Role of preserving the bladder neck in urinary continence in patients with radical retropubic prostatectomy

B. Feciche, V. Ona*, C. Rusu, L. Gorbatai, T. Botezan, N. Salageanu
Urology Department of the County Emergency Hospital, Satu-Mare
* Urology Department of the Municipal Clinical Hospital, Cluj-Napoca

Abstract

Introduction: Radical prostatectomy is the main therapeutic method applied to cure localized prostate cancer. This paper assesses the value of preserving the bladder neck within the preservation of postoperative continence in several patients operated on by means of radical retropubic prostatectomy technique.

Material and Method: In the period between January 2011 and December 2013 there were 21 radical prostatectomies performed in our department. All patients operated on were monitored from a clinical, imaging, biochemical point of view - PSA. The continence was considered optimal in patients that did not use pads, medium incontinence - a pad/day, severe incontinence - at least two pads/day. This functional parameter was evaluated as of the first check at 4-6 weeks after surgery.

Results: Three patients of those for whom the preservation of the bladder neck was not performed used a single pad / 24 hours after 3 months. (30 %) In the group of operated patients with preservation of the bladder neck, there was only one patient of 11 (9.09 %) who used one pad / 24h, 6 months after surgery.

Conclusions: Bladder neck preservation through meticulous and delicate technique have a value in continence recovery after surgery and is supported by the results obtained.

Keywords: continence, prostatectomy, bladder neck

Correspondence: Bogdan Feciche, MD, PhD, FEBU,
Satu Mare, 1 Ravensburg Street,
County Emergency Hospital, Urology Department
E-mail: drfeciche@yahoo.com
Introduction

Radical prostatectomy is the main therapeutic method applied to cure localized prostate cancer. In the recent decades, trans-and extraperitoneal laparoscopic approach, respectively, the robotic-assisted laparoscopic approach have developed from the classical surgical technique.

The widespread use of classic laparoscopy and especially the use of robotic-assisted laparoscopy influenced the accuracy of the classical technique, as these identify several aspects having potential for functional recovery – preservation of the neurovascular bundles, selective ligation of the dorsal penile vein complex, maximal preservation of the functional urethra, preservation of the bladder neck, perianastomotic reconstruction of the posterior rhabdosphincter.

This paper assesses the value of preserving the bladder neck within the preservation of postoperative continence in several patients operated on by means of radical retropubic prostatectomy technique.

Material and Method

In the period between January 2011 and December 2013, we performed a total of 311 ultrasound-guided prostate biopsies at the Department of Urology of the Emergency Hospital of Satu Mare County. 94 cases of prostate adenocarcinoma were detected. After staging the patients (clinically, transrectal and abdominal ultrasound, computed tomography and / or magnetic resonance imaging), there were 26 cases of localized stage - 16 in stage T1cN0M0, six in stage T2aN0M0, four in stage T2bN0M0. In this series, there were eight locally advanced non-metastatic cases.

The patients were presented therapy possibilities and possible complications. There were 36 cases with indication of radical prostatectomy according to EAU guidelines. 21 of them of them were treated in our service. Two cases could not be monitored. Thirteen cases were referred to other services - three cases were sent for radical robotic-assisted prostatectomy, two cases were operated on by standard laparoscopic technique, one case was treated by cryotherapy, four cases were treated by brachytherapy, three patients chose external radiotherapy.

