Nerve Sparing Endoscopic Extraperitoneal Radical Prostatectomy—Effect of Puboprostatic Ligament Preservation on Early Continence and Positive Margins

Jens-Uwe Stolzenburga,*, Evangelos N. Liatsikosb, Robert Rabenalt a, Minh Do a, George Sakelaropoulos c, Lars Christian Horn d, Michael C. Truss e

a Departments of Urology, University of Leipzig, Liebigstraße 20, 04103 Leipzig, Germany
b Department of Urology, University Hospital of Patras, Greece
c Department of Medical Physics, University Hospital of Patras, Greece
d Departments of Pathology, University of Leipzig, Liebigstraße 20, 04103 Leipzig, Germany
e Department of Urology, Klinikum Dortmund, Germany

Abstract

Introduction: A technical modification of nerve sparing endoscopic extraperitoneal radical prostatectomy (nsEERPE) with preservation of the puboprostatic ligaments is presented and compared to a previous technique.

Materials and methods: nsEERPE was performed in 100 men with clinically localized adenocarcinoma of the prostate from March 2004 through February 2005. Patients were divided into two groups: Group A included patients in whom a standard nsEERPE was performed (n = 50), and group B included patients in whom a puboprostatic ligament sparing nsEERPE was performed (n = 50). The postoperative follow-up was 2 weeks and 3 months evaluating preliminary effects on early continence and positive margins.

Results: The early return to continence at 2 weeks postoperatively was achieved by 6 patients (12%) in group A, and 12 patients (24%) in group B. Three months after the procedure 24 (48%) and 38 (76%) patients were continent, in groups A and B respectively. Clinical outcome (early continence) was significantly better for Group B patients, at 2 weeks (chi-square test, p = 0.0019) and at 3 months (chi-square test, p = 0.0347) following surgery. No cases of complete or severe incontinence (more than 5 pads/day) were observed at 3 months after surgery, in either groups. Groups A and B did not exhibit significant differences regarding their histological status. In group A, positive margins were detected in...
1. Introduction

Laparoscopic radical prostatectomy (LRP) has been established in the literature as a valid therapeutic option for the management of organ confined cancer of the prostate. Amelioration of laparoscopic equipment and continuously evolving physician training has expanded its application throughout numerous urologic centers in the world [1–9].

Surgical technique improvement and increasing expertise have significantly reduced postoperative morbidity compared with previous reports in the literature. Nevertheless, postoperative urinary continence and surgical margin status remain to be critical issues. Thus, the development of technical modifications need to be judged in the light of these issues [1–9].

The published rate of postprostatectomy (laparoscopic or not) urinary incontinence ranges from 6% to 47% [10–12]. Guilloneau et al. and Türk et al. reported complete continence rates after six months of 76% and 86%, respectively [3,13]. One year after the procedure continence rates have a further ameliorating trend. Nevertheless, early return to continence is becoming of increasing importance to the patient and doctor. Various technical modifications have been suggested to improve postoperative incontinence, including bladder neck preservation and/or various methods of apical dissection. Various investigators have suggested the prominent role of puboprostatic ligaments in the maintenance of postprostatectomy continence, by supporting the urethra in maintaining its position in the pelvic floor. Therefore, the “non laparoscopic” literature is continuously enriched with technical modifications aiming to mimic normal anatomy. Thus, some advocate the placement of a stitch ligating the dorsal vein complex to the symphysis pubis, while others preserve the puboprostatic ligaments before apical resection [10,14–16]. Nevertheless, skepticism exists by some authors who advocate the incision of the puboprostatic ligaments to reduce positive margin rates. Katz et al. have showed a reduction of apical positive margin rates from 12.1% in 1998 to 6.1% in 2001 [17]. One of their modifications was the incision of the puboprostatic ligaments. Nevertheless, the same authors attribute this positive margin rate reduction mainly to the meticulous dissection at the apex, facilitated by the enhanced laparoscopic view. In addition, they make reference to the possible positive effect of the increasing experience with the procedure during time. Others do not shear their experience [10,16].

