (APF) in their final histology after undergoing robotic radical prostatectomy (RARP). It also seeks to identify characteristics that are linked to APF and report on the oncological outcomes.

Methods:

We reviewed 4,042 consecutive patients from February 2008 to June 2023 undergoing an RARP for low-risk prostate cancer, based on the D'Amico Risk Classification. APF was defined as extracapsular extension, seminal vascular invasion, positive surgical margins, ISUP grade group ≥ 3, or lymph node metastasis.

Results:

1,043 patients (26%) had APF features compared to 2,999 patients with no APF (74%). Table 1 shows Characteristics of patients included in the study.

Table 1. Characteristics of patients included in the study.

	Total (N=4,042)	Adverse pathological features (N=1,043)	No adverse pathological features (N=2,999)	P value
Pre-operative characteristics				
Age, years, median [IQR]	60 [55-66]	62 [57-67]	60 [54-65]	<0.001
Ethnicity: Proportion Black, n (%)	366 (9.1)	102 (9.8)	264 (8.8)	0.34
BMI, kg/m^2, median [IQR]	27.7 [25.3-30.3]	27.9 [25.4-30.8]	27.5 [25.2-30.2]	0.004
Smoking history, n (%)	1,058 (26.2)	325 (31.2)	733 (24.4)	<0.001
Charlson Comorbidity Index, (n, %)				
• 0	321 (7.9)	53 (5.1)	268 (8.9)	<0.001
• 1-2	2931 (72.5)	727 (69.7)	2204 (73.5)	
• 3-4	741 (18.3)	241 (23.1)	500 (16.7)	
• >4	49 (1.2)	22 (2.1)	27 (0.9)	
Family history of prostate cancer, n (%)	1553 (38.4)	373 (35.8)	1180 (39.4)	0.04
Family history of breast cancer, n (%)	549 (13.6)	153 (14.7)	396 (13.2)	0.24
AUA score, median [IQR]	7 [3-14]	7 [3-14]	7 [4-13]	0.30
SHIM score, median [IQR]	21 [15-25]	21 [14-24]	21 [16-25]	<0.001
PSA and Prostate Characteristics				
PSA, ng/mL, median [IQR]	4.8 [3.7-6.1]	5.2 [4.2-6.6]	4.6 [3.5-6.0]	<0.001
Prostate weight, grams, median [IQR]	51 [42-63]	48 [40-58]	52 [43-65]	<0.001
PSA density, ng/mL^2, median [IQR]	0.09 [0.06-0.12]	0.11 [0.08-0.14]	0.09 [0.06-0.11]	<0.001
MRI PIRADS lesion≥ 3, n (%)	404 (10.0)	151 (14.5)	253 (8.4)	<0.001

On multivariable analysis, only older age (62 vs 60 years old, OR=1.05, p-value<0.001), higher BMI (27.9 vs 27.5kg/m^2, OR=1.04, p-value<0.001), background of smoking (31.2% vs 24.4%, OR=1.22, p-value=0.018), lower prostate weight (48 vs 52 grams, OR=0.98, p-value=0.002), presence of a MRI-lesion ≥ PI-RADS 3 (14.5% vs 8.4%, OR=1.80, p-value<0.001) remained significant between groups.

Patients with APF had higher rates of biochemical persistence (1.9% vs. 0.07%, p-value<0.001) and 10-year cumulative incidence rates of BCR (19.8% vs. 3.2%, cumulative incidence rates difference=16.6%, 95%CI=12.5-20.6%) compared to patients with no APF.

Conclusion

In our study, over a quarter of patients with low-risk prostate cancer undergoing RARP exhibited APF. The presence and grade of a PI-RADS lesion maybe a useful tool in further risk stratifying patients with low-risk prostate cancer, particularly for patients that are considering immediate treatment.