

# Comparison of Outcomes Between Single-Port and Standard Robot-Assisted Radical Prostatectomy: An Analysis of Early Experiences at a High-Volume Center and the Pooled World Experience

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## Background

- In the past decade, robot-assisted laparoscopic radical prostatectomy (RALRP) has gained widespread acceptance as an approach for the definitive surgical treatment of localized prostate cancer.
- The da Vinci single port (SP) system offers the ability to perform RALRP through a single abdominal incision (SP-RALRP).
- There are many potential benefits to SP-RALRP, including improved cosmesis, reduced pain, and facilitation of new surgical approaches.
- We performed an early comparative study of outcomes between SP-RALRP and standard RALRP.**

## Methods

### COHORTS

- All men who underwent SP-RALRP at Johns Hopkins from December 2018 – December 2019 (“SP-RALRP” cohort).
- Additionally, a pooled analysis of all reported SP-RALRP series to date was performed (“Pooled SP” cohort). (**Table 1**)
- The comparison group was men who underwent standard RALRP at Johns Hopkins (July 2017 – November 2018) and were prospectively followed for a clinical trial with an unrelated endpoint (NCT03006562, PREVENTER) (“Standard RALRP” cohort).

### OUTCOMES

- Patient characteristics, perioperative data, and post-operative outcomes were compared using Wilcoxon-rank sum and Fisher’s exact test as appropriate.
- Complications at 30 days were evaluated using the Clavien-Dindo classification system and rates were compared between groups using Fisher’s exact test.

## Conclusions

- The experience of a single high-volume institution and the pooled worldwide SP experiences to date demonstrate early non-inferiority of SP-RALRP compared to standard RALRP.**
- Rates of lymph node dissection are lower with the SP system, which may be a matter of experience or a potential limitation of the SP system’s performance.
- SP-RALRP should continue to gain acceptance as surgeons become more familiar with the system.
- Future avenues of research may focus on cost-equivalence between approaches and on patient-reported outcomes with regards to quality of life, urinary continence, sexual function, and recovery from surgery.

## Results

### BASELINE CHARACTERISTICS

- At our institution, 26 men underwent SP-RALRP and 376 underwent standard RALRP.
- 208 men were included in the pooled SP-RALRP cohort, including our 26 patients.
- The mean age was 62.1 (SP-RALRP), 62.7 (pooled SP), and 61.3 (standard RALRP).
- The most common biopsy grade was Gleason Score 3+4 (GG 2) – 42% of SP-RALRP and 36% of standard RALRP.
- There was no statistically significant difference in race, clinical stage, or PSA between SP-RALRP and standard RALRP at our institution.
- There was higher rate of D’Amico high-risk cancer in the SP-RALRP group (38% vs. 23%, p=0.04).

