

MP19-13: The anterior urethrovesical angle measured on postoperative cystography can predict urinary incontinence after robot-assisted laparoscopic radical prostatectomy

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Abstract

Introduction: Robot-assisted laparoscopic radical prostatectomy (RALP) is associated with complications including urinary incontinence. And the urinary incontinence can be short-term and long-term. We evaluated early urinary continence in a set of consecutive patients who underwent conventional RALP (CON-RALP) and Retzius-sparing robot-assisted laparoscopic radical prostatectomy (RS-RALP) to identify the useful predictors of postoperative urinary incontinence as determined by postoperative cystography.

Materials and Methods: The final study consisted of 121 patients who underwent CON-RALP (n=61) and RS-RALP (n=60) for localized or local advanced prostate cancer. Postoperative cystography was performed within 7-10 days after RALP. The ratio between the horizontal and longitudinal length (H/L) of the bladder, the position of the urethrovesical junction (UVJ) quantitatively calculated by BNPS ratio, the anterior urethrovesical angle (aUVA), posterior urethrovesical angle (pUVA) as seen on the cystogram were evaluated. Postoperative continence status was defined by no pad or a safety pad usage after catheter removal. The association between these variables and urinary incontinence was then analyzed. All patients were followed for at least 3 months postoperatively.

Results: The demographic and intraoperative data showed no difference between these two groups. And the postoperative pathologic-related information like the T staging and surgical margin showed no significant difference. Postoperative cystographical parameters such as the aUVA, pUVA and H/L ratio showed statistical significance. Continence recovery rates of conventional RALP at 2 weeks, 1, 2 and 3 months were 14.8%, 19.7%, 34.4%, 62.3% respectively. And the continence recovery rate of RS-RALP at 2 weeks, 1, 2 and 3 months were 30.0%, 38.3%, 51.7%, 73.3%. The continence recovery rates differed significantly at 2 weeks, 1 and 2 months. On univariate analysis, patients' age, were independent risk predictors of urinary incontinence. In multivariate analysis, urinary incontinence was significantly associated with H/L ratio, nerve-sparing technique at 2 weeks. At 1 month, the urinary continence was significantly correlated with age, nerve-sparing technique, aUVA. The independent risk factors at 2 months included age, nerve-sparing technique, aUVA, BNPS ratio. The multivariate logistic regression analysis just showed aUVA was related to the urinary incontinence at 3 months postoperatively.

Conclusions: RS-RARP facilitate the recovery of early urinary continence after surgery. A larger aUVA measured on postoperative cystography is a useful and independent predictor for short-term urinary incontinence after RALP. Advanced age, nerve-sparing technique, larger aUVA, larger BNPS ratio, lesser H/L ratio will increase the risk of early urinary incontinence.

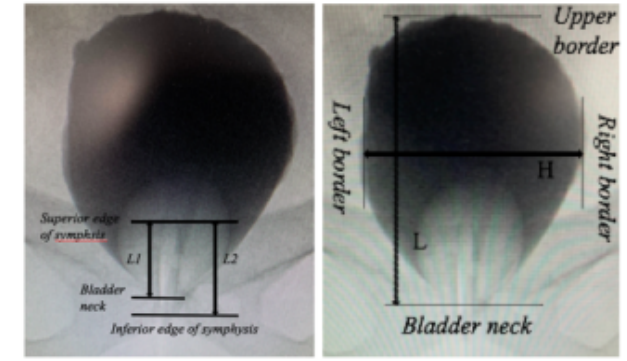


Figure 1: representative cystogram. L1=distance between bladder neck and superior edge of pubic symphysis, L2= length of pubic symphysis, BNPS ratio= L1/L2

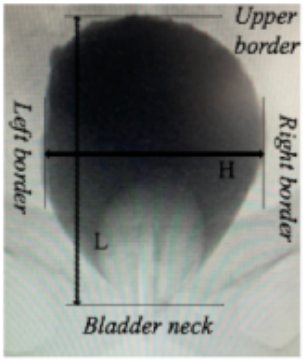


Figure 2: representative cystogram. L=longitudinal length of bladder, H= horizontal length of bladder H/L ratio= H/L

