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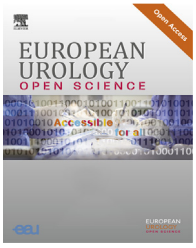

European Association of Urology

Surgery in Motion: Open Science

Retzius-sparing Robot-assisted Simple Prostatectomy: Perioperative and Short-term Functional Outcomes Assessed via Validated Questionnaires

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Abstract

Background and objective: Several surgical procedures have been reported for treatment of male patients with lower urinary tract symptoms (LUTS) secondary to large benign outlet obstruction (BOO). The diffusion of robotic surgery offers the possibility to perform open simple prostatectomy (SP) with a minimally-invasive approach. Our aim was to report outcomes of the Retzius-sparing robot-assisted SP (RS-RASP) technique.

Methods: This was a single centre, prospective study. Patients with LUTS secondary to BOO and a prostate volume of >100 ml underwent RS-RASP performed with a da Vinci surgical system in four-arm configuration for a transperitoneal approach. Data for intraoperative and perioperative complications were collected. Functional outcomes were assessed via validated patient questionnaires. Univariable and multivariable regression analyses were used to identify predictors of complications and achievement of a trifecta composite outcome.

Key findings and limitations: The median patient age was 69 yr and the median prostate volume was 150 ml. The median operative time was 175 min, with estimated blood loss of 350 ml. The median in-hospital stay and median catheterisation time were 3 d and 9 d, respectively. Within 90 d, the incidence of complications was 3% for grade 1, 19% for grade 2, and 2% for grade 3 complications. At 7-mo follow-up, statistically significant improvements in International Prostate Symptom Scores (total score and quality of life), International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form (ICIQ-UI SF) scores, and the maximum flow rate were observed (all $p < 0.0001$). According to ICIQ-UI SF scores, 20%, 6%, and 3% of the patients had slight, moderate, or severe urinary incontinence (UI), respectively. Urgency UI was experienced by 14% of the patients and stress UI by

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10%. Most of the patients with UI reported leakage of a small amount of urine and they did not wear pads.
Conclusions: RS-RASP was associated with good perioperative outcomes and a low prevalence of high-grade complications. Significant LUTS relief was achieved, but some patients experienced slight urgency or stress UI at short-term follow-up.
Patient summary: We explored a surgical technique called Retzius-sparing robot-assisted simple prostatectomy to treat men with bothersome urinary symptoms caused by a large prostate. The technique led to good results, with minimal bleeding and few complications during surgery. This surgery could be a beneficial choice for patients with stubborn urinary symptoms and a large prostate gland.

1. Introduction

Surgery remains the cornerstone of the management of male patients with non-neurogenic lower urinary tract symptoms (LUTS) suggestive of benign outlet obstruction (BOO) [1]. Many surgical techniques have been successfully developed, including resection, enucleation, vaporisation, alternative ablative techniques, and non-ablative techniques [1]. The choice of surgical technique depends on several factors, including prostate size, comorbidities, suitability for anaesthesia, patient preference, willingness to accept surgery-associated specific side effects, surgical techniques available, and surgeon experience with these techniques [1]. For prostate glands >80 ml, open simple prostatectomy (SP), holmium laser enucleation of the prostate (HoLEP), thulium enucleation, and bipolar enucleation are considered appropriate options for treatment.

Minimally invasive SP techniques, including pure laparoscopic SP (LSP) and, more recently, robot-assisted SP (RASP), have increased in popularity. A plethora of systematic reviews and meta-analyses have compared RASP to open SP or LSP and different endoscopic enucleation of the prostate (EEP) techniques [2–4]. Overall, the data suggest possible advantages for RASP over open SP in terms of the postoperative complication rate, length of stay (LOS), estimated blood loss (EBL), and transfusion rates. However, the European Association of Urology (EAU) guidelines still consider LSP and RASP as feasible options that are still under evaluation owing to the lack of high-quality efficacy and safety data [1].