Based on the existing experience with preservation of puboprostatic ligaments during retropubic radical prostatectomy, we herein present a laparoscopic technical modification of endoscopic extraperitoneal nerve sparing radical prostatectomy (nsEERPE) that enables ligament preservation, and compare it with standard nsEERPE. The present study was performed to determine whether the suggested technique provided reduction of the mean time to continence.

2. Materials and methods

Nerve sparing endoscopic extraperitoneal radical prostatectomy was performed in 100 consecutive men with clinically localized adenocarcinoma of the prostate from March 2004 through February 2005. Patients were divided into two groups: Group A included patients in whom a standard nsEERPE was performed \((n = 50)\), and group B included patients in whom a puboprostatic ligament nsEERPE modification was performed \((n = 50)\). T1c and T2a patients were included in the study, and their Gleason score did not exceed 6. The mean age was 60.8 years (range: 43 to 74) and 60.4 (range: 41–73) for groups A and B, respectively. The mean preoperative serum prostate-specific antigen (PSA) value was 7.1 ng/mL (range: 2.4 to 21) and 7.9 ng/mL (range: 1.1 to 19) for groups A and B, respectively. The mean prostate weight as evaluated by transrectal ultrasonography was 50.2 g (range: 20–117) and 47.1 g (range: 28–81) for groups A and B, respectively.

Three patients in group A and 1 in group B, had a history of prior transurethral resection of the prostate. Twenty two patients in group A had (unilateral hernioplasty: 5, unilateral hernioplasty with mesh placement: 1, bilateral hernioplasty: 1, appendectomy: 15), and 7 in group B (unilateral hernioplasty: 3, appendectomy: 4), reported previous pelvic surgery.

6.5% and 26.3% of patients with pT2 and pT3, respectively. In group B, positive margins were found in 3.2% and 15.8% of patients with pT2 and pT3, respectively. **Conclusion:** We propose the use of puboprostatic ligament-sparing nsEERPE as an intriguing method to ascertain recuperation of early continence after nerve sparing procedures, without hindering the final oncological outcome. © 2005 Elsevier B.V. All rights reserved.
Concomitant pelvic lymph node dissection was performed in 6 and 11 patients of groups A and B, respectively with the following indications: PSA > 10 ng/ml and/or Gleason sum > 6 or G3 tumor. Simultaneous unilateral inguinal hernia repair with mesh placement into the preperitoneal space was performed in 2 and 5 patients of groups A and B, respectively.

The technique of nsEERPE has been previously described in detail [8]. In group A, the standard nsEERPE technique was performed.

In group B, we performed the following technical modification. Initially, a small incision of the endopelvic fascia was performed (Fig. 1A), facilitating the ligation of the Santorini plexus. The entire endopelvic fascia was not incised as performed in previously described nsEERPE techniques (B). Bilateral sharp incision of periprostatic fascia is performed caudally from the bladder neck toward the apex, medially to the puboprostatic ligaments, developing the appropriate plane (C). The prostate is dissected leaving integral the periprostatic fascia, the puboprostatic ligaments and the nerve bundles as a continuous structure (D). (Pb: pubic bone, p: prostate, bn: bladder neck, nbv: neurovascular bundles, pl: puboprostatic ligaments, pf: periprostatic fascia, v: vein, bl: bladder, ef: endopelvic fascia, sp: Santorini plexus).

