

**Table S1** Univariate and Cox proportional hazards models for PFS as the observed endpoint

Parameter	Univariate analysis		Cox regression model	
	HR (95% CI)	P	HR (95% CI)	P
Age, years				
80–84	1.00 (Reference)			
≥85	1.23 (0.79–1.90)	0.36		
CCI				
0	1.00 (Reference)			
1	1.26 (0.79–2.03)	0.33		
≥2	1.46 (0.86–2.48)	0.16		
TPSA				
4–20	1.00 (Reference)		1.00 (Reference)	
20.01–50	1.06 (0.59–1.89)	0.86	0.60 (0.31–1.14)	0.12
>50	1.88 (1.18–2.98)	0.007	0.66 (0.37–1.17)	0.15
Clinical stage				
T1–T2	1.00 (Reference)		1.00 (Reference)	
T3	1.73 (1.10–2.71)	0.02	0.82 (0.45–1.48)	0.50
T4	4.99 (2.93–8.52)	<0.001	1.35 (0.60–3.05)	0.47
Lymphatic metastasis				
None	1.00 (Reference)		1.00 (Reference)	
Yes	3.54 (2.30–5.44)	<0.001	1.79 (0.96–3.34)	0.07
Bone metastasis				
None	1.00 (Reference)		1.00 (Reference)	
Yes	3.66 (2.41–5.56)	<0.001	2.24 (1.27–3.94)	0.005
PNI				
None	1.00 (Reference)		1.00 (Reference)	
Yes	1.78 (1.18–2.69)	0.006	1.28 (0.82–2.01)	0.28
ISUP				
1	1.00 (Reference)		1.00 (Reference)	
2	1.25 (0.40–3.96)	0.70	0.89 (0.28–2.86)	0.84
3	2.58 (0.90–7.38)	0.08	1.89 (0.63–5.68)	0.26
4	2.87 (1.13–7.30)	0.03	1.59 (0.58–4.33)	0.37
5	5.70 (2.25–14.41)	<0.001	3.65 (1.32–10.06)	0.01
PSAD	1.01 (1.01–1.02)	0.001	1.01 (1.01–1.02)	0.03
Therapeutic regimens				
PT	1.00 (Reference)		1.00 (Reference)	
DT	0.42 (0.22–0.81)	0.01	0.47 (0.23–0.95)	0.04

PFS, progress-free survival; DT, definitive therapy; PT, palliative therapy; CCI, Charlson Comorbidity Index; TPSA, total prostate-specific antigen; PSAD, prostate-specific antigen density; PNI, perineural invasion; ISUP, International Society of Urological Pathology.

**Table S2** Univariate and Cox proportional hazards models for CSS as the observed endpoint

Parameter	Univariate analysis		Cox regression model	
	HR (95% CI)	P	HR (95% CI)	P
Age, years				
80–84	1.00 (Reference)			
≥85	0.95 (0.45–1.98)	0.89		
CCI				
0	1.00 (Reference)			
1	0.92 (0.40–2.11)	0.84		
≥2	1.55 (0.67–3.62)	0.31		
TPSA				
4–20	1.00 (Reference)			
20.01–50	0.96 (0.37–2.54)	0.94		
>50	1.96 (0.94–4.06)	0.07		
Clinical stage				
T1–T2	1.00 (Reference)		1.00 (Reference)	
T3	2.46 (1.26–4.82)	0.008	0.97 (0.38–2.50)	0.95
T4	5.32 (2.12–13.39)	<0.001	0.80 (0.23–2.77)	0.73
Lymphatic metastasis				
None	1.00 (Reference)		1.00 (Reference)	
Yes	5.41 (2.73–10.74)	<0.001	2.63 (1.03–6.71)	0.04
Bone metastasis				
None	1.00 (Reference)		1.00 (Reference)	
Yes	7.24 (3.57–14.65)	<0.001	3.92 (1.53–10.02)	0.004
PNI				
None	1.00 (Reference)			
Yes	1.85 (0.97–3.53)	0.06		
ISUP				
1	1.00 (Reference)		1.00 (Reference)	
2	0.31 (0.03–2.96)	0.31	0.20 (0.02–2.05)	0.18
3	0.93 (0.19–4.65)	0.93	0.71 (0.13–3.88)	0.70
4	2.27 (0.67–7.76)	0.19	1.01 (0.25–4.13)	0.99
5	3.71 (1.09–12.67)	0.04	2.01 (0.49–8.21)	0.33
PSAD	1.01 (0.99–1.02)	0.28		
Therapeutic regimens				
PT	1.00 (Reference)		1.00 (Reference)	
DT	0.09 (0.01–0.67)	0.02	0.09 (0.01–0.68)	0.02

CSS, cancer-specific survival; DT, definitive therapy; PT, palliative therapy; CCI, Charlson Comorbidity Index; TPSA, total prostate-specific antigen; PSAD, prostate-specific antigen density; PNI, perineural invasion; ISUP, International Society of Urological Pathology.