Several different surgical techniques for RASP have been reported [5], including a transperitoneal or extraperitoneal approach and a transvesical or extravesical anterior approach to the adenoma. Leslie et al [6] reported a posterior transvesical approach involving transversal incision of the bladder dome without dropping it. By contrast, De Concilio et al [7] reported a single case of Retzius-sparing (RS) RASP in which the prostatic capsule was incised through the pouch of Douglas. Following our transition to an RS approach for robot-assisted radical prostatectomy, we

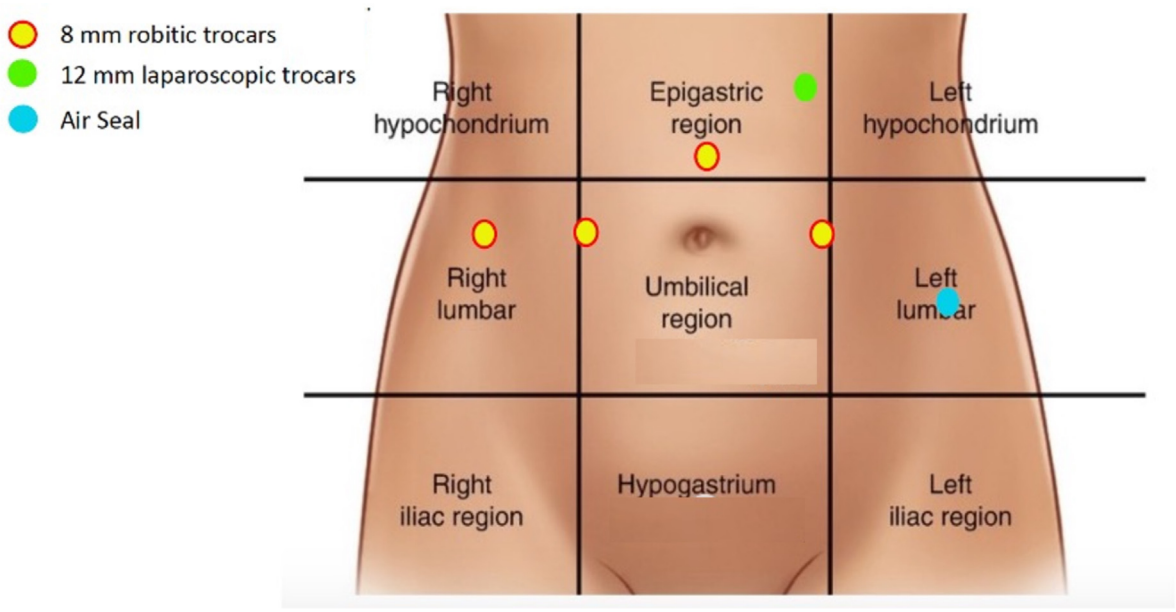


Fig. 1 – Trocar placement for Retzius-sparing robot-assisted simple prostatectomy.

elected to adopt a similar RS approach for RASP. Here we report our technique for RS-RASP for treatment of male patients with non-neurogenic LUTS suggestive of BOO and a prostate gland >100 ml and report perioperative and functional outcomes assessed using validated questionnaires.

2. Patients and methods

From March 2021 to April 2023, RS-RASP was performed by multiple surgeons on 87 consecutive patients. In accordance with the EAU guidelines [1], surgery was offered to patients with therapy-resistant LUTS suggestive of BOO, intolerance to medical therapies, acute or chronic urinary retention, bladder stones, bladder diverticula, recurrent urinary tract infections, or treatment-resistant macroscopic haematuria. RS-RASP was offered to patients with a prostate gland >100 ml.

2.1. Patient preparation

Bowel preparation was not performed. An early recovery after surgery protocol included early mobilisation, oral intake, and gastrointestinal stimulation with chewing gum. Antibiotic prophylaxis with third-generation cephalosporins was administered in all patients. Pharmacological prophylaxis for venous thromboembolism was only used in cases with specific indications, in accordance with the EAU guidelines [8], but elastocompressive stockings were used for all patients until hospital discharge.

2.2. Surgical technique

2.2.1. Patient positioning and port placement

All procedures were performed with a Si, X, or Xi da Vinci surgical system. The patient is placed in a 29° Trendelenburg position, head down. Foam-cushion table liners help to prevent the patient from sliding in this position. The legs are in stirrups with minimal hip flexion. The knees are flexed at a gentle 30°, and the legs are spread to accommodate the robotic surgical system. A four-arm configuration

