Nerve Sparing, Robot-Assisted Radical Cystectomy with Intracorporeal Bladder Substitution in the Male

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Purpose: We provide a step-by-step description of our technique of nerve and seminal vesicle sparing robot-assisted radical cystectomy with AN orthotopic neobladder. We also present preliminary oncologic and functional outcomes.

Materials and Methods: Nerve and seminal vesicle sparing robot-assisted radical cystectomy with a modified Y-shaped orthotopic neobladder was performed by the same surgeon in 40 men with clinically localized bladder cancer from January 2011 to September 2014. Operative, perioperative and pathological data as well as continence and erectile function outcomes are presented.

Results: Median followup was 26.5 months (range 8 to 52). A soft tissue positive surgical margin was found in a patient with pT3a disease. A global rate of 30% early and 32.5% late complications was observed. However, the grade III or higher complication rate was low in both settings at 2.5% and 5%, respectively. There was 1 cancer related death 23 months after surgery. Of the 40 patients 30 (75%) gained daytime continence (0 pad) within 1 month postoperatively. The 12-month nocturnal continence rate was 72.5% (29 of 40 patients). Mean preoperative IIEF-6 (International Index of Erectile Function-6) score was 24.4. Erectile function returned to normal, defined as a IIEF-6 score greater than 17, in 31 of 40 patients (77.5%) within 3 months while 29 of 40 patients (72.5%) returned to the preoperative IIEF-6 score within 12 months.

Conclusions: In the hands of an experienced surgeon nerve and seminal vesicle sparing robot-assisted radical cystectomy with intracorporeal reconstruction of the neobladder seems feasible and safe. It provides short-term oncologic efficacy and promising functional outcomes. Yet comparative, long-term followup studies with standard open cystectomy are required.

Key Words: urinary bladder, urinary diversion, cystectomy, robotics, penile erection

Abbreviations and Acronyms

DF = Denonvilliers' fascia
EBL = estimated blood loss
EF = erectile function
EFR = EF recovery rate
nsRARC = nerve sparing RARC
NVT = neurovascular tissue
ORC = open radical cystectomy
PDE5-I = phosphodiesterase 5-inhibitor
PSM = positive surgical margin
RARC = robot-assisted radical cystectomy
SV = seminal vesicle
VD = vas deferens

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OPEN radical cystectomy with extended pelvic lymph node dissection is the mainstay surgical approach in patients with muscle invasive bladder cancer or noninvasive tumors at high risk for progression.[1] RARC is increasingly used as a minimally invasive alternative to ORC. Cumulative data to date have demonstrated that its safety and early oncologic results were at least not inferior to those of ORC in a select group of patients.[2]

Despite the ongoing evolution of nerve sparing techniques erectile dysfunction remains a health related

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quality of life domain that is commonly impaired after radical cystectomy.[3] Furthermore, the technique of nsRARC is not yet standardized while its effects on sexual function have still scarcely been investigated.[4,5]

We describe our technique of nerve and SV sparing RARC with orthotopic bladder substitution and present the perioperative, oncologic and functional outcomes.

MATERIALS AND METHODS

From January 2011 to September 2014 nsRARC was performed in 40 men with clinically localized bladder cancer. These patients represented a highly selected subgroup of 400 who underwent laparoscopic or robot-assisted radical cystectomy as performed by the same surgeon (RG). The study was performed in accordance with Good Clinical Practice rules and the ethical principles of the 1989 Declaration of Helsinki, 3rd (Hong Kong) amendment. Each patient provided written informed consent.

Main Outcome Measures

Major comorbidities, operative time, EBL, inpatient and outpatient complications, hospital stay, oncologic outcomes (pathological stage and soft tissue and prostate PSMs), continence and EF data were prospectively registered in a customized, ethics approved database and retrospectively evaluated in May 2015.

Preoperative and postoperative daytime and nighttime continence, defined as zero pads per day and night, respectively, was evaluated at the time of catheter removal, and 1, 3 and 12 months after surgery. A voiding chart was completed by every patient for 2 consecutive days 1, 3 and 12 months postoperatively, and annually thereafter.

