

Is Retzius-sparing robot-assisted laparoscopic radical prostatectomy effective in early continence? A single-center experience of the first 50 patients

Kayhan Yılmaz , Çağatay Özsoy , Mahmut Taha Ölçücü , Eren Erdi Aksaray , Yahya Okuducu , Mutlu Ateş 

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ABSTRACT

Objective: In this study, we aimed to present the perioperative and postoperative outcomes and early continence rates of the first 50 patients who underwent Retzius-sparing robot-assisted laparoscopic radical prostatectomy (RS-RALP) in our clinic for prostate adenocarcinoma.

Material and methods: Between December 2018 and December 2019, 50 patients who underwent RS-RALP by 2 surgeons in our clinic were enrolled in the study. Preoperative, perioperative, and postoperative clinical data were analyzed retrospectively. Procedure-specific complications were graded according to the Clavien-Dindo classification. The continence status of the patients was recorded in the 1st week, 1st month, and 3rd month after catheter removal. Zero pads or 1 safety pad per day was accepted as total continence.

Results: The mean age of the patients was 66.6 (57–75) years. According to the D’Amico classification, 36% of patients were at low risk, 48% at intermediate risk, and 16% at high risk. Bilateral or unilateral nerve-sparing procedure was performed in 76% of the patients. There were no intraoperative complications. A total of 9 (18%) patients had a postoperative complication (7 with grade 1, 1 with grade 2, and 1 with grade 3 complications). Whereas 32% of the patients had an extraprostatic extension, 22% had seminal vesicle invasion. The overall positive surgical margin rate was 26%. At 1 week, 1 month, and 3 months after surgery, 64%, 80%, and 92% of men who underwent RS-RALP were continent, respectively.

Conclusion: Our study showed that this new surgical technique can be a safe and feasible method because high rates of early continence were achieved in the patients who underwent RS-RALP without increasing the risk of complications.

Keywords: Prostate cancer; Retzius sparing; robot-assisted laparoscopic radical prostatectomy; urinary continence.

Introduction

Radical prostatectomy (RP) is the most widely used method for treating prostate cancer today.^[1] The purpose of RP is to provide a full cure in cancer treatment while preserving the urinary and sexual functions.^[2] Previous studies have shown that urinary continence is one of the crucial factors for quality of life and treatment satisfaction after RP.^[3,4] Damage to the urinary sphincter, endopelvic fascia, and puboprostatic ligaments can be considered the primary causes of urinary incontinence.^[4] These structures are more likely to be damaged in the anterior approach robot-assisted laparoscopic radical pros-

tatectomy (A-RALP) techniques.^[5] The technical advances preserving normal anatomy could improve postoperative functional results.^[6] Recently, the technique of Retzius-sparing robot-assisted laparoscopic radical prostatectomy (RS-RALP) has been described; it allows for a complete intrafascial approach, avoiding all the Retzius structures involved in continence preservation.^[7] More than 90% of the patients reached urinary continence immediately, rendering the procedure highly promising.^[7] However, the main limitation of the RS-RALP technique is the worldwide lack of experience and consequent low popularity compared with A-RALP technique described at the begin-

Department of Urology,
University of Health Sciences,
Antalya Training and Research
Hospital, Antalya, Turkey

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Corresponding Author:
Kayhan Yılmaz
E-mail:
kyhn_79@hotmail.com

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ning of this millennium.^[8,9] Another limitation of RS-RALP that may prevent it from gaining popularity is the relatively small working space it provides compared with the conventional non-Retzius Sparing Surgery (RSS) technique, a pitfall that may be critical in case of enlarged or firmly attached prostates.^[10]

In this study, we aimed to present the early continence rates and perioperative and postoperative findings of our first 50 patients with prostate cancer who underwent RS-RALP to demonstrate the applicability of RS-RALP despite the limitations stated in the literature and also to show the utility of the Rocco stitch in this technique.