Concomitant pelvic lymph node dissection was performed passed under the ligaments and over the Santorini plexus from right to left. The needle was guided from left to right in the plane below the dorsal venous complex and above the anterior urethral wall just caudal to the puboprostatic ligaments taking care not to touch the urethra. This maneuver allowed for plexus ligation without involvement of the puboprostatic ligaments (Fig. 1B). Starting from the medial plane of the ligaments a bilateral sharp incision was performed caudally toward the bladder neck (Fig. 1C) and a plane was then developed between the prostate and its thin overlaying fascia. The main goal was to develop the right plane and finally detach the prostate from its “envelopment” leaving intact the periprostatic fascia, the puboprostatic ligaments and the nerve bundles as a continuous structure (Fig. 1D). The dissection and incision of the prostate as well as the vesicourethral anastomosis should be performed very cautiously avoiding to entrap the bundles and/or the ligaments, thus jeopardizing the final outcome (Fig. 2A–D).
When the prostate was completely freed and dissected from its surrounding structures, it was then placed in an endoscopic retrieval bag. The bag was positioned in the left iliac fossa and the anastomosis was performed. Finally, the endoscopic bag was retracted through the 12 mm trocar at the end of the procedure (Fig. 3).

The postoperative follow-up was 2 weeks and 3 months evaluating preliminary effects on early continence. Questionnaires were mailed to the patients with a 100% return rate. There was no direct contact (i.e. telephone interview) between the staff and the patients. Continence was evaluated based on the number of pads per day, i.e. continence: maximum 1 pad/day, minimal stress incontinence: 2–3 pads/day, moderate stress incontinence: 4–5 pads/day, and incontinence: more than 5 pads/day. Postoperative pathologic classification was performed according to the 2002 TNM classification.

2.1. Statistical analysis

Performing multiple significance tests can introduce a probability of erroneously rejecting the null hypothesis much larger than the initial significance level. We therefore adopted the multivariate method of graphical models. Using this method, we can check whether the results obtained so far regarding the identification of (conditional) dependence relationships among the main variables of the problem (group membership, outcome and histological status) are valid.

According to this method, a graph is formed, consisting of various nodes. Each node represents a variable of the given domain. The presence of connecting lines (undirected edges) between the nodes can be interpreted in terms of conditional independence between them.

Starting from the saturated model (Table 1) that represents the model of no independence between any two nodes, we performed statistical significance tests in order to examine whether a simpler model could fit the data within acceptable limits. The tests were based on the Bayesian Information Criterion (BIC) score, which takes into consideration the quality of fit as well as the model's complexity. This procedure, called backward selection, attempts to delete existing edges, in a consecutive manner. Each resulting model's BIC score is compared with the score of the adopted model of the previous test. The process ends when no significant reduction of BIC score is achieved and the model chosen best fits the data.

Fig. 2 – Plane developed between the prostate and its thin overlaying fascia (A). Urethral catheter within the empty prostatic fossa prior to the anastomosis. Note the intact peri-prostatic fascia in continuity with the puboprostatic ligaments (B). The anastomosis is initiated (C) and at conclusion there is a distinct “supporting” mechanism adhering the anastomotic site to the pubic bone (D). (p: prostate, bn: bladder neck, nvb: neurovascular bundles, pl: puboprostatic ligaments, pf: peri-prostatic fascia, c: urethral catheter, u: urethra).
Table 1 shows the final model. The Group membership is independent of both histology status and outcome.

### 3. Results

The overall mean operating time, including lymphadenectomy and hernia repair when needed, was 132 min (range: 70–230) and 152 min (range: 75–280) in groups A and B, respectively. No conversion was deemed necessary and only one patient in group A required a transfusion (2 units of blood). The mean catheterization time was 5.5 days (range: 3–10) and 5.5 days (range: 4–14) in groups A and B, respectively.

There were no intraoperative complications in group A patients; in group B, one case of intraoperative injury of the ureteral crest and both ureteral orifices was encountered. Bilateral double pigtail stents were inserted and reconstruction of the bladder neck was performed. The urethral and ureteral catheters were removed 6 days and 3 weeks postoperatively without any need for further therapeutic manipulation.

No anastomotic leak that would extend catheterization time (longer than 14 days) was encountered in both groups. One patient in group A developed urosepsis treated conservatively with intravenous administration of antibiotics.