EF was evaluated with questions 1 to 5 and 15 of the IIEF-6 erectile function domain score questionnaire 3, 6 and 12 months after surgery or until complete return to baseline. Potency was defined as a IIEF-6 score greater than 17 with or without PDE5-Is according to other studies.[4,6] Complications were graded according to the modified Clavien system.[7]

A fellow not involved in direct patient care collected and reported data to the database during inpatient stay. Following discharge home data on regional patients were entered in the database during the planned in-hospital followup visits. Data on patients from other geographic areas were assessed via telephone interview for complications and continence status. IIEF-6 questionnaire results were collected via mail.

Supplementary Appendix 1 (http://jurology.com/) lists the indications for nsRARC. A rectal enema was applied preoperatively. Low molecular weight heparin for up to 4 weeks postoperatively and a single course of a second-generation cephalosporin given intravenously less than 1 hour before skin incision and continued for 24 hours after surgery were used for thrombus and antibacterial prophylaxis, respectively. The preoperative urinalysis was sterile.

Patients with locally advanced or node positive disease with no evidence of any microscopic residual disease were not offered adjuvant chemotherapy.

Surgical Technique

Port placement is identical to what we previously described for prostatectomy[8] with the difference that all trocars are shifted cranially by 2 cm. The patient is placed in a steep Trendelenburg position and the robotic system is docked.

The technique starts with extended pelvic lymph node dissection to expose the bladder pedicles and prepare for subsequent resection of the bladder. The nodes medial to the ureter (ie around the proximal half of the common iliac artery/aortic bifurcation) are spared to avoid injury to the hypogastric nerves.[9] All removed lymph nodes are placed in an Endobag™.

The ventral aspect of the anterior division of the internal iliac artery is progressively dissected free of lymphatic tissue. This is done to identify the bladder pedicles, which are clip transected in close proximity to the bladder. Dissection is then extended along the lateral surfaces of the bladder, keeping the dissection plane medial to the sagittal plane of the medial umbilical ligament, up to the reflection of the endopelvic fascia on the lateral surface of the prostate. The distal ureter is clip transected.

The peritoneum overlying the rectovesical pouch is transversely incised, and the VD and the SVs are exposed.[10] Dissection proceeds along the ventral aspect of the DF fascia and is maintained in the V-shaped area formed between the ampullae of the 2 VDs. The medial and ventral surfaces of the SV base is freed while no dissection is performed at the level of the tip and the middle part of the SV, which is encaged by parasympathetic nerve fibers.[11,12]

Attention is then focused on the lateral prostatevesicular angle. The proximal prostatic pedicle is severed progressively along the capsule of the prostate. Dissection proceeds in a dorsal direction along the base of the prostate and the bladder neck as previously described[13] to reach the DF behind the lateral prostatevesicular angle (fig. 1). [F1]

With the NVT detached from the lateral prostatevesicular angle we transect the SVs at the base, preserving the middle part and tip. This allows for complete preservation of the proximal neuronal network (fig. 2). [F2]

Inverse U peritoneotomy is performed between the 2 internal inguinal rings to gain access to the Retzius space. Nerve sparing proceeds to the apex of the prostate according to the principles of intrafascial, tension and energy-free radical prostatectomy with high anterior release of the periprostatic nerves.[6,8] Small penetrating arteries are secured with titanium clips. The posterior aspect of the prostate is dissected by a completely lateral approach, leaving the DF in place.

At the level of the apex the NVT extends posterolaterally and laterally to the urethra up to the 2 and 10 o'clock positions. It must be carefully mobilized to prevent damaging it, leading to urethral denervation, when severing the urethra or during the neobladder-urethral anastomosis. Accessory pudendal arteries must be spared to preserve EF.

