

## Small-volume unilateral prostate cancer estimation results (super) score to aid candidate selection for focal therapy: Development and validation

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**Introduction:** Focal therapy for prostate cancer (PCa) has emerged as an intriguing approach for patients with localized disease. pT2a disease would likely represent the ideal candidates for hemiablativ focal therapy. To date, however, the incidence of pT2a is not well defined and there is difficulty in candidate selection. Herein we assess the incidence of pT2a in patients with unilaterally positive biopsy, develop and validate a scoring system to aid in candidate selection for further evaluation.

**Methods:** We retrospectively reviewed the DPC and SEARCH databases (1993-2011) and gathered data on 902 and 940 patients with unilaterally positive biopsy. SUPER score was developed in the DPC cohort based on logistic regression results using PSA, number of positive cores and Gleason scores. After assigning points according to the obtained coefficients, the incidence of pT2a was examined and the score stratified according to the likelihood of pT2a in low, intermediate and high tiers. The score was then validated in the SEARCH cohort.

**Results:** The incidence of pT2a was 17.1% in DPC and 16.6% in SEARCH. Univariable analyses in the DPC cohort showed associations between pT2a incidence and PSA levels, number of positive cores and Gleason scores. The SUPER score points were attributed based on logistic regression coefficients (Table 1). The total score ranges from 3 to 10 whereby higher score indicates higher probability of pT2a PCa. The SUPER score was stratified in low (3-6, 6% pT2a), intermediate (7-8, 15% pT2a) and high (9-10, 26% pT2a). When applied to the SEARCH cohort, the incidence of pT2a in low, intermediate and high SUPER score groups was 10%, 17% and 23%, respectively. AUCs of the SUPER score were 0.67 and 0.62 in DPC and SEARCH respectively.

**Conclusions:** The incidence of pT2a in men with unilaterally positive biopsy is approximately 17%. The developed and externally validated SUPER score allows for estimation of the likelihood of pT2a based on 3 simple biopsy variables. This tool is the first of its kind, allowing for a validated score system to aid in candidate selection and guide further evaluation for focal therapy.

Factor		OR	95% CIs	P value	Points
PSA	<4	3.70	1.68-9.35	0.002	4
	4-10	2.80	1.34-6.83	0.012	3
	>10	Ref	-	-	1
Positive cores	1	3.72	2.23-6.49	<0.001	4
	2	2.56	1.45-4.64	0.002	3
	3+	Ref	-	-	1
Gleason score	≤6	1.72	0.80-4.28	0.198	2
	7	1.60	0.70-4.15	0.291	2
	≥8	ref	-	-	1

Table 1: SUPER score development based on logistic regression results of factors associated with pT2a prostate cancer

A	Low (SUPER 3-6)	Intermediate (SUPER 7-8)	High (SUPER 9-10)
pT2a	16 (6.0%)	37 (15.0%)	101 (25.8%)
pT2b+	249 (94.0%)	209 (85.0%)	290 (74.2%)
Total	265 (29.4%)	246 (27.3%)	391 (43.3%)
B	Low (SUPER 3-6)	Intermediate (SUPER 7-8)	High (SUPER 9-10)
pT2a	32 (9.7%)	49 (16.7%)	77 (23.1%)
pT2b+	299 (90.3%)	245 (83.3%)	256 (76.9%)
Total	331 (34.6%)	294 (30.7%)	333 (34.8%)

Table 2: Incidence of pT2a prostate cancer based on the SUPER score in DPC (A) and SEARCH (B) cohorts