One patient in group A required an immediate reintervention due to postoperative bleeding, and was managed endoscopically. One patient in group B

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**Table 1 – Statistical model**

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<thead>
<tr>
<th>Histology</th>
<th>Outcome</th>
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<th>Outcome</th>
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<td>Group</td>
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<td>Group</td>
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The initial saturated model

Model: [gho], BIC=370.43

The best model using backward selection with BIC score

Model: [g, bo], BIC=357.61

Fig. 3 – Depiction of final trocar placement. The endoscopic retrieval bag containing the prostate is advanced within the left iliac fossa during the performance of the vesicourethral anastomosis. The anastomosis is thus safe, there is no interaction with the prostate and there is no risk of tumor cell spreading. The bag is finally retracted through the 12 mm trocar site at the end of the procedure.
developed symptomatic lymphocele within one month postoperatively and required percutaneous drainage. No late reinterventions were required in both groups.

The early return to continence (maximum 1 pad per day) at 2 weeks postoperatively was achieved by 6 patients (12%) in group A, and 12 patients (24%) in group B. Three months after the procedure 24 (48%) and 38 (76%) patients were continent, in groups A and B respectively. Furthermore, 30% of patients in group A, and 54% of patients in group B had minimal stress incontinence (2–3 pads per day) 2 weeks postoperatively. During the 3 month follow up 34% and 18% of patients presented minimal stress incontinence in groups A and B, respectively. Moderate stress incontinence (4–5 pads per day) 2 weeks after the operation. Moderate stress incontinence was reduced during the 3 month follow up to 18% in group A and 6% in group B. Complete or severe incontinence (>5 pads per day) was observed in 3 patients (6%) and 3 patients (6%), of groups A and B respectively. No cases of complete or severe incontinence were observed 3 months after surgery, in either groups (Table 2).

Clinical outcome (continence) was thus significantly better for patients belonging to Group B, at 2 weeks (chi-square test, df: 14.96–3, \( p = 0.0019 \)) and at 3 months (chi-square test, 8.623–3, \( p = 0.0347 \)) following surgery (Table 3).

Groups A and B did not exhibit significant differences regarding their histological status. In group A, positive margins were detected in 6.5% and 26.3% of patients with pT2 and pT3, respectively. In group B, positive margins were found in 3.2% and 15.8% of patients with pT2 and pT3, respectively (Table 4). No significant difference was observed between the two groups regarding the frequency of positive margins, even though there was a trend towards lower positive margins in group B. For the purpose of testing whether pathological tumor stage and surgical margin status were independent or not, we re-grouped histological findings into crude groups pT2 and pT3 (Table 1). The corresponding test indeed exhibited the strong dependence between them (Fisher’s test, \( p = 0.019 \)).

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<tr>
<th>Table 2 – Continence</th>
<th>2 weeks p.o.</th>
<th>2 weeks p.o.</th>
<th>3 months p.o.</th>
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<td>Group A (%)</td>
<td>Group B (%)</td>
<td>Group A (%)</td>
<td>Group B (%)</td>
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<tr>
<td>Continent (max. 1 pad/day)</td>
<td>6 (12%)</td>
<td>12 (24%)</td>
<td>24 (48%)</td>
<td>38 (76%)</td>
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<td>Minimal stress incontinent</td>
<td>15 (30%)</td>
<td>27 (54%)</td>
<td>17 (34%)</td>
<td>9 (18%)</td>
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<tr>
<td>Moderate stress incontinent</td>
<td>26 (52%)</td>
<td>8 (16%)</td>
<td>9 (18%)</td>
<td>3 (6%)</td>
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<tr>
<td>Incontinent (&gt; pads/day)</td>
<td>3 (6%)</td>
<td>3 (6%)</td>
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<th>Table 3 – Confidence intervals of clinical (continence) outcome</th>
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<tr>
<td>Difference</td>
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<td>Lower limit</td>
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<td>06/50 vs. 12/50</td>
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<td>15/50 vs. 27/50</td>
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<th>Table 4 – Pathology-positive margins</th>
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<td>Group A (n = 50)</td>
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<td>Positive margin (R1)</td>
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<tr>
<td>pT2a</td>
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<td>pT2b</td>
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<td>pT2c</td>
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<td>pT3b</td>
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4. Discussion