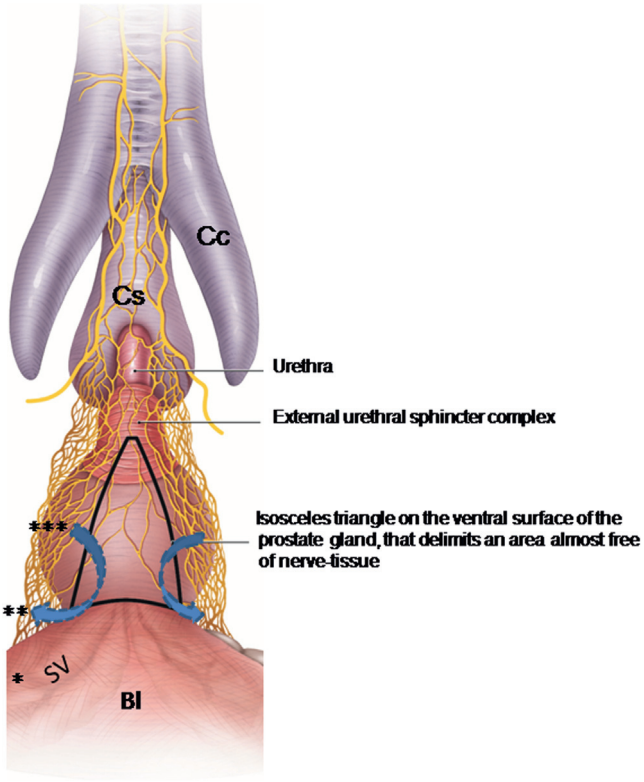

Figure 1. Ventral surface of prostate showing triangular area bare of neuronal tissue. We dissected at level of base angles of isosceles triangle (blue arrows) to detach NVT from lateral prostate-vesicular angle to DF depth. Asterisks indicate 3 main sectors of erectogenic nerves to be preserved (fig. 2). *Cc* corpus cavernosum. *Cs*, corpus spongiosum. *Bl*, bladder.

With the NVT totally detached from the prostate the pubovesical complex (the detrusor apron with associated ligaments and underlying dorsal vascular plexus) is transected, leaving a collar of fibrous tissue in place (ligaments and preserved endopelvic fascia), which acts as a suspensory mechanism for the urethra. The urethra is clip transected with attention to preserving its maximal functional urethral length. Prostatic tissue frequently overlaps the sphincter depending on the shape of the prostate apex. This should be considered for appropriate transection of the urethra.

The specimen is placed in an Endobag. Operative field hemostasis is checked.

A 40 cm ileal segment is isolated 15 to 20 cm proximal to the ileocecal valve and arranged in a modified Y shape [F3] (fig. 3). The distal ureters are implanted without antireflux technique.

All anastomoses are tested for leakage by instilling saline in the definitive neobladder catheter. A pelvic drain is left in place. The specimen is extracted via a 4 to 5 cm infraumbilical midline incision. Supplementary Appendix 2 (http://jurology.com/) shows postoperative care.

RESULTS

In all 40 male patients nsRARC with intracorporeal urinary diversion was completed without open

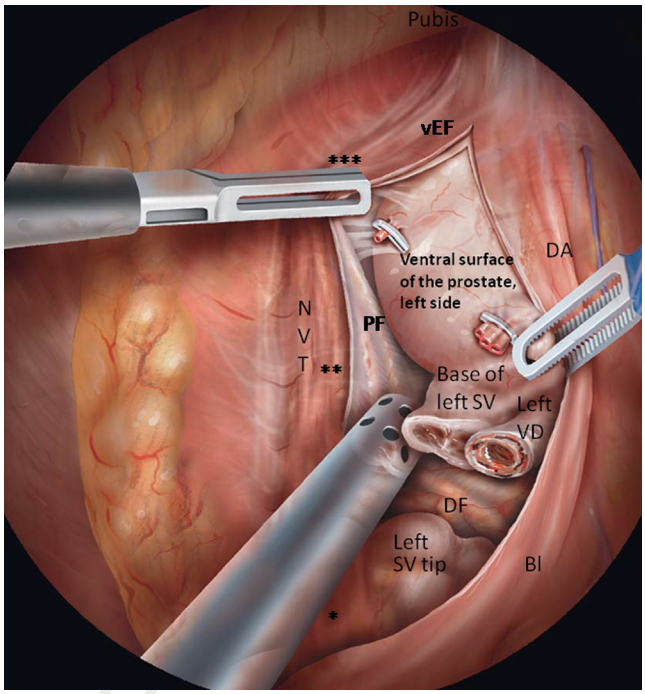

Figure 2. DF is revealed behind medial surface of left SV tip and lateral prostate-vesicular angle. SV tip is then transected. Anatomical and functional intactness of proximal neurovascular plate, which is first sector of erectogenic nerves (single asterisk), is respected. NVT detachment from lateral prostate-vesicular angle as second sector (double asterisks) and subsequent intrafascial dissection of periprostatic nerves to membranous urethra as third sector (triple asterisks) guarantee overall preservation of parasympathetic nerve supply to corpora cavernosa. *vEF*, visceral endopelvic fascia. *PF*, prostatic fascia. *Bl*, bladder. *DA*, detrusor apron.

conversion. All patients provided continence and complication data through telephone interview. The response rate to the mailed questionnaires was 100%.