Material and methods

A total of 50 patients who underwent RS-RALP surgery by 2 surgeons at our clinic, between December 2018 and December 2019, were enrolled in the study. Considering the learning curve, the first 5 cases of both the surgeons were excluded from the study. Patients with a history of urinary incontinence were also excluded from the study. All patients underwent multiparametric magnetic resonance imaging before the surgery to assess the extraprostatic spread and seminal vesicle invasion. Skeletal scintigraphy was performed to exclude bone metastases.

Age, body mass index (BMI), clinical stage, risk groups according to the D'Amico classification, biopsy Gleason scores, latest pre-operative prostate-specific antigen levels, and prostate volumes were recorded as the fundamental patient demographics and clinical characteristics. The basic steps of the RS-RALP surgical technique applied in our study were similar to those of the technique described by Galfano et al.^[7,11] In addition to this standard technique, the Rocco stitch, which is used in the anterior approach, was also used in the RS method. We found that the urethral length increased after RS-RALP surgery, the anastomosis was performed easy and decreased anastomotic tension (Figure 1 and 2).

Surgical technique

Our RS-RALP technique was similar to that described by Galfano et al.^[7,11] The patients were first laid in a steep Trendelenburg posi-

tion. A horizontal incision was made over the peritoneum in the rectovesical space slightly above the level of the vas deferens. The vas deferens was mobilized and clipped bilaterally. The plane between the seminal vesicles and surrounding tissues was developed, and any vessels identified were clipped. Subsequently, the seminal vesicles and the vas deferens were both pulled upward using the grasper. The avascular plane between the Denonvilliers' fascia and the posterior prostatic fascia was developed with the aid of the suction by the assistant. The dissection was advanced intrafascially upward to the prostatic apex, preserving the neurovascular bundle. The bilateral prostate pedicles were then dissected by entering the plane between the prostate capsule and the lateral prostate fascia. Considering the various possible reported anatomies of the neurovascular bundle, a combination of a sharp and a blunt dissection was performed following the curve of the prostate. Any vessels encountered along the way were clipped and divided. The dissection was made distally until the lateral aspect of the urethral and

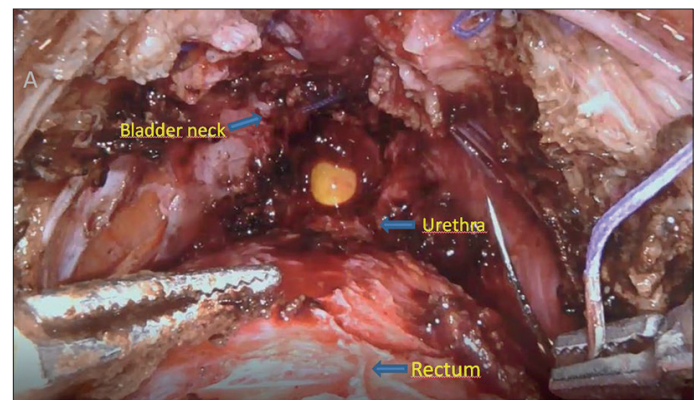


Figure 1. View of the surgical area before the Rocco stitch

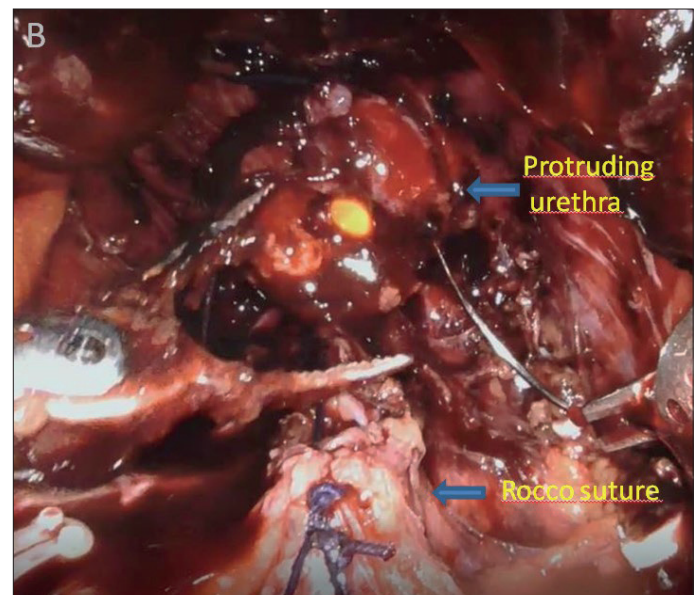


Figure 2. View of the surgical area after the Rocco stitch

Main Points:

- Retzius-sparing robot-assisted laparoscopic radical prostatectomy technique is a safe and feasible method to achieve continence soon after surgery, without increasing the risk of complications.
- We postulate that the improved early continence rate is mainly attributable to the minimization of surgical trauma and tissue retraction associated with this technique.
- The limited space can result in disadvantages, especially in men with large prostates.

the dorsal venous complex (DVC) was visible. At this stage, the posterior and lateral aspects of the prostate were freed. After recognizing, isolating, and sectioning the vesicoprostatic junction, the anterior surface of the prostate was separated from DVC. The urethra was incised when the apex was completely isolated. After the prostate was removed, the Rocco stitch, which is used in the anterior approach, was used in addition to the standard RS technique to increase the urethral length (Figure 1 and 2). Vesicourethral anastomosis was performed using a running suture from the 12-o'clock position. In patients with a high risk of prostate cancer, extended lymph-node dissection was performed.

Procedure-specific complications were graded according to the Clavien-Dindo classification.^[12] The pathology specimens were processed and analyzed according to the 2014 International Society of Urological Pathology recommendations.^[13] The oncological results were evaluated using the positive surgical margins (PSMs) in the pathology specimens. Hospital stay and removal of the urethral catheter times were recorded. The patient's continence status was recorded in the 1st week, 1st month, and 3rd month after catheter removal. Zero pads or 1 safety pad per day was accepted as total continence. The ethics committee of our hospital approved this study and waived written informed consent given the retrospective nature of this study.

Table 1. Patient demographics and clinical characteristics (n=50)

Characteristic	Patient data
Age, y, mean (IQR)	66.6 (57–75)
BMI, kg/m ² , mean (IQR)	26.6 (20.2–36.9)
PSA, ng/mL, median (IQR)	8.7 (2.4–55)
PV, g, mean (IQR)	55.6 (24–163)
Clinical stage, n (%)	
T1c	39 (78)
T2a–T2b	5 (10)
≥T2c	6 (12)
Biopsy Gleason score, n (%)	
3+3	25 (50)
3+4	15 (30)
4+3	3 (6)
≥8	7 (14)
D'Amico, n (%)	
Low risk	18 (36)
Intermediate risk	24 (48)
High risk	8 (16)

IQR: interquartile range; BMI: body mass index; PSA: prostate-specific antigen; PV: prostate volume

Statistical analysis

Data were analyzed using Microsoft Excel (10.0, Microsoft Corporation, USA). Quantitative data were represented as median (interquartile range) and qualitative data as frequency and percentage.

Results

The mean age of the patients was 66.6 (57–75) years, and the mean BMI was 26.6 (20.2–36.9) kg/m². The biopsy Gleason scores were 3+3 for 25 (50%) patients, 3+4 for 15 (30%) patients, 4+3 for 3 (6%) patients, and ≥8 for 7 (14%) patients. When the clinical stage was examined, 39 (78%) patients were cT1c, 5 (10%) were cT2a–T2b, and 6 (12%) were cT2c. According to the D'Amico classification, 18 (36%) patients were at low risk, 24 (48%) were at intermediate risk, and 8 (16%) were at high risk (Table 1).

