

Course of urinary incontinence and comparison of pressure flow studies after Retzius-sparing RARP

Improvement in urodynamic parameters after surgery suggests that functional recovery of lower urinary tract dynamics may contribute to continence recovery in addition to anatomical preservation.

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Hypothesis / aims of study

Retzius-sparing RARP (RS-RARP), which involves a posterior approach to the prostate while preserving the Retzius space, was first reported by Galfano et al. in 2010 and was introduced at our institution in April 2020. Recent studies have suggested that RS-RARP may facilitate earlier recovery of urinary continence than conventional RARP. However, reports from Japan remain limited, and the factors associated with postoperative urinary incontinence after RS-RARP have not been fully elucidated. Therefore, this study aimed to investigate the factors associated with urinary continence recovery after RS-RARP by comparing the postoperative continence course with pressure-flow study (PFS) findings before and 6 months after surgery.

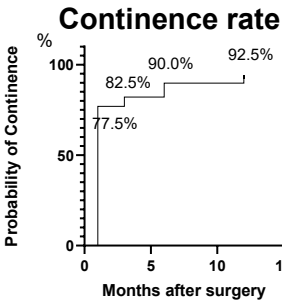
Study design, materials and methods

This prospective observational study included 40 patients who underwent RS-RARP at Nara Medical University Hospital between June 2020 and July 2025. Clinical and surgical parameters, including age, BMI, PSA, clinical T stage, NCCN risk classification, PV, MUL, console time, nerve preservation, lymph node dissection, and postoperative pad use, were recorded. PFS results before surgery and 6 months postoperatively were also compared. Urinary incontinence was assessed by the number of pads used at 1, 3, 6, and 12 months after surgery, with continence defined as the use of ≤ 1 pad/day.

Results

Patient's characteristics

RS-RARP (n = 40)	Median (IQR) or number
Age (year)	71.0 (64.0-74.0)
BMI (kg/m ²)	24.5 (22.7-26.1)
PSA (ng/mL)	6.4 (4.7-9.0)
Clinical T stage cT1 : cT2	13 : 27
NCCN Very low : Low : Intermediate favorable : Intermediate unfavorable : High : Very high	1 : 8 : 25 : 4 : 2 : 0
Prostate volume (mL)	30.7 (24.8-49.2)
Membranous urethral length (mm)	11.4 (9.5-13.6)
Console time (min)	164.0 (134.5-219.3)
Nerve sparing Yes : No	39 : 1
Surgical margin Positive : Negative	13 : 27
Lymph node dissection Yes : No	2 : 38



Detrusor overactivity

	DO+ 6 months after RS-RARP	DO- 6 months after RS-RARP	Total
DO+ before RS-RARP	3	9	12
DO- before RS-RARP	1	27	28
Total	4	36	40

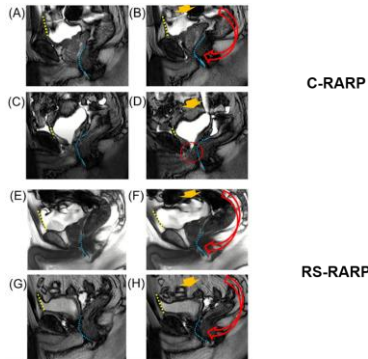
McNemar's exact test, p=0.011

Comparison of urodynamic studies

N = 40	Befroe RS-RARP	6 months after RS-RARP	P-value
First desire to void (mL)	156.0 (110.5-192.5)	155.0 (120.5-222.0)	0.1930
Normal desire to void (mL)	202.5 (160.3-269.0)	224.5 (168.0-267.5)	0.6021
Maximum cystometric capacity (mL)	303.5 (251.0-341.0)	303.0 (265.3-354.0)	0.9642
Compliance (mL/cmH ₂ O)	25.3 (10.2-36.4)	26.0 (14.1-52.7)	0.1933
Detrusor pressure at maximum flow (PdetQmax) (cmH ₂ O)	51.0 (41.5-71.0)	33.0 (24.8-40.3)	<0.0001***
Maximum urine flow rate (Qmax) (mL/s)	9.0 (5.8-11.3)	14.3 (11.5-17.2)	<0.0001***
Voided volume (VV) (mL)	292.0 (196.0-333.0)	299.0 (262.0-361.0)	0.0404†
Post-void residual urine volume (PVR) (mL)	0.0 (0.0-58.8)	0.0 (0.0-0.0)	0.0005***
Bladder outlet obstruction index (BOOI)	32.7 (21.7-53.7)	6.7 (-7.6-17.2)	<0.0001***
Bladder contractility index	96.5 (81.3-125.6)	104.8 (83.4-125.1)	0.5594
Maximum Watt factor	15.6 (11.6-23.8)	15.2 (9.9-26.3)	0.7093

Interpretation of results

Previous reports on the mechanism have focused primarily on anatomical studies using dynamic MRI, highlighting the importance of high fixation of the anterior bladder wall and the preservation of the mechanism for urethral closure during increased abdominal pressure.



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In C-RARP, improvements in Qmax and BOOI, as well as a reduction in involuntary bladder contractions, have been reported in urodynamic studies.

Parameters	Preop	Postop	Statistics
OABSS ^a			
Q1	0 (0, 1)	1 (0, 1)	0.284
Q2	2 (2, 3)	2 (1, 3)	0.330
Q3	1 (0, 3)	1 (0, 2)	0.026
Q4	0 (0, 1)	1 (1, 2)	0.007
Total	5 (3, 7.5)	4 (2, 8)	0.993
Urodynamic parameters ^b			
Qmax (mL/s)	7.8 (5.0, 10.0)	10.0 (7.1, 12.0)	0.001
Capacity (mL)	306.0 (248.0, 356.0)	287.5 (229.3, 340.8)	0.529
PVR (mL)	41.0 (17.0, 70.0)	22.5 (10.0, 56.0)	0.072
IDC (%)	6 (9.8)	3 (5.0)	0.001
Compliance (ΔmL/Δpr)	57.0 (44.0, 80.0)	57.5 (41.0, 80.0)	0.664
BOOI	36.0 (28.5, 53.3)	28.5 (15.0, 40.0)	<0.001
MUCP (cmH ₂ O)	110.0 (90.0, 143.8)	81.5 (70.0, 105.0)	<0.001
SUI	11 (18.3)	11 (18.3)	
Urinary BDNF/creatinine (ng/dL/ng/mL × 100) ^b	0.22 (0.15, 0.36)	0.21 (0.12, 0.28)	0.283
PSA (ng/mL)	7.83 (5.34, 12.27)	0.01 (0.01, 0.05)	<0.001

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Concluding message

RS-RARP provided favorable postoperative urinary continence outcomes in our cohort. These results suggest that postoperative continence recovery after RS-RARP may be related not only to preservation of periurethral supportive structures, but also to favorable changes in lower urinary tract function.