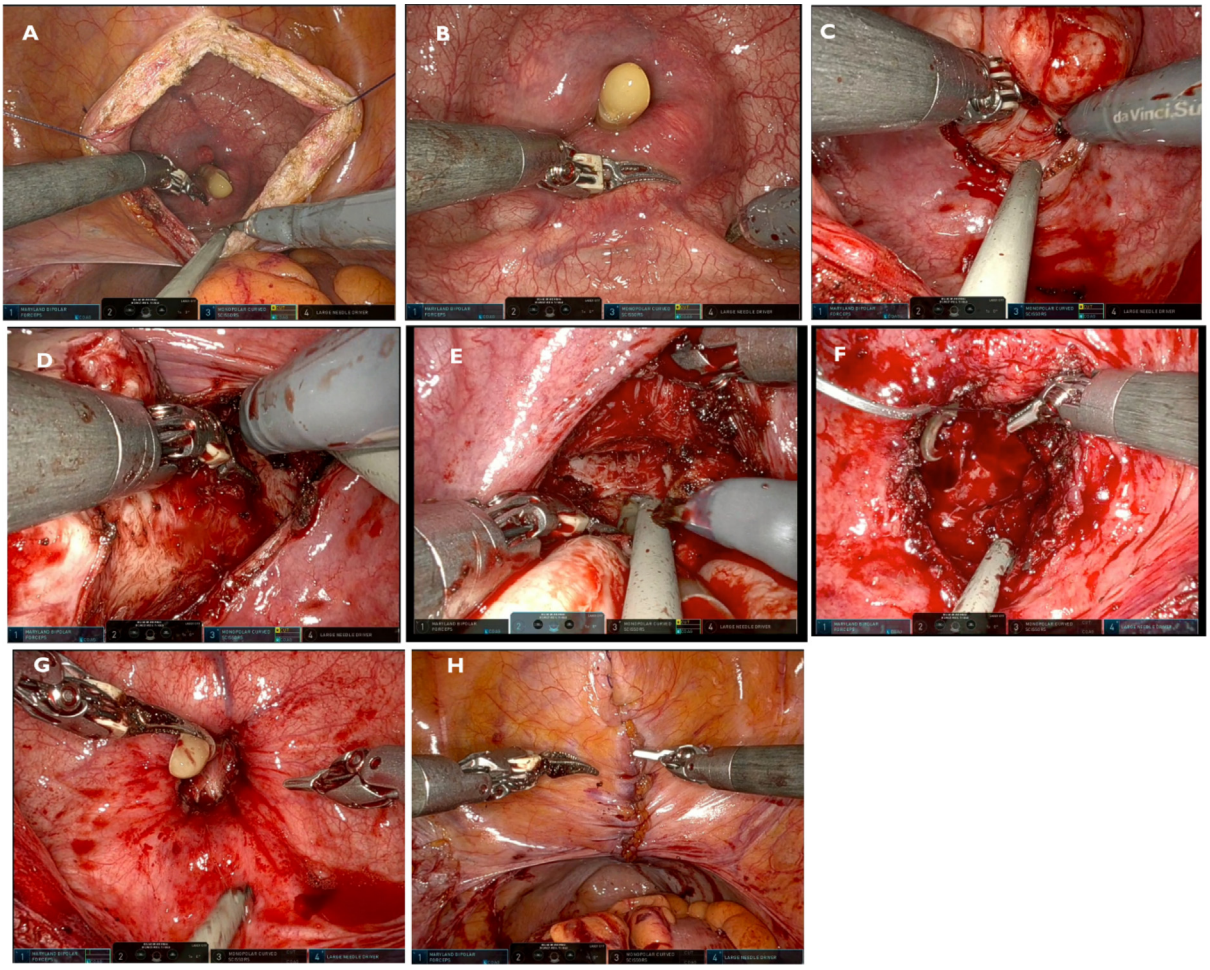


Fig. 2 – Surgical steps in Retzius-sparing robot-assisted simple prostatectomy. (A) Vertical incision of the posterior bladder wall and placement of two Vicryl 2-0 stay stitches to keep the bladder open during the entire procedure. (B) Location of the ureteric orifices. (C) Incision at the edge of the adenoma between the 4-o'clock and 6-o'clock positions to find the correct plane between the adenoma and the peripheral zone of the gland and initial posterior dissection. (D) Anterolateral dissection of the adenoma. (E) Anterior commissurotomy to ease final dissection of the adenoma. (F) Appearance of the prostatic bed after insertion of V-Loc 3-0 haemostatic sutures. (G) Appearance of the bladder neck after advancing the bladder neck mucosa to the prostatic apex. (H) Posterior bladder wall after double-layer Filbloc suturing.

was used in all cases, with the fourth arm in the right iliac fossa. All the procedures used one Maryland bipolar forceps, one Hot shears monopolar scissors, and one needle driver together with a 0° scope. An AirSeal flow system, placed in the left iliac fossa, was used in all the cases. A 12-mm assistant port was placed between arms 1 and 2 (Fig. 1).