Laparoscopic radical prostatectomy has been rapidly established as a safe and effective treatment for the management of prostate cancer in specialized urologic centers [1–9,18]. Urologists are on a continuous search for development of technical modifications and/or refinements, that would reduce morbidity and ameliorate clinical and quality of life outcome. Continence, erectile function, and oncologic outcome are becoming of paramount importance for the contemporary laparoscopist. Thus nerve-sparing approaches have emerged as well as techniques for bladder neck reconstruction and urethrovesical anastomosis [18].

There is no concurrence in the literature regarding the nomenclature of the prostate’s adjacent fascias, and regarding the level of dissection for a nerve sparing procedure. Walsh advocates that the neurovascular bundle is located between the 2 layers of the lateral pelvic fascia (levator fascia-lateral layer, prostatic fascia-medial layer), and that during nerve sparing procedures the prostatic fascia should remain on the prostate [19]. Nevertheless, Menon et al. described their robotic experience and showed that the neurovascular bundles are enclosed within the layers of the periprostatic fascia. The layers of the periprostatic fascia merge with the anterior layers of Denovilliers’ fascia lateral to the prostate forming a triangular space. The three walls of the triangular space are formed by the inner layer of the periprostatic fascia (prostatic fascia-medial vertical wall), the outer layer of the periprostatic fascia (levator fascia-lateral wall), and the anterior layer of Denovilliers’ fascia (posterior wall). In addition, when performing a nerve sparing procedure they incise the periprostatic fascia anterior and parallel to the neurovascular bundles [20]. We tend to adhere more to the Mennon and McCarthy and Catalona nomenclature [20–21].

The responsible mechanisms for male pre- and postprostatectomy urinary continence are addressed in the literature, but various authors do not concur to a definite conclusion. Damage to the pelvic floor and/or external urethral sphincter musculature, and loss of anterior urethral support, have all been reported to lead to various degrees of postoperative incontinence. Age is an additional factor that needs to be considered as a predisposing factor of incontinence [22–26].

Controversy exists over the role of preserving the puboprostatic ligaments and the return to continence. Young first suggested that puboprostatic ligaments support the bladder neck and promote urinary continence after radical perineal prostatectomy [27]. Other authors have since stressed the importance of a urethral suspensory mechanism for urinary continence after radical retropubic prostatectomy. They concur that the ligaments are part of a larger urethral suspensory mechanism that attaches the membranous urethra to the pubic bone and ascertains continence. In addition, others have showed that continence rates correlate with differences in the mean functional urethral length and the existing differences in the maximal urethral closure pressure postprostatectomy [28–31]. Poore et al. reported an earlier return of continence with a puboprostatic ligament-sparing technique versus a nonsparing technique, but equivalent final outcomes [10]. Other authors are also advocates of the later technique reporting encouraging results [28–31]. We believe that during mobilization of the prostate and especially during apical dissection the intactness of the urethral supporting structures are of paramount importance since it avoids shear stress to the urethra as well as possible denervation.

To our knowledge, the herein presented manuscript is the first study in the literature to assess the effect of preservation of the puboprostatic ligaments during nsEERPE on postoperative early continence. We observed a significant reduction in the time to early continence after urethral catheter removal in those patients who underwent puboprostatic ligament-sparing nsEERPE (2 weeks and 3 months). Nevertheless, we did not observe any cases of incontinence 3 months after surgery, in either groups. In addition, in group B the entire endopelvic fascia was not incised as performed in previously described nsEERPE techniques. We believe that the respect to the perirethral supporting tissue is responsible for the recovery of early continence in the puboprostatic ligament sparing group, as consolidated by our findings.