The bladder neck was preserved in all patients, except in 2 patients with a prostate volume of >150 g. A bilateral or unilateral intrafascial nerve-sparing procedure was performed in 38 (76%) patients. Lymph-node dissection was performed in 23 (46%) patients. Postoperative complications developed in 9 patients; 3 of these were clinically insignificant lymphoceles, whereas 4 were anastomosis leaks that were resolved with mild penile traction on the 1st day after surgery. Only 1 patient had a perioperative blood transfusion. Patients were discharged, on average, 4 days

Table 2. Perioperative and postoperative outcomes (n=50)

Outcome	Results
Consol time, min, mean (IQR)	236.4 (120–430)
In-hospital stay, d, mean (IQR)	3.7 (3–5)
Catheterization time, d, mean (IQR)	8.2 (8–9)
Nerve sparing, n (%)	
Yes (bilateral or unilateral)	38 (76)
No	12 (24)
Lymph-node dissection, n (%)	
Yes	23 (46)
No	27 (54)
Anastomosis time, min, mean (IQR)	33.7 (20–50)
Clavien-Dindo classification, n (%), detail	
Grade 1	7 (14), lymphocele (3), anastomosis leakage (4)
Grade 2	1 (2), blood transfusion (1)
Grade 3	1 (2), unilateral hydronephrosis requiring nephrostomy tube placement (1)
Grade 4	0
Grade 5	0

IQR: interquartile range

after surgery. The urethral catheters were removed, on average, on the 7th day after surgery (Table 2).

The pathological features of the patients are given in Table 3. Prostate cancer metastasis was detected in 8 (33.3%) of the 24 patients who underwent lymph-node dissection. The number of patients with biopsy Gleason scores $\geq 3+4$ was 25 (50%), whereas this number was 34 (68%) in the pathology specimens, and a higher grade was detected in 36% of patients.

The use of 0 pads or 1 safety pad per day was accepted as total continence. The patients were called for polyclinic visits in the 1st week, 1st month, and 3rd month after catheter removal. A total of 64%, 80%, and 92% of men who underwent RS-RALP had

reached total continence at 1 week, 1 month, and 3 months after surgery, respectively (Table 4).

Discussion

Urinary incontinence and time interval between surgery and total continence are important problems for patients after RP.^[14,15] Although the long-term continence results are good in the A-RALP method, the early postoperative urinary incontinence described as urinary incontinence in the first 2–6 months after surgery still remains a challenge to be resolved.^[4,16,17] Hence, various techniques have been proposed for the optimal preservation of the anterior compartment anatomy, thus providing anatomical support and stabilization for the urethra, as well as tension-free anastomosis and posterior support to the external sphincter, such as bladder neck protection,^[18] posterior reconstruction of the rhabdosphincter,^[19] preservation of the puboprostatic ligaments,^[20] or a combination of both anterior and posterior reconstructions.^[21] However, despite all these techniques, it is inevitable that the supporting structures, such as the endopelvic fascia and puboprostatic ligaments, will be damaged by pulling down the bladder.^[10] This resulted in a new technique that preserves the Retzius area during RALP.^[11] High rates of early continence were reported in this new technique developed by Galfano et al.^[7] Unlike the retropubic access path used in the traditional anterior technique, in the RS-RALP technique, the prostate is reached through the Douglas pouch. Thus, important anatomical structures that are believed to play a role in continence, such as the puboprostatic ligaments, the DVC, the arcus tendinous fascia, the endopelvic fascia, Aphrodite's veil, and the detrusor apron are preserved.^[6,7,11,22] In addition, blood loss is minimal in this approach because the Santorini plexus is not damaged. Some small arteries and accessory pudendal arteries entering the Santorini plexus are also protected in this approach.^[14]

Galfano et al.,^[7] who first described the RS-RALP technique, reported that when continence was defined as 0–1 pad per day in the 1st week, the early continence rate was 90%, and when continence was defined as 0 pads per day, the rate was 76%. Although the surgeons in this study had not previously been trained in the Retzius protective technique (first described in 2010), they reported higher rates of early continence than the standard technique. Dalela et al.^[11] reported that RS-RALP resulted in an earlier recovery of urinary continence and reduced urinary-function-associated discomfort compared with A-RALP. In this study, it was shown that 71% of patients undergoing RS-RALP were continent in the 1st week after urethral catheter removal, and the continence rates increased to 83% and 95% in the 1st and 3rd months, respectively. For A-RALP, these values were 48%, 67%, and 86% in the 1st week, 1st month and 3rd month after surgery, respectively. In a study conducted by Lim et al.,^[22] 70% of the patients who underwent RS-RALP were shown to