2.2.2. Opening of the posterior bladder wall

The main peculiarity of our surgical technique is preservation of the Retzius space. Once the bladder is filled with 200 ml of saline via an indwelling catheter, access to the prostatic adenoma is achieved by a 6-cm vertical incision in the posterior bladder wall. Two Vicryl 2-0 stay stitches mounted with Hem-o-lok clips are used to anchor the bladder wall to the anterior abdominal wall and keep it open during the whole procedure (Fig. 2A).

2.2.3. Dissection of the adenoma

After entry into the bladder, the location of the ureteric orifices is identified (Fig. 2B) and an incision is made at the edge of the adenoma between the 4 o'clock and 6 o'clock positions to find the correct plane between the adenoma and the peripheral zone of the gland (Fig. 2C). This plane is developed bluntly and sharply, first posteriorly (Fig. 2D) and then anterolaterally on both sides of the prostate as far distally as possible without risking injury to the sphincteric complex. Stay stitches are not routinely used to provide traction on the adenoma. Haemostasis during the dissection can be achieved via monopolar or bipolar cautery. At this point, an anterior commissurotomy is performed, using incision with diathermy onto the urethral catheter (Fig. 2E). The adenoma is finally released, collected in an Endocatch bag, and placed in the left iliac fossa.

2.2.4. Haemostasis in the prostatic bed and retrigonisation

Haemostasis in the prostatic bed is achieved using one or two V-Loc 3-0 (Medtronic Italia, Milan, Italy) running sutures (Fig. 2F). The bladder neck mucosa is advanced to the prostatic apex, covering the whole prostatic bed, using a two-needle 3-0 Filbloc (Assut Europe, Magliano dei Marsi, Italy) running suture (Fig. 2G). Care is needed to avoid injury to the ureteral orifices in this step.

2.2.5. Closure of the posterior bladder wall

A final two-needle Filbloc 3-0 suture is used to close the posterior bladder wall incision in a double layer (Fig. 2E). A transurethral three-way Folatex catheter is left in place, with the balloon inflated with 5 ml of saline. The bladder is inflated with 300 ml of saline to check that the bladder suture is watertight. No drain is left in place.

2.3. Postoperative management

Bladder irrigation is left until the morning of the first postoperative day. Patients are discharged home once ambulating with clear urine output, and the urethral catheter is left in place. The catheter is removed in the outpatient clinic approximately 1 wk after discharge.

2.4. Data collection

All data were collected prospectively by medical staff. Preoperative data collected included age, gender, body mass index, American Society of Anesthesiologists score, Charlson comorbidity index, prior medical and surgical therapies for LUTS, prior prostate biopsy, and prostate-specific antigen (PSA) values. Perioperative data comprised operative time, EBL, perioperative transfusion rate, intraoperative complications, LOS, 90-d postoperative complications, and the readmission rate. Postoperative complications were classified using the Clavien-Dindo scheme [9]. and reported in accordance with the EAU recommendations for reporting complications [10].

Italian-validated translations of the American Urological Association symptom index [11], International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form (ICIQ-UI SF) [12], and International Index of Erectile Function (IIEF-5) [13] questionnaires were administered at baseline and during follow-up. Patients were asked how many pads they used during the day and at night. The severity of urinary incontinence (UI) was graded as suggested by Klovning et al [14]. Specifically, patients with an ICIQ-UI SF score of 0 were considered fully continent, while scores of 1–5, 6–12, 13–18, and 19–21 represented slight, moderate, severe, and very severe UI, respectively [14].

We also evaluated the trifecta composite outcome proposed by Autorino et al [15]: postoperative maximum flow rate (Q_{max}) >15 ml/s, International Prostate Symptom Scores (IPSS) <8, and absence of complications.

All procedures were in accordance with the ethical standards established in our country.

2.5. Statistical analysis

Results for continuous variables are reported as the median with interquartile range (IQR). Results for categorical variables were reported as the frequency and proportion. A Wilcoxon test was used to assess the change in continuous variables over time. Univariable and multivariable regression analyses were used to identify predictors of 90-d complications and trifecta achievement. Covariates with $p \leq 0.1$ in univariable analyses were included in the multivariable models. A two-sided p value ≤ 0.05 was considered statistically significant. All statistical analyses were performed with IBM SPSS for Macintosh version 28.0 (IBM Corp., Armonk, NY, USA).