Mean patient age was 57 years and mean body mass index was 26.4 kg/m^2. Six patients received neoadjuvant chemotherapy. The mean ± SD preoperative IIEF-6 score was 24.4 ± 2.6. Median total operative time was 315 minutes (range 172 to 400). Overall median EBL was 395 ml (range trace to 700), time to a regular diet was 5 days (range 4 to 9) and hospital stay was 12 days (range 11 to 15). Perioperative blood transfusion was administered in 2 patients. Short-term perioperative complications at 0 to 30 days developed in 12 patients (30%) and only 1 complication was high grade (unilateral hydronephrosis due to ureteral catheter obstruction). Long-term complications after 30 days developed in 13 patients (32.5%), which were high grade (pyelonephritis) in 2. Tables 1 [T1] and 2 list patient demographics, perioperative outcomes and complications. [T2]

Pathologically confirmed, organ confined disease was present in 30 patients and locally advanced in 5

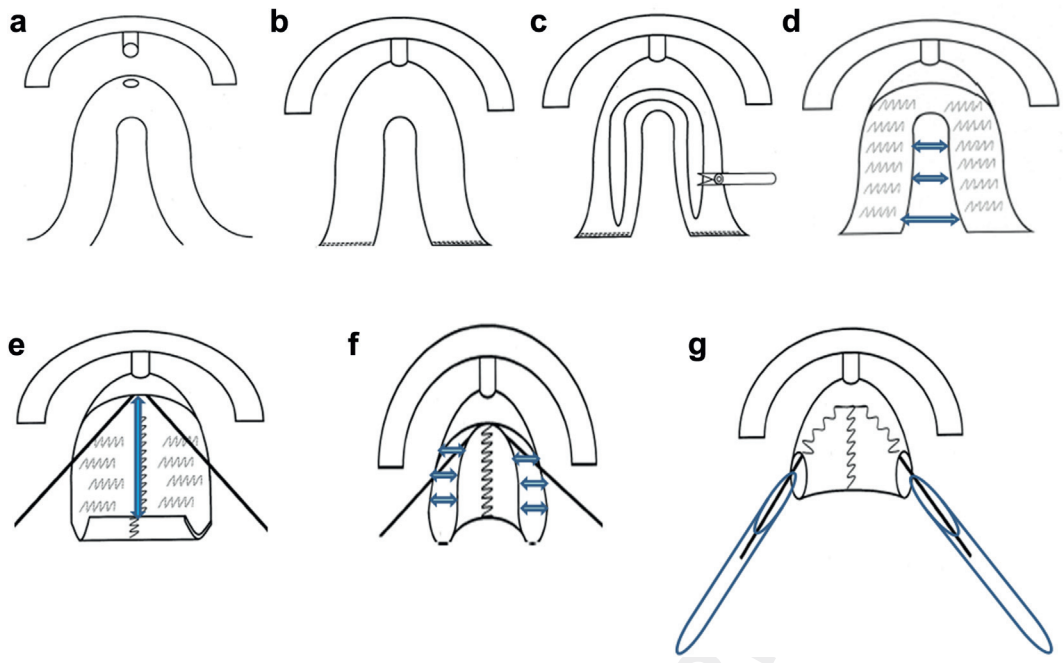

Figure 3. Step-by-step configuration of modified Y-neobladder. Selected ileal segment is brought down to pelvis to ensure adequate mesenteric length to enable tension-free urethroileal anastomosis. Middle antimesenteric part of selected ileal segment is opened with scissors (*a*) and anastomosed to urethra (*b*) on temporary 20Fr Mercier catheter. Detubularization (*c*) and posterior reconstruction (*d*) are performed. Two hydrophilic guidewires are inserted through Mercier catheter (*e*). Anterior reconstruction of neobladder is performed (*f*). Ureters are spatulated for approximately 1.5 cm and directly anastomosed to open ends of neobladder limbs without antireflux technique (*g*). Before completion of ureter-neobladder anastomosis 2 single J stents are transurethrally inserted on guidewires and advanced to renal pelvis.

(table 3). There was 1 soft tissue PSM and no prostate PSM. Five patients had pN+ disease. There was 1 cancer related death 23 months postoperatively in a man with intradiverticular squamous cell carcinoma and negative soft tissue surgical margins. At a median followup of 26.5 months (range 8 to 52) no radiological evidence of disease was observed in the remaining patients.