The final oncological outcome of radical prostatectomy should always be considered when evaluating new techniques. Most investigators agree that the prostatic apex is the most frequent site of positive postprostatectomy margins. The margin rate for open radical prostatectomy (pT2 cancer) ranges from 7.8% to 27%. When reviewing the laparoscopic prostatectomy series, the pT2 positive margin rate range from 8% to 29% [32]. In the present manuscript the pT2 positive margin rates were 6.5% for the standard nsEERPE group and 3.2% for the puboprostatic ligament nsEERPE modification group. In addition, the pT3 positive margin rates were 26.3% and 15.8%, for groups A and B respectively. Nevertheless, we did not show any significant difference between the two groups regarding the frequency of positive margins. The low positive
margin rates in group B may possibly be attributed to the precise anatomical dissection of the dorsal venous plexus and apex without “bulging” ligatures of the dorsal vein plexus. The use of laparoscopic magnification allows better visibility of all anatomic structures and facilitates their precise dissection, thus respecting the anatomy of the prostatic fossa and its adjacent tissues. Nevertheless, a larger study group is needed to draw further conclusions pertaining to the oncological efficacy of the technique.

In conclusion, the present manuscript adds further knowledge to the existing “postprostatectomy continence” debate and proposes the use of puboprostatic ligament-sparing nSLEEP as an intriguing method to ascertain recuperation of early continence after surgery, without hindering the final oncological outcome to the procedure.

References


Editorial Comment
Bertrand Guillonneau, New York, USA
guillonb@mskcc.org

Each team that makes all the efforts to improve the results of the surgery it offers to patients should be credited for: auto-evaluation, self criticisms and subsequent modification are the only way that may lead toward improvement.

But this endeavor follows very rigid pathways; otherwise, the evaluation process will become self-congratulatory. There is a fine line between the two, and only a strong methodology is the warrant of a good analysis.

The debate over whether to spare or not the puboprostatic ligaments has been going on for quite some time now, with pro and cons arguments, and the goal of this article is to provide some input on this question, with the conclusion that this technique could facilitate the recovery of continence without compromising the oncological efficacy of the procedure.

Maybe.

But this article raises some questions that must be answered before considering this technique as a surgical improvement.

In the methodology, first, we should remember that this study is based on two consecutive series of patients, and the question is clearly whether the experience gained in the first series is not part of the quality of the results demonstrated in the second series, without any benefit to the changes in the technique. Only randomized study can answer this question, since the authors are now mastering the two techniques, with and without sparing the puboprostatic ligaments. The conclusion of such a study would be sufficiently strong to stimulate confirmation or infirmation studies. In the mean time, the current methodology used herein precludes any comparison and remains at best a preliminary project.

The second point is oncological. There is a trend at present time to preserve all the fascias surrounding the prostate in order to improve the functional results, be it continence or potency. I have at some point contributed to this trend, and certainly laparoscopy allows pushing the frontiers of the dissection in areas where, sometimes open surgery had some difficulties. But it is not outrageous to remember that radical prostatectomy is performed to cure a prostate cancer that, otherwise, could lead to death. At present time, the incidence of anteriorly located prostate cancer is significant, trend that is easily explained by the fact that the initially large cluster of posterior cancers was diagnosed more easily with widespread prostate biopsies. At Memorial Sloan Kettering Cancer Center, 30 to 35% of the specimen contain tumors anterior to the plane of the urethra, including cancers of the transition zone, an area where the definition of capsule is loose. There is no doubt for me that performing, as a routine, the procedure as it is described in this article may increase the risk that the cancer reach the margin anteriorly. This may not be statistically significant, in a relatively small cohort of patients, but we are all aware that this will become, sooner or later, clinically significant. We just have to wait.