3. Results

Table 1 summarises the characteristics of the 87 patients treated with RS-RASP. The median prostate volume on ultrasound was 150 ml (IQR 125–188). Most of the patients had previously received medical therapies for LUTS and the median IPSS was 17 (IQR 13–21). Some 30% of the patients had an indwelling catheter, and 15% had concomitant bladder stones.

Table 2 summarises the intraoperative and postoperative data. Approximately 20% of the patients underwent other concomitant surgical procedures. No intraoperative complication was observed. The median operating room time was

Table 1 – Clinical characteristics of the 87 patients treated with Retzius-sparing robot-assisted simple prostatectomy

Parameter	Result
Median age, yr (interquartile range)	69 (63–74)
Median body mass index, kg/m^2 (interquartile range)	26.3 (24.7–29.3)
Eastern Cooperative Oncology Group performance status 0, *n* (%)	45 (52)
American Society of Anesthesiologists class III, *n* (%)	10 (11)
Charlson comorbidity index >2, *n* (%)	37 (42)
Anticoagulant therapies, *n* (%)	18 (20)
Median preoperative PSA, ng/ml (interquartile range)	6.7 (4.1–9.5)
Median free PSA/total PSA ratio at baseline, % (interquartile range)	21 (15–28)
Median prostate volume on ultrasound, cm^3 (interquartile range)	150 (125–188)
Prior prostate biopsy, *n* (%)	32 (37)
Prior α-blocker therapy, *n* (%)	70 (80)
Median duration of α-blocker therapy, mo (interquartile range)	28 (7–68)
Prior therapy with 5α-reductase inhibitors, *n* (%)	20 (23)
Median duration of 5α-reductase inhibitor therapy, mo (interquartile range)	19 (6–57)
Prior anticholinergic therapy, *n* (%)	4 (4)
Median duration of anticholinergic therapy, mo (interquartile range)	19 (12–19)
Prostatic median lobe, *n* (%)	57 (66)
Indwelling catheter, *n* (%)	26 (30)
Concomitant bladder stones	13 (15)
Median duration of catheterization, mo (interquartile range)	5 (3–6)
Bladder diverticula, *n* (%)	2 (2)
Prior surgical therapies for LUTS/BOO, *n* (%)	3 (3)
Median baseline IPSS total score (interquartile range)	17 (13–21)
Median baseline IPSS quality of life score (interquartile range)	5 (4–5)
Median baseline ICIQ-UI SF score (interquartile range)	5 (1–10)
Median baseline International Index of Erectile Function-5 score (interquartile range)	16 (10–20)
Median maximum flow rate at baseline, ml/s (interquartile range)	11 (8–14)

LUTS/BOO = lower urinary tract symptoms suggestive of benign outlet obstruction; ICIQ-UI SF = International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form; IPSS = International Prostate Symptom Score; PSA = prostate-specific antigen

175 min (IQR 140–210), and median EBL was 350 ml (IQR 200–500). No conversion to pure laparoscopic or open surgery occurred.

The median LOS was 3 d (IQR 2–4) and the median postoperative catheterisation duration was 9 d (IQR 6–11). Two patients (2%) were readmitted after discharge for a complication related to RASP. A single patient had a lower urinary tract infection and a transient ischaemic attack; another patient experienced paralytic ileus that was treated conservatively (both grade 2 complications). A third patient was hospitalised 2 mo after RASP to treat a kidney stone that was considered unrelated to the RASP procedure.

Within 90 d, we observed 23 complications in 21 patients (24%), of which only 2% were grade 3 complications. Supplementary Table 1 summarises all the complications observed.

Supplementary Table 2 summarises univariable and multivariable regression results for predictors of postoperative complications. Only body mass index was associated with the occurrence of postoperative complications (odds ratio 1.2; $p = 0.04$).

The median weight for fixed RASP specimens was 72 g (IQR 47–117) and final histology confirmed the presence of benign prostatic hyperplasia in 90% of the cases.

Figure 3 summarises the functional results at follow-up. At median follow-up of 7 mo (IQR 3–14) there was a statistically significant improvement in all the outcomes evaluated (all $p < 0.001$) exception for the IIEF-5 score, which was unchanged. Specifically, ~67% of the patients experienced mild symptoms according to IPSS results, but most of the patients experienced storage symptoms, with a median IPSS storage subscore of 4 (IQR 2–8).