At 12 months after surgery the rate of daytime continence was 100%. Mean daytime and nighttime voiding frequency was 4 and 3 voids, respectively, and average maximal neobladder capacity was 430 ± 32 ml. There was no case of increased postvoid residual urine and no need for intermittent catheterization. All patients returned to a IIEF-6

Table 1. *Demographics, and operative and postoperative parameters of 40 preoperatively continent men with Gleason grade 3 who underwent modified Y-neobladder urinary diversion with bilateral intrafascial nerve sparing and seminal vesicle sparing*

No. pts	40*
Mean age (range)	57 (48—67)
Mean kg/m^2 body mass index (range)	26.4 (22—34)
No. preop T stage (%):	
T1	14 (35)
T2	25 (62.5)
Tx	1 (2.5)†
No. concomitant CIS (%)	8 (20)
No. bacillus Calmette-Guèrin (%)	10 (25)
No. neoadjuvant chemotherapy (%)	6 (15)
Mean preop IIEF-6 score	24.4
Median mins skin-to-skin operative time (range)	315 (172—400)
Median ml EBL (range)	395 (trace-700)
Median days hospitalization (range)	12 (11—15)
Median mos followup (range)	26.5 (8—52)

* No prostate sparing, conversion, stricture of ureteral-neobladder anastomosis evaluated by computerized tomography excretory phase, stricture of neobladder-urethra anastomosis evaluated clinically by reduction in urine flow or increased post-void residual urine, or metabolic acidosis with computerized tomography performed every 6 months or sooner as clinically suggested.
† Intradiverticular tumor with deep transurethral resection avoided.

Table 2. *Early and late complications in 40 patients*

Complications (days)	No. Pts (%)	Clavien Grade	Outcome
Early (0—30):	12 (30)		
Urinary tract infection	4 (10)	II	Antibiotics
Wound infection	2 (5)	II	Antibiotics
Unknown origin fever	2 (5)	II	Antibiotics
Bleeding requiring transfusion	2 (5)	II	—
Paralytic ileus	1 (2.5)	I	Resolved conservatively
Unilat hydronephrosis due to ureteral catheter malfunction	10 (2.5)	IIIa	Nephrostomy + antegrade stent replacement
Late (after 30):	13 (32.5)		
Urinary tract infection	5 (12.5)	II	Antibiotics
Pyelonephritis	2 (5)	IIIa	Nephrostomy + antibiotics
Lymphocele	4 (10)	II	Antibiotics
Scrotal lymphedema	2 (5)	I	Conservative treatment

Table 3. *Pathological, oncologic and erectile function outcomes*

No. pts	40*	
No. pathological stage (%):		
Less than pT2N0	30	(75)
pT3aN0	5	(12.5)
pN+	5	(12.5)†
Soft tissue pos surgical margins:‡		
No. (%)	1	(2.5)
Stage	pT3a	
Median No. lymph nodes retrieved (range)	19	(9—38)
No. incidental prostate Ca (%)	10	(25)
No. Gleason score:		
Less than 6	7	
7 (3 + 4)	3	
Recurrence	1	(2.5)§
IIEF-6:		
Mean baseline score (range)	24.4 (21—29)	
Adequate EF normal score	Greater than 17	
No. returning to normal EF/total No. (%):‖		
Within 3 mos	31/40	(77.5)
Within 3 mos + tadalafil	22/31	(71)
Within 3 mos, no tadalafil	9/31	(29)
Within 6 mos	40/40	(100)
Within 6 mos + tadalafil	28/40	(70)
Within 6 mos, no tadalafil	12/40	(30)
No. return to preop IIEF-6 score/total No. (%):‖		
3 Mos	15/40	(37.5)
6 Mos	24/40	(60)
12 Mos	29/40	(72.5)
12 Mos + tadalafil	10/29	(34.5)
12 Mos, no tadalafil	19/29	(65.5)
Mean 3-mo IIEF-6 score‖	21.9	
p Value vs preop (t-test)	0.08¶	