Surgical method. General anesthesia IOT, with catheter for continuous epidural analgesia fixed before surgery in 6 patients, respectively unique spinal anesthesia in 5 patients. Lying down position on the surgical table with Trendelemburg position at 20 -30 degrees. Preparation and disinfection of the abdomen and perineum. Sterile urethra – bladder examination, and fixing a probe Ch 14 (for easier placement of the anastomosis threads after partial sectioning of the urethra). The subumbilical incision exceeds the symphysis caudally by 3-4 cm so after opening the abdominal wall, the pubic arch was clearly visible in the surgical wound. Wide separation of the peritoneum laterally to the external iliac vein is clearly visible. Setting of a Balfour retractor at a third of the caudal pole of the wound. The pre-and lateral prostatic fat is coagulated and removed. For optimal viewing of this level, we may use either a frontal lamp, or optical cable used in endourology. After the standard incision of the endopelvic fascia, we continue its opening forward, in circle; thus the apical structures are pushed caudally, and they are not incised. Layer ligation of the vein complex with absorbable thread 4.0 on needle 5/8. Thus the sphincter elements are protected. The dissection of the urethra after its palpation was performed with an atraumatic blunt dissector that was inserted into the space among the urethra, apex and bundles. Only after the creation of this space, the urethra was incised. Setting the threads at anterior urethral level, threads 4.0 or 5.0. The dissection continues retrograde on the median line by pushing the Denonvilliers fascia and on the side from the space created between the apex and bundles using a very sharp right angle Barre retractor. The hemostasis at this lateral prostate level was performed by applying threads 5.0 or 6.0 of absorbable material, in X, but not immediately, because most of these light bleedings stopped within a few minutes, when the dissection was continued. An important step was the prostate – bladder junction dissection with a sharp dissector or with scissors without opening the bladder neck. The entire preservation of the bladder neck was possible in eleven cases. After the excision of the prostate - seminal piece, we made the possible outstanding hemostasis and anastomosis was performed after setting a 18 Ch Foley 2-way catheter (to avoid the chocking of a unique way). Before performing the anastomosis, we made the verticalization of the bladder by passing 2.0 Lambert cross threads in the anterior wall of the bladder - intussusception of the bladder neck. We used 5 or 6 urethral – bladder threads of absorbable material, 4.0 or 5.0. The posterior threads filled mandatorily the Denonvilliers fascia thus strengthening the elements of the posterior rhabdosphincter. We performed light traction in the catheter maintained until the closure of the surgical wound.

All patients operated on were monitored from a
Clinical studies

clinical, imaging, biochemical point of view - PSA. The continence was considered optimal in patients that did not use pads, medium incontinence - a pad / day, severe incontinence - at least two pads / day. This functional parameter was evaluated as of the first check at 4-6 weeks after surgery. The present study did not assess pre-and postoperative sexual function, but patients were properly informed about the possible iatrogenic intervention on erectile capacity.

Results

Average surgery time – 180 minutes (extreme 300 minutes the first prostatectomy, average of the last five procedures – 120 minutes)

Mean intraoperative hemorrhage – 500 ml (200 ml – 1200 ml). This parameter was recorded by the anesthetist by analyzing the amount of the liquid aspirated during surgery, respectively the medical dressing used

The percentage of patients transfused - 16 of the 21 patients (76.19 %)

The mean duration of catheterization - 10 days (7-21 days)

Mean duration of hospitalization - 7 days

Postoperative drainage was suppressed after 72 hours in 18 patients. In the case of three patients (14.28 %) urinary fistula persisted five, nine and ten days and they needed prolonged urethral – bladder drainage.

One patient experienced postoperative deep venous thrombosis remitted by specific methods.

One patient developed lymphocele for which percutaneous puncture was performed. The patient in question, 59 years old, with the preoperative diagnosis of prostatic adenocarcinoma T3aNxM0 Gleason 9 (4+5) PSA 12 ng/ml with velocity of 5 ng/ml/year chose to begin multidisciplinary therapy with surgery - prostatectomy + extended lymphodissection (pN0 16 ggl). Subsequently, we initiated complete androgen blockade and external radiotherapy. 12 months after surgery, the clinical and oncological status were optimal. The continence was regained after 9 months.

Two patients had stenosis of urethral – bladder anastomosis, for which we performed optical internal urethrotomy.

Continence 6 months after surgery

Within the series analyzed according to the above criteria, there is a patient with severe incontinence (big median lobe after surgery, without having the technical possibility of bladder neck preservation). Three patients of those for whom the preservation of the bladder neck was not performed used a single pad / 24 hours after 3 months. (30 %) In the group of operated patients with preservation of the bladder neck, there was only one patient of 11 (9.09 %) who used one pad / 24h, 6 months after surgery.

In the series analyzed, there were two patients with positive resection margins; these were patients preoperatively staged as local – advanced stage patients.

No positive margins were found at the basis of the prostate in patients operated by bladder neck preservation technique.

Undetectable PSA after surgery at 3 months – 17 of 21 operated patients (80.9 %).

The postoperative radiotherapy was applied in three patients.