Table 3 details results for the ICIQ-UI SF questionnaire. Complete continence was achieved by 71% of the patients, whereas 20%, 6%, and 3% experienced slight, moderate, and severe UI, respectively. The vast majority of the patients with leakage reported leaking about once a week or less often (question 3) and leakage of a small amount of urine (question 4). According to question 6, 15% of the patients reported urgency UI (UUI) and 10% reported stress UI (SUI). The vast majority of the patients did not wear pads (median number 0, IQR 0–0).

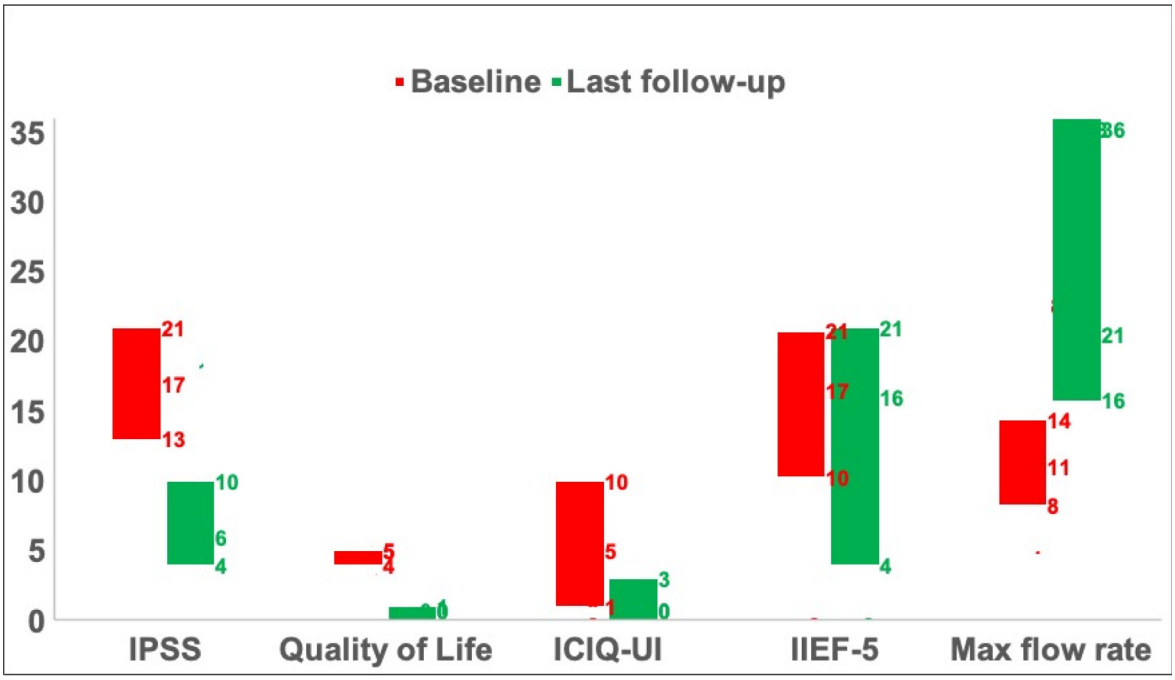
Median PSA value at follow-up was 0.6 ng/ml (IQR 0.2–1.3), which was significantly lower than the baseline value ($p < 0.0001$). At follow-up, the trifecta composite outcome (postoperative Q_{max} >15 ml/s, IPSS <8, and absence of complications) was achieved in 47 patients (54%).

Supplementary Table 3 summarises univariable and multivariable regression results for predictors of trifecta achievement. Body mass index and Eastern Cooperative Oncology Group performance status had borderline statistical significance on univariable analysis ($p = 0.05$) but no variable was significant on multivariable analysis.

At latest follow-up, one patient underwent transurethral resection for bladder neck sclerosis; a second patient had a

Table 2 – Intraoperative and perioperative data for the 87 patients treated with Retzius-sparing robot-assisted simple prostatectomy (RASP)

Parameter	Result
Median operative time, min (interquartile range)	175 (140–210)
Concomitant surgical procedures, *n* (%)	
– Bladder stone removal	13 (15)
– Bladder diverticulectomy	2 (2)
– Hydrocelectomy	2 (2)
– Inguinal hernia repair	3 (3)
Median estimated blood loss, ml (interquartile range)	350 (200–500)
Intraoperative transfusion, *n* (%)	1 (1)
Intraoperative complications, *n* (%)	0
Median in-hospital stay, d (interquartile range)	3 (2–4)
Median time to catheter removal, d (interquartile range)	9 (6–11)
Post-operative complications, *n* (%)	
– Grade 0	66 (76)
– Grade 1	3 (3)
– Grade 2	16 (19)
– Grade 3	2 (2)
– Grade 4 or 5	0
Postoperative transfusion, *n* (%)	1 (1)
Median weight of the fixed RASP specimen, g (interquartile range)	72 (47–117)
Final histology for the RASP specimen, *n* (%)	
– Benign prostatic hyperplasia	79 (90)
– Incidental Gleason 6 prostate cancer	4 (5)
– Stromal tumour of uncertain malignant potential	4 (5)