* No stage pT4N0 or prostate positive surgical margins in 40 patients and no radiological evidence of disease recurrence in 39 with 1 death.
† Three patients with pT2aN1 and 2 with pT2bN2 characterized by subcapsular micrometastasis without lymph node capsular infiltration signs who received adjuvant chemotherapy.
‡ Treatment was adjuvant chemotherapy.
§ Recurrence in true pelvis in patient with intradiverticular pT2, R0, N0 squamous cell carcinoma.
‖ Data collected by third party and rehabilitation strategy was 1 capsule per day of tadalafil 5 mg for first 2 months postoperatively and as subjectively needed thereafter.
¶ Not significant vs preoperative with significance considered at $p < 0.05$.

score greater than 17 within 6 months postoperatively. Of the 40 patients 29 (72.5%) had returned to the preoperative IIEF-6 score at 12 months, including 19 of 29 (65.5%) without the use of PDE5-Is. Tables 3 and 4 list histopathological, continence and EF outcomes.

DISCUSSION

According to Schlegel and Walsh nerve preservation is performed during ORC to improve postoperative potency rates.[14] Nevertheless, erectile dysfunction affects up to 80% of men following cystectomy and urinary diversion.[15] The importance of nerve preservation for EFR was recently demonstrated by a prospective comparison of 2 groups of patients who underwent nerve sparing ORC and nonnerve sparing ORC in that the nerve sparing group experienced higher EFR.[16] EFR after nerve sparing ORC is age dependent with only a 20% EFR rate in patients older than 60 years.[17] Attempted nerve sparing and age less than 65 years are associated with improved urinary continence.[18]

In the field of robotics nsRARC was first proposed in 2003 by Menon et al.[19] However, they performed extracorporeal urinary diversion and did not provide data on functional outcomes.

In the Karolinska Institute experience 41 of 62 men (66%) underwent nsRARC, of whom 26 of 41 (63%) were potent with or without PDE5-Is after 12 months with potency defined as erection adequate for intercourse.[4] In contrast, Canda et al found IIEF scores greater than 18 in only 1 of 11 preoperatively potent men, although followup was shorter at 6 months.[5] Haberman et al reported a postoperative 45% rate of erection sufficient for penetration with or without PDE5-Is following nerve sparing RARC.[20]

In our series the first potency evaluation was performed with validated questionnaires and according to the criteria of Mulhall.[21] The evaluation was done 3 months after RARC to overcome issues related to postoperative stress/difficulties in the management of the neobladder that could affect patient sexual activity. Excellent EFR results were observed with 77.5% of patients achieving potency (IIEF-6 score greater than 17) within 3 months after surgery and 37.5% attaining the preoperative IIEF-6 score. By 12 months after RARC almost 3 of 4 patients had returned to the preoperative IIEF-6 score.

Regarding continence, Tyritzis et al reported rates of 74% and 88% for 6 and 12-month daytime continence, and 53% and 73% for 6 and 12-month nighttime continence, respectively.[4] In that series continence was defined as the use of a maximum of 1 pad per day. In our study with a strict definition of continence of 0 pad per day daytime continence reached 75% within 1 month and 100% 12 months after RARC whereas the nighttime continence rate was 72.5% at 12 months.

Improved understanding of pelvic neuroanatomy from the aortic bifurcation to the membranous urethra is of paramount importance to enhance nerve preservation. The autonomic nerve supply to the corpora cavernosa consists of fibers originating from the pelvic plexus.[11,22] These nerve fibers run directly beneath the distal ureters, medial to the umbilical artery, alongside the lateral aspects of the SVs and adjacent to the prostatic capsule, and they accompany the membranous urethra or pierce the urogenital diaphragm laterally before entering the corpora cavernosa.[22] The predominant neurovascular bundles and the accessory distal nerve pathways provide innervation to components that are fundamental for the mechanism of continence

Table 4. *Continence outcome in 40 patients*

	Catheter Removal	Postop Mos* 1	2	3
Mean ± SD max neobladder capacity (ml)	—	180 ± 24	220 ± 42	430 ± 32
Mean No. voids:	—			
Daytime		8	6	4
Nighttime		4	3	3
No. continence (%):†				
Daytime	28 (70)	30 (75)	34 (85)	40 (100)
Nighttime	16 (40)	19 (47.5)	24 (60)	29 (72.5)
No. urinary tract infection	—	4	3	2
Mean ± SD serum creatinine (mg/dl)	—	1.18 ± 0.3	1.11 ± 0.27	1.13 ± 0.34

* No need for intermittent catheterization and no pathological post-void residual urine greater than 50 ml.
† Defined as 0 pads per day and night.

