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Original Article

Modified urethrovesical anastomosis during robot-assisted simple prostatectomy: Technique and results

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A B S T R A C T

Background: Despite significant developments in transurethral surgery for benign prostatic hyperplasia, simple prostatectomy remains an excellent option for patients with severely enlarged glands. The objective is to describe our results of robot-assisted simple prostatectomy (RASP) with a modified urethrovesical anastomosis (UVA).
Methods: From May 2011 to February 2014, RASP with UVA was performed in 34 patients by a single surgeon (O.C.) using the da Vinci S-HD surgical system. The UVA was performed between the bladder neck and urethral margin using the Van Velthoven technique. Demographic, perioperative, and outcome data were recorded. Complications were recorded with the Clavien–Dindo system.
Results: The mean (standard deviation) age was 68 years (62–74 years). The median preoperative prostate volume (interquartile range) was 117 cc (99–146 cc). Operative time was 96 minutes (78–126 minutes), estimate blood loss was 200 mL (100–300 mL), and two (5.8%) patients required a blood transfusion. No conversion to open surgery was needed. The median specimen weight on pathological examination was 76 g (58–100 g). The average hospital stay was 2.2 days (1–4 days) and average Foley catheter time was 4.6 days (4–6 days). No intraoperative complications were recorded. There were seven (20.5%) postoperative complications, most of them Clavien less than or equal to Grade II.
Conclusion: The results of our study show that RASP with UVA is a feasible, secure, and reproducible procedure with low morbidity. Additional series with larger patient cohorts are needed to validate this approach.

1. Introduction

With the development of new surgical techniques and energy sources, options for the endoscopic management of men with moderately enlarged prostates have widened over the past years. However, despite these advances, open simple prostatectomy (OSP) remains particularly well suited for patients with large glands (> 100 cc).[1] Newer options for minimally-invasive treatment of large glands include laparoscopic simple prostatectomy and holmium laser enucleation. While both of them showed comparable outcomes to the open approach,[2–4] they require a steep learning curve thus preventing wider acceptance among urologists. The robotic platform is an attractive alternative as it potentially overcomes these constraints by providing stereoscopic three-dimensional vision and exceptional dexterity to facilitate the more technically demanding steps of the simple prostatectomy procedure.[5] Robot-assisted simple prostatectomy (RASP) is a novel procedure not yet widely performed, even in high volume robotic centers with no more than a couple of hundred cases reported worldwide. With this paucity of information, the experience and results of high volume centers is still valuable.

The objective of this report is to describe our results with RASP in a contemporary cohort of men with lower urinary tract symptoms (LUTS) secondary to benign prostatic hyperplasia (BPH).

2. Materials and methods

Between May 2011 and February 2014, 34 patients with BPH-related LUTS underwent RASP by a single surgeon (O.C.). Peri-

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and intraoperative data were prospectively collected and retrospectively analyzed. Indications for surgery included LUTS refractory to medical treatment, urinary retention, and BPH-related consequences to the upper tract. Besides regular preoperative testing, all patients were specifically evaluated with digital rectal examination, prostate-specific antigen, renal and pelvic ultrasound, International Prostate Symptom Score (IPSS), and maximum urine flow (Q_{max}). Prostate cancer was ruled out with transrectal ultrasound-guided biopsies in patients with elevated prostate-specific antigen and/or abnormal digital rectal examination. Complications were classified with the Dindo–Clavien classification.[6]

2.1. Surgical technique

All of the procedures were performed by a single surgeon (O.C.) using the Da Vinci S-HD Surgical System (Intuitive Surgical, Sunnyvale, CA, USA).

2.1.1. Patient position and port placement

After induction, the patient was placed in a lithotomy position and a steep Trendelenburg position, over an antisliding foam with padding for all pressure points. Pneumatic compressors were used on the lower extremities to prevent postoperative deep venous thrombosis. We placed four trocars as follows: 12-mm camera port supraumbilically, two 8-mm robotic ports bilaterally on a line between the camera port and the iliac crest at least 9 cm from the camera port, and a lateral 12-mm port cranial to the right iliac crest for the assistant. Three robotic instruments were used: hot shears monopolar curved scissors, fenestrated bipolar forceps, and a large needle driver. A 0-degree camera was used throughout the whole procedure.

2.1.2. Bladder dissection and opening

Firstly, the median and medial umbilical ligaments were taken down giving full access to the preperitoneal space and prostate. The periprostatic fat was then completely removed to gain full access to the prostatic capsule and vesicoprostatic junction. An anterior opening was made in the bladder before the junction and continued distally along the prostatic capsule. Both edges of the bladder were then sutured to the Cooper's ligament at each side to achieve optimal visualization of the adenoma (Fig. 1).