Neoadjuvant hormone therapy – a case of prostatic adenocarcinoma stage T3bN0M0 PSA 19 ng/ml, who had a six-month cycle of complete androgen blockade and then, total prostatectomy was performed.

Postoperative hormonetherapy was applied in five cases; the indication was determined by the oncologist.

Discussions

Radical prostatectomy technique is a dynamic theme because in the last three decades the understanding of the anatomy of functional periprostatic elements evolved continuously. Starting with the description of the dorsal vein penile complex and the surgical technique for the control of bleeding at this level (Walsh, Donker – 1982) described successively surgical techniques that attempt to preserve various anatomical elements that have a role in continence. The widespread use of classic laparoscopy and particularly the robotic-assisted laparoscopy influence the accuracy of the classic technique, as these identify several aspects having potential for functional recovery [1,2,3,4,5].

The most important of these refinements of surgical technique are: preservation of neurovascular bundles (Walsh, Stein – 1991 [5]), selective ligation of the dorsal penile vein complex and maximal preservation of the functional urethra (Huland – 2011 [6]), preservation of bladder neck in classic surgery (Solloway – 1998 [7]) respectively in robotic-assisted laparoscopic surgery (Ficarra – 2013 [8]), perianastomotic reconstruction of the posterior rhabdosphincter in classic surgery (Rocco F – 2006 [9]), respectively in robotic surgery (Rocco B – 2009 [10]), use of tension – free urethral – bladder
anastomosis by anchoring the bladder to the pubic symphysis (Rogia – 2013 [11]), anterior dissection of periprostatic fascia at a “high” level, at a distance of the neurovascular bundles (Myers – 2012 [12]). The sequence of technical improvements presented above evolved almost in parallel among classic, laparoscopic or robotic-assisted surgical techniques. But each has improved leading to the need for a thorough dissection regardless of the approach used.

In this context, the preservation of the bladder neck is one of the topics discussed in all three types of surgical approach. The preservation of the smooth sphincter was considered important in regaining early continence in patients operated on classically by Soloway in 1998. [8]. In his study, he assessed continence in 195 patients out of a total of 365 patients operated on, and continence after 3 months was present in 88% of them, without compromising the surgical margins.

In 2013, Brunocilla made a prospective study on a limited number of patients but very carefully quantified and he established a net improvement of early postoperative continence, 3 and 7 days after catheter removal compared to patients for whom the bladder neck was not preserved. [13]

Standard laparoscopic prostatectomy also allows the maintenance of the integrity of the bladder neck. In a study published in 2013, Luo introduced 145 patients and assessed the impact of smooth sphincter preservation. The results obtained support the advantage of this technique in acquiring early continence (defined by the authors as being up to 3 months after surgery) but with no significant changes 6 months after surgery. The authors did not mention a negative impact of this technique on the margins of excision [14]. Another group of patients monitored prospectively (Chlostoa - 2012), 194, were operated on laparoscopically and the benefit of bladder neck preservation was also supported. The continence at 3 months was achieved in 75% of patients 3 months after surgery [15].

Robot-assisted surgery took the technique of bladder neck preservation in several series reported in the literature. One of the most significant works that corroborated cases of robotic surgery and classic surgery in several reference centers in Italy (Gacci, Carmignani, DeCobelli - 2011), a total of 2408 patients, emphasizes the central role of bladder neck preservation in early postoperative continence.

Conclusions
This paper presents the experience of an initial series of patients operated on by means of radical retropubic prostatectomy technique; the surgical team trying to add in practice the most of surgical tricks known for complete functional recovery.

A central role in this respect is occupied by bladder neck preservation through meticulous and delicate technique, and the value of this element in continence after surgery is supported by the results obtained.

Comment - Prof. Ioan Coman, MD, PhD
The functional and oncological results presented by the authors on a first batch of 21 radical retropubic prostatectomies are comparable to the results of any other service with extensive experience in performing this intervention, not those of a team on the learning curve.

This first learning curve has been completed in robotic interventions practiced in the “Robotics Surgery Center of the Municipal Clinical Hospital of Cluj Napoca”, which facilitated the implementation of all advantages of robotics in classic surgery and getting these exceptional results even in the first cases.

The DaVinci robot facilitates not only the obtaining of quality oncological and functional results, but also transferability of robotic “Tips & Tricks” in classic or standard laparoscopic surgery.

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