**Table S3** Baseline characteristics

Parameter	Elderly suspected prostate cancer (n=376)	Negative (n=59)	Prostate cancer (n=296)	P value
Age, years [median (IQR)]	83 (81–85)	82 (81–84)	82 (81–84)	0.60
Body mass index, kg/m <sup>2</sup> [median (IQR)]	23.3 (21.1–25.4)	22.8 (21.0–24.3)	23.4 (21.8–25.5)	0.20
PSAD, ng/mL/cm <sup>3</sup> [median (IQR)]	0.59 (0.20–1.21)	0.12 (0.07–0.19)	0.84 (0.39–1.93)	<0.001
PV, mL [median (IQR)]	47.0 (35.4–77.3)	89.0 (61.1–121.7)	46.0 (34.6–70.1)	<0.001
PSA at biopsy, ng/mL [median (IQR)]	23.7 (11.1–44.3)	11.3 (8.37–17.5)	37.2 (16.8–114.3)	<0.001
PSA, ng/mL, n (%)				<0.001
4–20	151 (40.2)	49 (83.1)	88 (29.7)	
20.01–50	90 (24.0)	9 (15.3)	80 (27.0)	
50.01–100	52 (13.8)	1 (1.69)	50 (16.9)	
>100	83 (22.1)	0 (0.00)	78 (26.4)	
Comorbidity, n (%)				
Diabetes	61 (16.2)	7 (11.9)	51 (17.2)	0.31
Hypertension	170 (45.2)	27 (45.8)	132 (44.6)	0.35
CHD	73 (19.4)	7 (11.9)	65 (22.0)	0.09
CVD	46 (12.2)	7 (11.9)	36 (12.2)	0.47
Expectation of life, years [median (IQR)]	6.91 (6.0–7.9)	7.39 (6.44–7.90)	7.39 (6.44–7.90)	0.54

PSA, prostate-specific antigen; PSAD, prostate-specific antigen density; PNI, perineural invasion; IDC-P, intraductal carcinoma of the prostate; G8, geriatric 8; CGA, comprehensive geriatric assessment; CISR-G, cumulative illness rating score-geriatrics; CHD, coronary atherosclerotic heart disease; CVD, cerebrovascular disease; ISUP, International Society of Urological Pathology.

**Table S4** Baseline characteristics before/after PSM

Parameter	Before PSM					After PSM				
	Total (n=296)	PT (n=256)	DT (n=40)	P	SMD	Total (n=149)	PT (n=109)	DT (n=40)	P	SMD
Age, years, mean ± SD	82.94±2.71	83.11±2.74	81.88±2.24	0.007	-0.550	81.90±2.03	81.91±1.96	81.88±2.24	0.93	-0.015
PSA, ng/mL, mean ± SD	110.87±361.28	122.41±386.72	36.98±54.61	0.17	-1.564	47.34±77.03	51.14±83.66	36.98±54.61	0.32	-0.259
FPСА, ng/mL, mean ± SD	11.61±26.33	12.72±28.06	4.57±5.99	0.07	-1.359	5.44±7.26	5.76±7.68	4.57±5.99	0.38	-0.199
PV, mL, mean ± SD	56.29±32.70	58.45±33.81	42.51±19.77	<0.001	-0.807	45.78±23.52	46.99±24.73	42.51±19.77	0.30	-0.227
PSAD, ng/mL/cm <sup>3</sup> , mean ± SD	3.58±16.24	4.00±17.43	0.90±1.38	0.26	-2.246	1.06±1.55	1.12±1.60	0.90±1.38	0.44	-0.160
TPSA, n (%)				<0.001					0.33	
4–20	88 (29.73)	66 (25.78)	22 (55.00)		0.587	67 (44.97)	45 (41.28)	22 (55.00)		0.276
20.01–50	80 (27.03)	70 (27.34)	10 (25.00)		-0.054	45 (30.2)	35 (32.11)	10 (25.00)		-0.164
>50	128 (43.24)	120 (46.88)	8 (20.00)		-0.672	37 (24.83)	29 (26.61)	8 (20.00)		-0.165
Clinical stage, n (%)				0.002					0.63	
T1–T2	181 (61.15)	147 (57.42)	34 (85.00)		0.772	123 (82.55)	89 (81.65)	34 (85.00)		0.094
T3	80 (27.03)	74 (28.91)	6 (15.00)		-0.389	26 (17.45)	20 (18.35)	6 (15.00)		-0.094
T4	35 (11.82)	35 (13.67)	0 (0.00)		-0.428					
CCI, n (%)				0.64					0.83	
0	180 (60.81)	153 (59.77)	27 (67.50)		0.165	96 (64.43)	69 (63.30)	27 (67.50)		0.090
1	73 (24.66)	65 (25.39)	8 (20.00)		-0.135	30 (20.13)	22 (20.18)	8 (20.00)		-0.005
≥2	43 (14.53)	38 (14.84)	5 (12.50)		-0.071	23 (15.44)	18 (16.51)	5 (12.50)		-0.121
ISUP, n (%)				0.007					0.62	
1	30 (10.14)	21 (8.20)	9 (22.50)		0.342	23 (15.44)	14 (12.84)	9 (22.50)		0.231
2	33 (11.15)	25 (9.77)	8 (20.00)		0.256	30 (20.13)	22 (20.18)	8 (20.00)		-0.005
3	39 (13.18)	33 (12.89)	6 (15.00)		0.059	20 (13.42)	14 (12.84)	6 (15.00)		0.060
4	105 (35.47)	96 (37.50)	9 (22.50)		-0.359	41 (27.52)	32 (29.36)	9 (22.50)		-0.164
5	89 (30.07)	81 (31.64)	8 (20.00)		-0.291	35 (23.49)	27 (24.77)	8 (20.00)		-0.119

PT, palliative therapy; TPSA, total prostate-specific antigen; PSAD, prostate-specific antigen density; CCI, Charlson Comorbidity Index; ISUP, International Society of Urological Pathology.