Table 3. Pathological outcomes (n=50)

Outcome	Results
Gleason score, n (%)	
3+3	16 (32)
3+4	24 (48)
3+5	2 (4)
4+3	6 (12)
4+4	2 (4)
Pathological stage, n (%)	
$\leq pT2$	28 (56)
$\geq pT3$	22 (44)
Extraprostatic extension, n (%)	
Yes	16 (32)
No	34 (68)
Seminal vesicle invasion, n (%)	
Yes	11 (22)
No	39 (78)
Positive surgical margin, n (%)	
$\leq pT2$	5 (17.8)
$\geq pT3$	8 (36.3)
Lymph node positive	
Yes	8 (34.7)
No	15 (65.3)

Table 4. Urinary continence outcomes after catheter removal (n=50)

Outcome	Patient data
1 week, n (%)	32 (64)
1 month, n (%)	40 (80)
3 months, n (%)	46 (92)

be completely dry in the 1st month, and 92% did not use any pads or used only 1 safety pad per day. It was reported that by using any surgical changes (RS-RALP), they achieved the highest continence rates they had ever achieved. In our study, when continence was defined as using 0 pads per day, the continence rates were 44%, 62%, and 80% at 1st week, 1st month, and 3rd month, respectively. When the use of 0 pads and 1 safety pad per day was accepted as continence, these rates were 64%, 80%, and 92%, respectively. Our results were compatible with those in the previous literature.

Dalela et al.^[1] found similar complication rates when comparing RS-RALP and the anterior approach (12% in standard RALP versus 18% in RS-RALP), and lymphocele (requiring percutaneous drainage) was the most common complication (9 of 120 in both groups; 7.5%). Santok et al.^[23] reported a 5% complication rate in a large series of 294 cases. The complication rates in our study (18%) were slightly higher than those reported in the literature. We think that the reason for this is that we have published the first 50 cases we performed with the RS-RALP method, which is a challenging surgical technique.

Galfano et al.^[7] found a PSM of 15% for pT2 and 45% for pT3 in the oncological results of 200 patients who underwent RS-RALP, and they concluded that the Retzius protective approach is oncologically safe. Sayyid et al.^[24] reported results similar to the results of Galfano et al (17% and 47%, respectively). In the study conducted by Dalela et al.,^[1] PSM rates (13%–25%) were higher in the posterior arm but were not statistically significant. In our study, the PSM rates were 17% for pT2, 36% for pT3, and 26% overall. Our findings show that RS-RALP produces satisfactory oncological results, care should be taken in the selection of patients, especially of those suffering from advanced prostate cancer.

This study had some limitations. We defined urinary incontinence as the use of pads reported by the patients, which is not an objective quantitative measurement method. Another limitation of this study is that owing to the short patient follow-up period, we could not yield erectile function and long-term oncological results. However, in a recent study, when the erectile function results between the 2 methods were compared, it was shown that there were no statistically significant differences in 3 month (36.7% for A-RALP versus 43.7% for RS-RALP) and 12 month (69.2% for A-RALP versus 86.5% for RS-RALP) results.^[25] In the same study, when considering the biochemical recurrence-free survival rates, these were 92.7% for A-RALP and 91.4% for RS-RALP at 12 months, and there was no significant difference.

In conclusion, our study showed that the RS-RALP technique could be a safe and feasible method because high continence rates were achieved in the early period (1–3 months) without in-

creasing the risk of complications. Further studies should preferably be carried out with a prospective, multicenter, randomized design to improve the existing evidence for this new approach.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of University of Health Sciences, Antalya Training and Research Hospital (approval number: 2020-176, received date: 18/06/2020).

Informed Consent: Data extraction from database did not require consent from patients because no data were patient-related information.

Peer-review: Externally peer-reviewed.

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