Variables	Baseline	Follow-up	P values
Median IPSS total score (IQR)	17 (13 – 21)	6 (4 – 10)	<0.001
Median IPSS Quality of life (IQR)	5 (4 – 5)	0 (0 – 1)	<0.001
Median ICIQ-UI SF score (IQR)	5 (1 – 10)	0 (0 – 3)	<0.001
Median IIEF-5 score (IQR)	16 (10 – 20)	16 (4 – 21)	0.6
Median maximum flow rate at uroflowmetry (ml/sec) (IQR)	11 (8 – 14)	21 (16 – 36)	<0.001

Fig. 3 – Functional results for the 87 patients treated with Retzius-sparing robot-assisted simple prostatectomy. ICIQ-UI SF = International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form; IIEF = International Index of Erectile Function; IPSS = International Prostate Symptom Score; IQR = interquartile range.

diagnosis of fossa navicularis stricture, for which home self-dilatation was suggested after outpatient dilatation.

4. Discussion

We report results after RS-RASP for treatment of male patients with non-neurogenic LUTS suggestive of BPO and a prostate gland >100 ml. We observed good perioperative outcomes, with low EBL and transfusion rates, low prevalence of high-grade postoperative complications, and significant LUTS relief.

A plethora of surgical techniques have been developed for the treatment of male non-neurogenic LUTS suggestive of BOO, including resection, enucleation, vaporisation, alternative ablative techniques, and non-ablative techniques [1]. Choice of the ideal surgical technique depends on several factors, including prostate size, comorbidities, suitability for have anaesthesia, patient preference, and willingness to accept side effects. Not surprisingly, especially in the case of large prostates, the availability of different technologies and the surgeon's experience with them can play a significant role in treatment selection. Specifically, in the case of prostates >80 ml, open SP, HoLEP, thulium enucleation, and bipolar enucleation are considered appropriate options for treatment according to the EAU guidelines [1]. Several systematic reviews and meta-analyses have compared the different surgical techniques for treatment of large adenomas, including RASP, open SP, LSP, and EEP techniques [2–4]. Overall, the data available suggest possible advantages with RASP over open SP regarding postoperative complication rates, LOS, EBL, and transfusion rates. Conversely, it has been suggested that RASP and LSP are associated with similar outcomes, although LSP needs considerable laparoscopic expertise, which is unlikely to be broadly available owing to the diffusion of robotic platforms [2]. EEP was associated with better LOS, catheterisation times, and transfusion rates in comparison to RASP [2–4]. Regardless of the comparison with EEP, which is beyond the scope of the present study, RASP could be an attractive surgical technique for extremely large glands, in cases with concomitant conditions such as bladder stones and diverticula, and in cases

Table 3 – Urinary continence results for the 87 patients treated with Retzius-sparing robot-assisted simple prostatectomy

ICIQ-UI SF question and possible responses	Patients, *n* (%)
Urinary incontinence severity	
– Full continence (score 0)	62 (71)
– Slight incontinence (score 1–5)	17 (20)
– Moderate incontinence (score 6–12)	5 (6)
– Severe incontinence (score 13–18)	3 (3)
Question 3. How often do you leak urine?	
– Never	62 (71)
– About once a week or less often	17 (20)
– About once a day	5 (6)
– Several times a day	3 (3)
– All the time	–
Question 4. How much urine do you usually leak (whether you wear protection or not)?	
– None	62 (71)
– A small amount	22 (26)
– A moderate amount	3 (3)
– A large amount	–
Question 5. Overall, how much does leaking urine interfere with your everyday life?	
– 0	70 (80)
– 1	11 (13)
– 2	3 (3)
– 3	1 (1)
– 6	1 (1)
– 7	1 (1)
Question 6. When does urine leak?	
– Never	62 (71)
– Before you can get to the toilet	12 (14)
– When you cough or sneeze	5 (6)
– When you are asleep	–
– When you are physically active/exercising	4 (5)
– When you have finished urinating and are dressed	1 (1)
– For no obvious reason	3 (3)
– All the time	–
Pads used per day	
– 0	75 (86)
– 1	11 (13)
– >1	1 (1)

ICIQ-UI SF = International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form.

for which EEP techniques are not unavailable [4,16]. Moreover, RASP could also offer advantages in terms of a shorter learning curve and a lower risk of postoperative storage symptoms [17,18].