We all would like to find The Trick that will make us better surgeons, and make our patient much happier. My feeling is that there is not one single modification that will make all these differences since the technique of radical prostatectomy is, at present time, so much evolved and refined. It is rather likely that improvement will come from increased experience based on debates, analysis of the pre-operative and intra-operative information, understanding of pathology, review of video-recordings, and careful follow-up. But, first of all, careful evaluation is mandatory and should be an ongoing process.

Editorial Comment
Jens J. Rassweiler, Heilbronn, Germany
jens.rassweiler@klinikum-heilbronn.de
jens.rassweiler@slk.kliniken.de

The valid evaluation of the impact of any surgical technique on the functional outcome is a very difficult task, particularly when comparing only modifications of an already standardized technique. During the last two decades, a variety of articles
have been presented aiming to improve early continence after open retropubic radical prostatectomy [1,2]. However, apart from enthusiastic early reports including the preservation of the puboprostatic ligaments, no study was able to provide sufficient evidence for the hypothesis behind this technical step.

Stolzenburg and co-workers now present a non-randomized comparative study on the impact of preservation of the puboprostatic ligaments in laparoscopic radical prostatectomy. Beside the fact, that anatomically every radical prostatectomy has to include a division of the puboprostatic ligaments, and only the degree of incision can be varied [2], this paper has to be critically analyzed:

1. **Patient selection**: The patients have not been randomized, which could result to a selection bias. Furthermore, recruitment sequence (i.e. subsequently) is not entirely clear. The authors try to compensate this by use of specific statistical model (i.e. backward selection).

2. **Different techniques in both arms**: The tested modification of their technique does not only include the preservation of the puboprostatic ligaments, but also a preservation of the endopelvic fascia, described by Menon and his co-workers as the veil of Aphrodite [3]. Therefore, even under the assumption that the study design may enable valid results, the authors cannot distinguish, whether their results are related to the preservation of the puboprostatic ligaments or due to the preservation of the endopelvic fascia or just due to a less traumatic dissection technique at the apex.

3. **Finally**, the number of 50 patients per arm is definitively too low for final conclusions. Even in their own analysis, the lower confidence limit of the p-value regarding the 3 months continence is only 0.46 (Table 3). On the other hand, the subgroups for the analysis of positive margins are too small. It has to be mentioned that Abbou’s group has given up preservation of the puboprostatic ligaments due to an increase of positive margins [4].

The future will show, whether other groups may be able to reproduce the results of this study. In such a trial, a randomized study design with a sufficient number of patients in both arms (i.e. $n = 100–200$), and similar experience with both approaches seems to be mandatory. On the other hand, this study shows, that based on the video-endoscopic technique with magnification of the pelvic anatomy, the dissection technique of the prostate gland can be perfectionized. In my view, this represents the main reason for the improved early continence rather than the preservation of the puboprostatic ligaments respectively only the incision of the anterior part of the ligament [2].

Finally, the authors discuss a very important aspect: regarding the **nomenclature of the periprostatic anatomy** specifically the description of the different fascial layers covering the prostate. Indeed, there is some confusion in the literature (i.e. using the terms “prostatic fascia” or “periprostatic fascia”). Some of this might also be related to the surgical approach (i.e. retrograde versus antegrade) identifying these layers. Nevertheless, I would strongly suggest to adhere to the description of the inventor of the anatomical radical prostatectomy Pat Walsh and his group [5–7]: Three fascial layers surrounding the anterior plane of the prostate can be distinguished: the endopelvic fascia, the lateral pelvic fascia and the prostatic capsule. The NVBs run within the two leaves of the lateral pelvic fascia, namely the levator and prostatic fascia. Posterior-medially, the NVBs are demarcated by Denonvilliers’ fascia, which separates the rectum from the prostatic capsule. According to this, an interfascial preservation of the NVB (i.e. dissection between levator and prostatic fascia) represents the standard technique of open nerve-sparing radical prostatectomy.

**References**