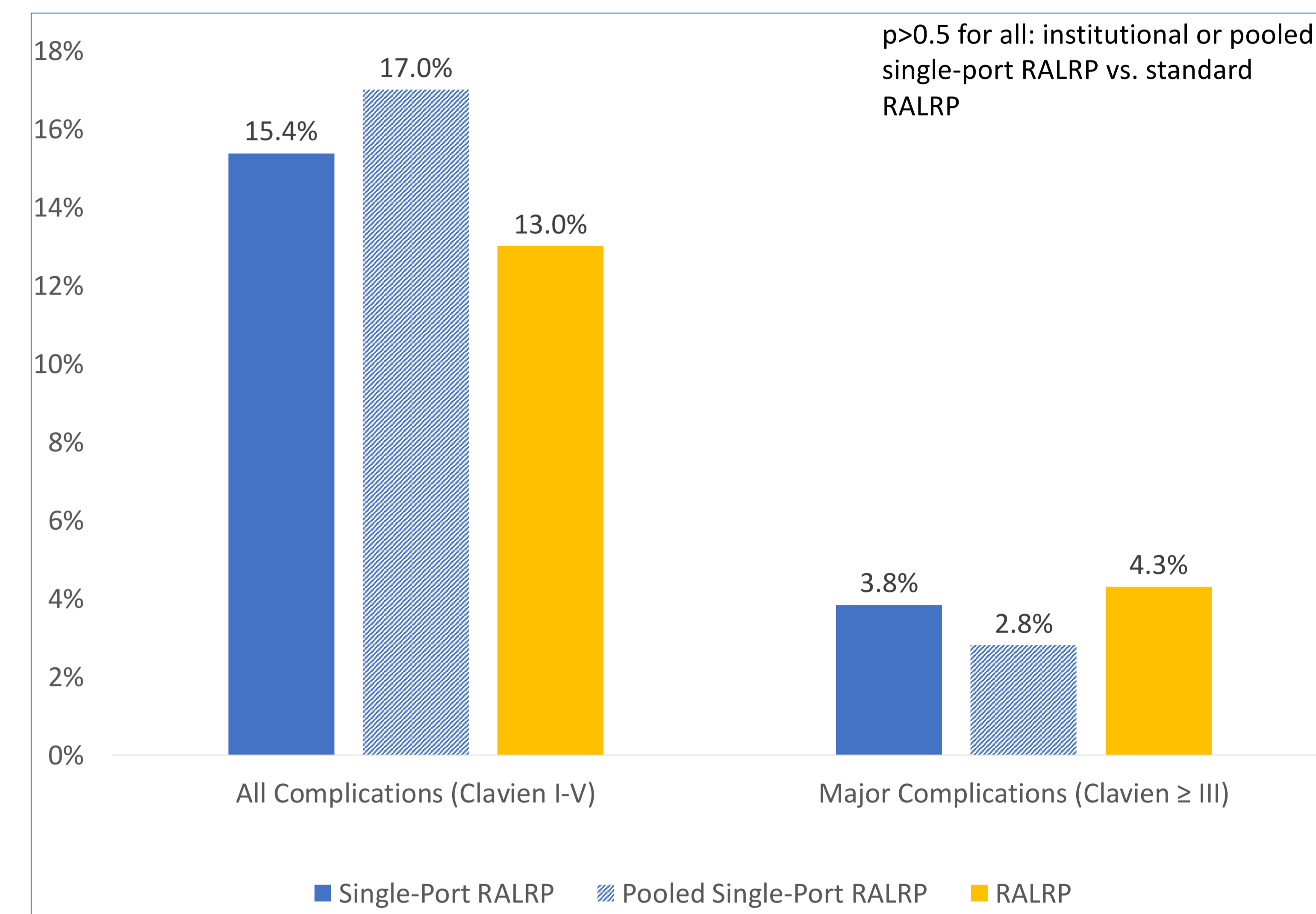
### PERIOPERATIVE AND PATHOLOGICAL DATA

- There was a significant difference in rate of pelvic lymph node dissection: SP-RALRP – 65%, pooled SP – 73%, standard RALRP – 83% (p=0.03 and 0.003 vs. standard RALRP).
- The average number of pelvic lymph nodes removed was lower for SP groups: SP-RALRP – 6.1, pooled SP – 9.6, standard RALRP – 11.7 (p=0.002 and 0.02 vs. standard RALRP).

### COMPLICATIONS AND PAIN DATA

- At our institution, there was no difference in maximum patient-reported pain score at 24 hours prior, 12 hours prior, or at discharge (p>0.2 for all comparisons). (**Figure 1**)
- At our institution, there were a total of 4 Clavien complications among the SP-RALRP men, of which 1 was a major† complication (Clavien grade ≥ III).
- The rates of overall and major (Clavien grade ≥ III) complications were equivalent between SP-RALRP and RALRP (p>0.5 for all comparisons). (**Figure 2**)