(ie urethral sphincter and levator ani muscle) as well.[12]

Thus, the use of energy should be avoided anywhere in the area of the autonomic nerve supply to the corpora cavernosa (fig. 4). Traction on the prostate may be exercised only after total bilateral release of the NVT. The relative absence of neuronal tissue at the ventral surface of the base of the prostate allows for freeing the lateral prostatevesicular angle without nerve damage.[13] Our approach, which spares the tip and the middle part of the SV, maximizes preservation of the lateral cholinergic fibers that cage the SVs[23] while it reduces traction on the proximal neurovascular plate,[24] avoiding neuropraxia. Lateral to the prostate we recommend intrafascial dissection with high anterior release of the periprostatic fascia.

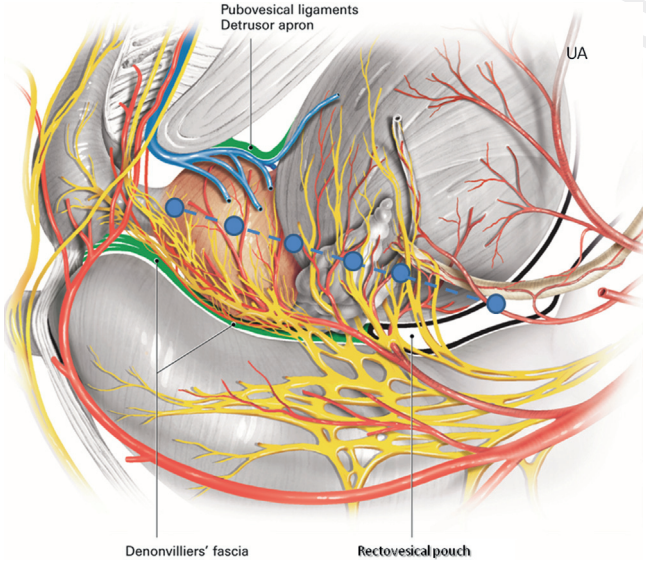

Figure 4. In nerve sparing cystectomy all nerve structures dorsal to virtual straight line from level of ureterovesical junction to ventral prostatic apex should be spared if oncologically safe. Line of blue circles indicates critical areas for nerve damage.

The recent literature shows an overall 30-day complication rate of 45.7% and a 28% high grade complication rate.[25] Our short-term perioperative complication rate was 30% with a 2.5% high grade complication rate. The protocol of postoperative care results conform to current recommendations.[26]

The modified Y-neobladder requires a short tract of ileum and results in an almost spherical urinary reservoir. There is no need to transpose either ureter, which remain aligned in the natural position to avoid traction/kinking and with preserved vascularization. This enables a tension-free ureterneobladder anastomosis with a decreased incidence of strictures.

No urodynamic evaluation of the neobladders was performed. However, data obtained via the voiding charts indicated low 12-month voiding-frequency with no pathological post-void residual urine, good mean maximal functional bladder capacity and no need for clean intermittent catheterization, in contrast to other results.[27] The high incidence of patients able to void without significant post-void residual urine was most likely due to the surgical technique of buttonhole anastomosis. Contrary to procedures that wrap the opened antimesenteric border along the urethra, this anastomosis avoids a funnel-shaped outlet of the reservoir, which may kink and cause functional obstruction.

Younger patients or those who are highly motivated to preserve sexual function are ideal candidates for nsRARC, although nerve sparing also seems beneficial in terms of urinary continence.[18] Advanced age should not be a contraindication to nsRARC. Instead, a differentiation between physiological and chronological age should be made to offer the procedure even to older but healthy and motivated patients. Historically, nerve sparing radical cystectomy has been questioned regarding a potential increase in PSMs and local disease recurrence.[28] In our series local recurrence developed in only 1 patient with intradiverticular squamous cell

carcinoma. The high negative soft tissue surgical margin rate of 97.5% suggests that the procedure leads to satisfactory local control, which is supported by recent literature.[29] However, only patients at lower risk with a limited tumor burden and a lower probability of advanced disease were included in the current series.

The outcomes of this study are the result of the solid previous uro-oncologic/laparoscopic experience of the main surgeon, the maximized preservation of the periprostatic nerves and the accurate selection of ideal candidates. Our outcomes should be interpreted with caution, considering the potential biases of the small sample size, the retrospective data evaluation, the short-term followup and the absence of a comparative group. Furthermore, continence rates and complications after hospital discharge were assessed through remote followup. Consequently, the eventual bias of underreporting or overreporting such events must be considered.