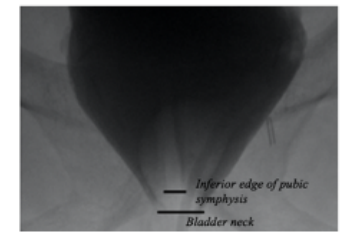


Figure 3

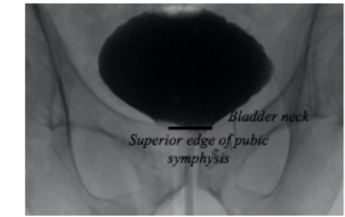


Figure 4

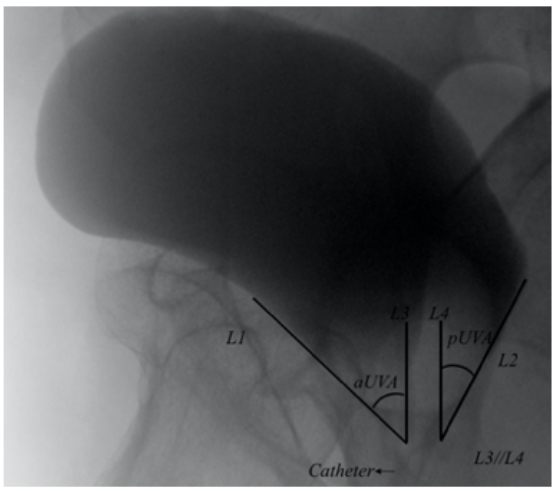


Figure 5

Figure 3: representative cystogram. Bladder neck is below the inferior edge of pubic symphysis. BNPS ratio >1

Figure 4: representative cystogram. Bladder neck is above or at the same level of the superior edge of pubic symphysis. BNPS ratio ≈0

Figure 5: representative cystogram. aUVA=anterior urethrovesical angle, pUVA=posterior urethrovesical angle. The L3 represents the outflow direction of urine. L3 is parallel to L4. L1 represents the tangent line of anterior wall. L2 represents the tangent line of posterior wall. The arrow indicates the Foley catheter.

Follow-up	2 w	1 m	2 m	3 m	2 w	1m	2 m	3 m
Parameters	Univariate OR (95% CI) P-value				Multivariate OR (95% CI) P-value			
Age (<69 vs. >69 y)	3.389 (1.308-8.776) P=0.012	3.158 (1.353-7.373) P=0.008	2.605 (1.237-5.488) P=0.012	1.419 (0.660-3.050) P=0.370	-	3.005 (1.023-8.827) P=0.045	2.469 (1.017-5.995) P=0.046	-
Procedure (CON-RARP vs. RS- RARP)	0.404 (0.165-0.991) P=0.048	0.394 (0.174-0.893) P=0.02	0.491 (0.236-1.021) P=0.05	0.601 (0.278-1.300) P=0.19	-	-	-	-
BMI (<23.9 vs. 24~26.9 vs. >27 kg/m ²)	P=0.90	P=0.48	P=0.62	P=0.53	-	-	-	-
Prostate volume (<32.5 vs. >32.5 ml)	2.372 (0.967-5.818) P=0.059	2.421 (1.069-5.483) P=0.034	1.112 (0.541-2.284) P=0.773	1.286 (0.599-2.762) P=0.518	-	-	-	-
IPSS (mild vs. moderate vs. severe)	P=0.12	P=0.09	P=0.57	P=0.06	-	-	-	-
ISUP grade (1 vs. 2 vs. 3 vs. 4. vs. 5)	P=0.210	P=0.161	P=0.287	P=0.404	-	-	-	-
Risk grade (low vs. mediate vs. high vs. local advanced)	P=0.139	P=0.152	P=0.223	P=0.061	-	-	-	-
Nerve-sparing (none vs. unilateral vs. bilateral)	P=0.000	P=0.000	P=0.001	P=0.050	P=0.000	P=0.003	P=0.014	-
aUVA	0.953 (0.917-0.991) P=0.016	0.946 (0.911-0.982) P=0.004	0.950 (0.917-0.983) P=0.003	0.958 (0.925-0.993) P=0.019	-	0.937 (0.911-0.963) P=0.022	0.946 (0.906-0.988) P=0.013	0.955 (0.916-0.955) P=0.029
pUVA	0.969 (0.936-1.004) P=0.08	0.961 (0.929-0.993) P=0.01	0.967 (0.938-0.998) P=0.03	0.961 (0.929-0.994) P=0.02	-	-	-	-
BNPS ratio (<0.78 vs. >0.78)	3.537 (1.365-9.164) P=0.00	4.012 (1.680-9.584) P=0.00	3.203 (1.506-6.811) P=0.00	2.149 (0.985-4.685) P=0.05	-	-	2.569 (1.007-6.550) P=0.04	-
H/L ratio (<0.90 vs. >0.90)	0.154 (0.054-0.443) P=0.001	0.226 (0.095-0.542) P=0.001	0.051 (0.007-0.354) P=0.003	0.438 (0.200-0.962) P=0.040	0.215 (0.052-0.889) P=0.034	-	-	-