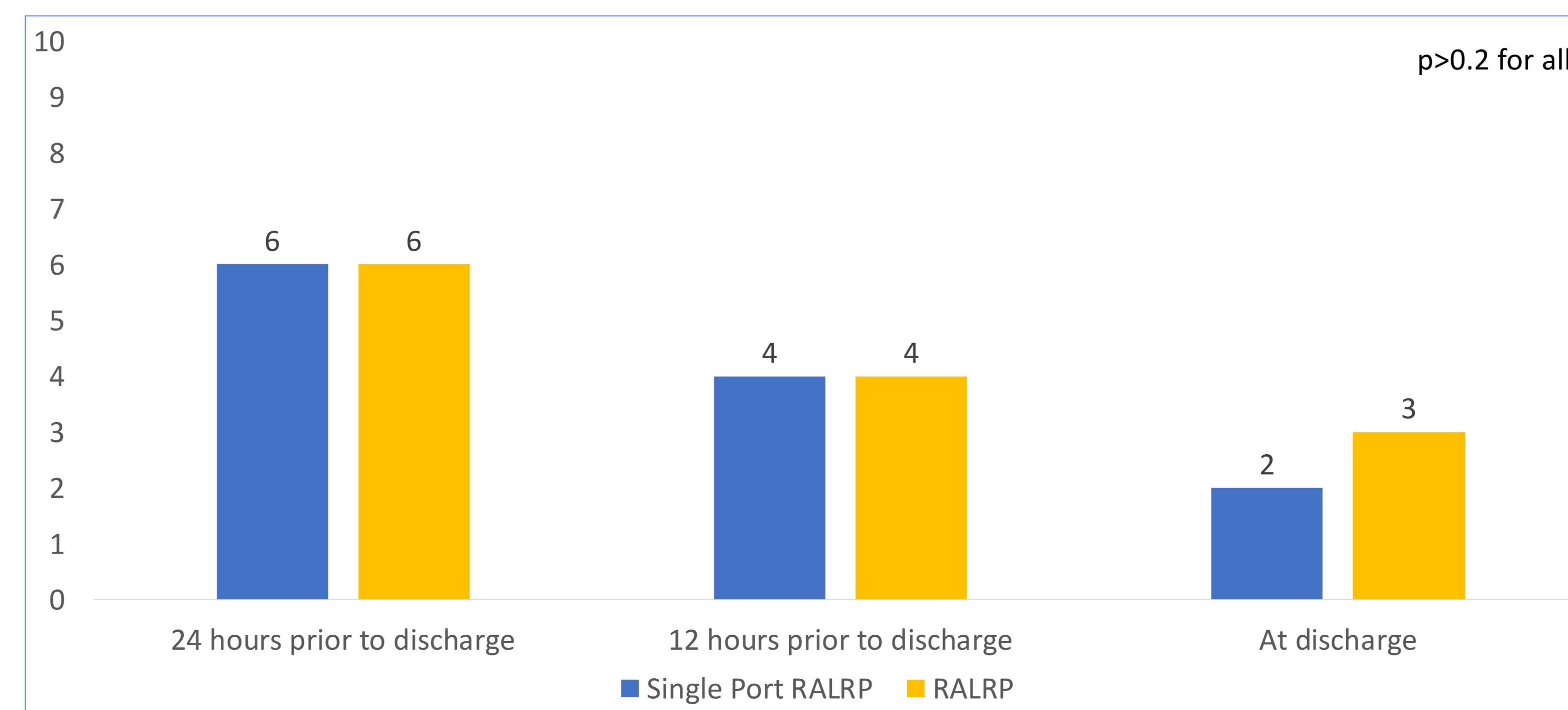
**Figure 2.** Rates of All Complications and Major Complications in SP-RALRP, Pooled SP, and Standard RALRP Cohorts



**Table 2.** Comparison of Pooled SP-RALRP Cohort to Single High-Volume RALRP Cohort

Mean (SD) or N (%)	Pooled SP-RALRP (n = 208)	Standard RALRP (n = 376)	P-value
Age (years)	62.7 (7.4)	61.3 (7.2)	0.05
PSA (ng/mL)	9.6 (7.8)	8.2 (8.8)*	0.09
Operative Time	203.2 (48.9)	186.5 (46.9)	<0.001
Estimated Blood Loss	173.6 (152.0)	181.9 (139.9)	0.51
PLND	151 (72.6)	312.0 (83.0)	0.003
LN Removed	9.6 (6.8)	11.7 (8.4)	0.02
Complications (Any)	27 (13.0)	65 (17.3)	0.17
Complications (Major, Clavien ≥III)	9 (4.3)	14 (3.7)	0.72
Positive Surgical Margins	65 (31.3)	92 (24.5)	0.08

**Figure 1.** Patient-Reported Pain Scores Around the Time of Discharge



\*One outlier with PSA>900ng/mL was excluded from analysis.

†There was a single major complication seen in the SP-RALRP cohort: delayed rectourethral fistula requiring a diverting colostomy and repair of the vesicourethral anastomosis.