CONCLUSIONS

In the hands of an experienced surgeon nsRARC with intracorporeal construction of the neobladder seems feasible and safe. It provides short-term oncologic efficacy and promising functional outcomes. Yet comparative long-term followup studies with standard open cystectomy are required.

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EDITORIAL COMMENTS

Can nerve sparing radical cystectomy and an intracorporeal neobladder be efficiently performed robotically? This highly experienced team from Bordeaux addressed this question in 40 appropriately selected, young, thin, potent men with unilateral, clinically organ confined (less than cT2 in 97.5% of patients), nonbulky bladder cancer.

Admittedly, this Bordeaux Y-neobladder does not replicate the classic neobladder and does not fully satisfying the LaPlace requirements for a high capacity, low pressure reservoir. Yet the functional results are excellent, including 75% and 100% 1-month and 1-year daytime continence, and 47.5% and 72.5% nocturnal continence, respectively; zero intermittent catheterization; and 100% 6-month return to baseline IIEF-6 scores with/without tadalafil. Perioperative efficiency and oncologic outcomes were also adequate by any yardstick.

Indeed, the authors report on a highly selected cohort (40 of 400 patients). Indeed, this is an expert surgical team. But that is how it should be! Nerve sparing RC is not for every patient, nor is complex neobladder surgery for every surgical team, open or robotic. This high stakes operation requires careful patient selection and considerable surgical expertise. So should this surgery be restricted to expert teams only? Initially yes but as the technique advances others will undoubtedly embark on this road. Some already have. The authors report a meticulous followup using validated third party questionnaires. This report advances the field.

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The authors found that they are perfectly able to remove an anatomically intact bladder in younger men while maintaining functions. Is it infamous or appropriate to state this? 1) They report on a highly selected subgroup of 40 patients of a larger group of 400. 2) Inclusion criteria were pT2 disease or less, a limited tumor load and a favorable location.

Why are the reported functional data so good despite using an imperfect reservoir? 1) The cohort is 10 years younger than a standard cohort. Young men are likely to have good continence even if less attention is paid to nerve sparing. 2) So a 100% daytime continence rate is not a surprise. Diurnal continence is determined only by the condition of the external sphincter irrespective of the type of reservoir and whether it was constructed from tubularized or detubularized gut.[1] 3) Like all robotic surgeons, they use a 40 cm ileal segment.[2] The result is a radius of 4.0 cm, a geometric capacity of 450 cc and a pressure twice as high as that of a standard ileal neobladder (4.8 cm and 1,085 cc).[2]

The authors describe their mastery of RARC with an intracorporeal neobladder with excellent outcomes and they are to be applauded for this. However, does this report provide enough evidence to promote the adoption of RARC with an intracorporeal neobladder? Clearly not. This procedure is at the far end of complex robotic surgery and it should be performed by experts only. The intracorporeal neobladder remains a daunting procedure that is not ready for prime time and should remain in the hands of elite robotic surgeons.

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This group reports excellent functional results in 40 male patients after robot-assisted nerve sparing radical cystectomy and orthotopic ileal bladder substitution. While the results may have been favorably influenced by the small number of highly selected patients of a cohort of more than 200 and other reasons mentioned by the authors, they nonetheless again show convincingly that preservation of the autonomic nerves and, thus, of sphincteric and erectile function, is possible as shown earlier for open cystectomy (reference 18 in article).[1]

The role of nerve sparing in preserving sphincteric function, as in radical prostatectomy, was formerly discussed controversially. In the meantime a prospective multicenter study of 3,379 Swedish men demonstrated a highly significant correlation between the degree of neurovascular bundle preservation and urinary continence after radical prostatectomy.[2] There is no reason why the result should not be similar after radical cystectomy and neobladder construction or, even more important because of the absence of the detrusor-sphincter (guarding) reflex, after cystectomy and neobladder construction. Undoubtedly, nerve sparing during radical cystectomy and pelvic lymphadenectomy is particularly challenging for the surgeon because the autonomic nerves may also be damaged cephalad to the prostate or the vagina.

As shown again by this group of expert surgeons, nerve sparing cystectomy allows for excellent functional results with neobladders. If this is not the case, the neobladder should not be blamed but the surgical technique used during cystectomy should be reconsidered.

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