In our hands, RS-RASP provided good perioperative and functional results. Our technique is different from many of the transvesical approaches to the adenoma reported in the literature because we do not drop the anterior bladder wall or open the Retzius space, similar to the study by Leslie et al [6]. However, we do not enter the bladder via an incision in the dome, but through the posterior wall, which, in our experience, offers a favourable working angle. It is unclear to what extent results are associated with preservation of the Retzius space. A small retrospective study comparing Retzius-sparing and standard RASP demonstrated similar results [19]. Overall, data for our series are in line with the best findings reported in the literature [15,20–27]. Notably, we observed a higher prevalence of low-grade complications, which may be associated with accuracy of our data collection and the high methodological quality of our study. Conversely, the number of high-grade complications was extremely low, in line with the literature. However, a non-negligible number of patients reported postoperative storage LUTS, including some with UUI and SUI. Storage symptoms are infrequently reported following RASP, although they are prevalent following EEP. Fuschi et al [18] reported that approximately 13% of patients experienced storage LUTS (defined as burning/pain, urgency, and increased urinary frequency not associated with urinary tract infection) following minimally invasive SP, in comparison to 33% of patients treated with HoLEP. The IPSS storage subscore and the prevalence of UUI we observed in our series reconfirm that storage symptoms might also occur following RASP. UI has been sporadically reported following RASP [24,27], with extremely low prevalence, which also reduces over follow-up. Specifically, Wagaskar et al [27] reported that 44%, 20%, and 12% of their patients used pads at 6-wk, 3-mo, and 6-mo follow-up, respectively. In our series, 14% of the patients used pads at 7-mo follow-up, and 20%, 6%, and 3% experienced slight, moderate, or severe UI, respectively, according to the ICIQ-UI SF questionnaire. Although UUI was more common in our series, a few patients experienced SUI (again, mainly slight). It is possible that this might be attributable the learning curve for the procedure, considering that the operations were performed by several robotic surgeons with differing prior robotic expertise. Although data following RASP are sparse, it is reasonable that urinary continence in these patients might improve over time, similar to what happens following radical prostatectomy. We will follow these patients with particular interest.

Our study is important for several reasons. We presented detailed data according to the current EAU standard for reporting of complications [10]. Moreover, we used validated questionnaires to report functional outcomes. Overall, we believe that we have provided sufficient details so that the surgical technique is reproducible and the results are of good methodological quality. Moreover, the procedures were performed by several surgeons with varying robotic expertise, demonstrating quick and easy adoption of the technique by our team and, possibly, external reproducibility. However, the study is not devoid of limitations. First, our series is small and the patients were well selected. Second, the series includes cases from the team's learning curve for the procedure. However, according to data reported by Johnson et al [28], 10–12 cases is sufficient to reach a plateau in blood loss and tissue yield. However, more cases could be needed to optimise functional outcomes of the procedure. Moreover, our follow-up duration is short, and functional outcomes could change over time. Finally, we did not use a technique aimed at preserving ejaculatory function, as reported by Simone et al [21] and Porpiglia et al [24], and we did not use questionnaires to evaluate ejaculatory function. However, preservation of ejaculation was not a frequent request from our patients, maybe because of their age and the high prevalence of prior treatments with a significant impact on ejaculatory function.

5. Conclusions

We reported our initial experience with RS-RASP. We observed good perioperative outcomes, with limited EBL, a low transfusion rate, and low prevalence of high-grade

complications. Functional results demonstrated significant LUTS relief, but a significant percentage of patients experienced slight UUI and, less frequently, SUI at short-term follow-up.

Author contributions: Giacomo Novara had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Study concept and design: Novara, Dal Moro.
Acquisition of data: Parisotto, Brunetti, Serbia, Lami, Zanovello.
Analysis and interpretation of data: Novara, Zattoni, Dal Moro.
Drafting of the manuscript: Novara.
Critical revision of the manuscript for important intellectual content: All authors.
Statistical analysis: Novara, Zattoni.
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Supervision: Zanovello, Dal Moro.
Other: None.

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Appendix A. Supplementary data

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