2.1.3. Dissection of the adenoma

The ureteral orifices were identified first. The correct plane of dissection between the prostatic capsule and the adenoma was first identified circumferentially on both sides of the prostate. Dissection starts at the lower half of the contour with counter traction given by the assistant with the suction cannula (Fig. 2). Dissection then continued towards the anterior half. Finally, the catheter was identified at the apex and the urethra was sectioned under direct vision with care not to risk the sphincteric complex. The adenoma was collected in an endoscopic bag.

2.1.4. Modified urethrovesical anastomosis

After careful revision of hemostasia, a double-needle barbed suture was used to create a posterior urethorvesical anastomosis using the Van Velthoven technique. Being careful not to include the ureteral orifices, the posterior bladder neck and urethra were sown between Hour 3 and Hour 9 to create a halfway urethrovesical anastomosis (Fig. 3).

2.1.5. Bladder closure and postoperative care

A 22-Fr three-way Foley catheter was placed and the prostatic capsule and anterior bladder were sutured in a running fashion using a vicryl 2-0 suture. The bladder was then filled with 200 cc of saline to verify watertight closure. A percutaneous drain was left and bladder irrigation was started and left for 24 hours. Specimen was sent for pathological analysis.

2.2. Statistical analysis

Normally distributed quantitative data were summarized as means, and measures of variability were reported as standard deviations, whereas non-normally distributed data were summarized as median and variability reported as interquartile range (IQR). Qualitative data were reported as percentages. A Kaplan–Meier curve was designed to present changes in IPSS and Q_{max} after surgery.

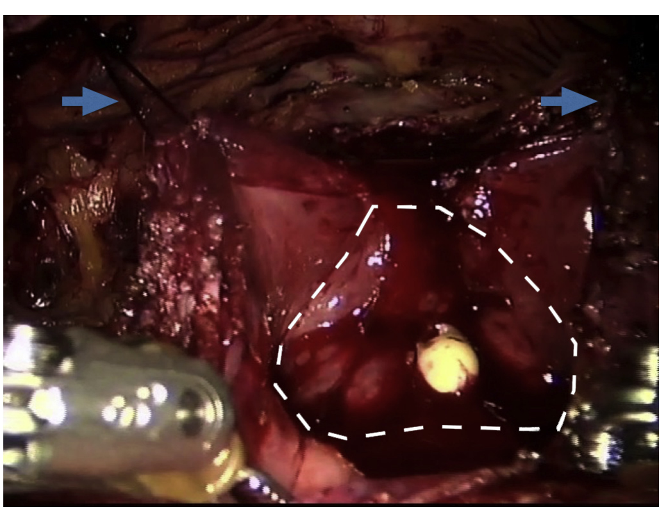

Fig. 1. A longitudinal incision was made in the bladder anteriorly and through the vesicoprostatic junction. The contour of the adenoma was then visualized (broken line). Stay sutures were placed on the lateral edges of the bladder (arrows) and then sutured to the Cooper's ligament at each side to achieve optimal visualization of the adenoma.

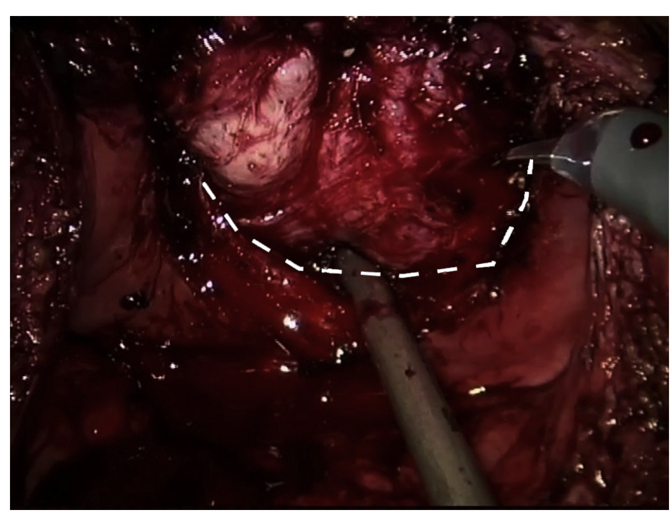

Fig. 2. Excision of the adenoma started at the lower half of the contour by identifying the plane between the adenoma and prostatic capsule (broken line), while the assistant gave counter traction with the suction cannula. Dissection was then continued anteriorly towards the apex. Finally, the urethra was incised under direct vision.