Different techniques of nerve-sparing during radical cystectomy for bladder cancer

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Introduction

- Bladder cancer is the 10th most common cancer worldwide, with an estimated 54 900 newly diagnosed cases and 200 000 death in 2020.

- The orthotopic bladder substitution (OBS) becomes a common form of Urinary Diversion in patients undergoing RC to preserve an intact body image.

- However, post-operative urinary incontinence, especially the nocturnal incontinence, and sexual dysfunction significantly affect the quality of life (QoL) in men : on average, 10%-15% and 20%-40% of men are daytime and nocturnal incontinence after 12 months of surgery.

Introduction

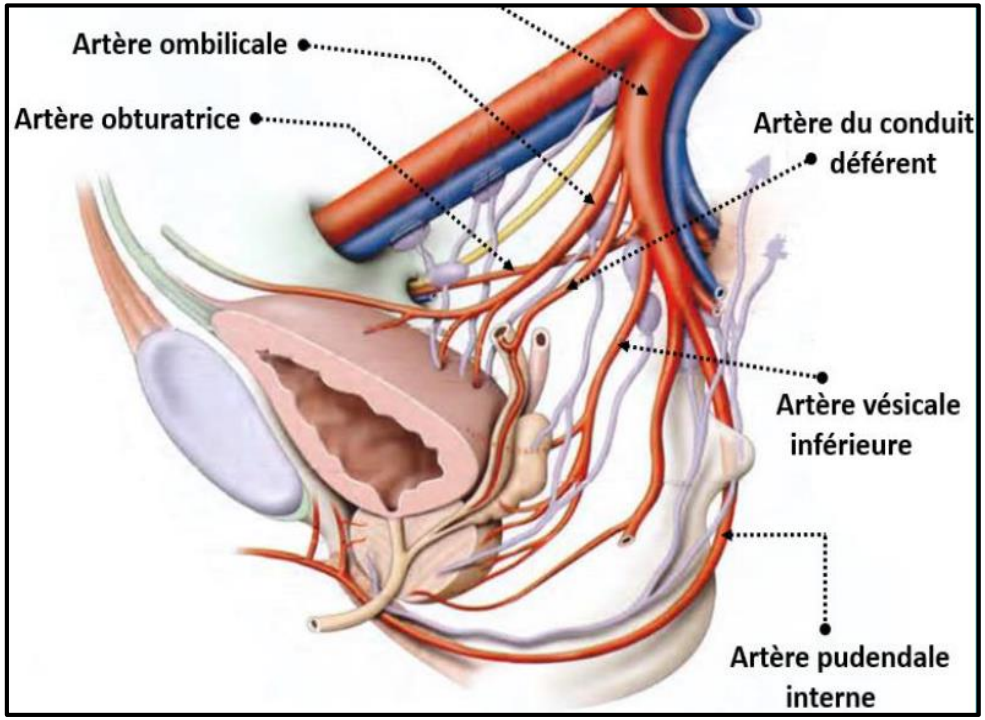
- As for potency, the rate of erectile dysfunction (ED) after RC is 20%-100% in most published articles. These complications could lead to concern and fear for patients and may have an impact on the choice of treatment.

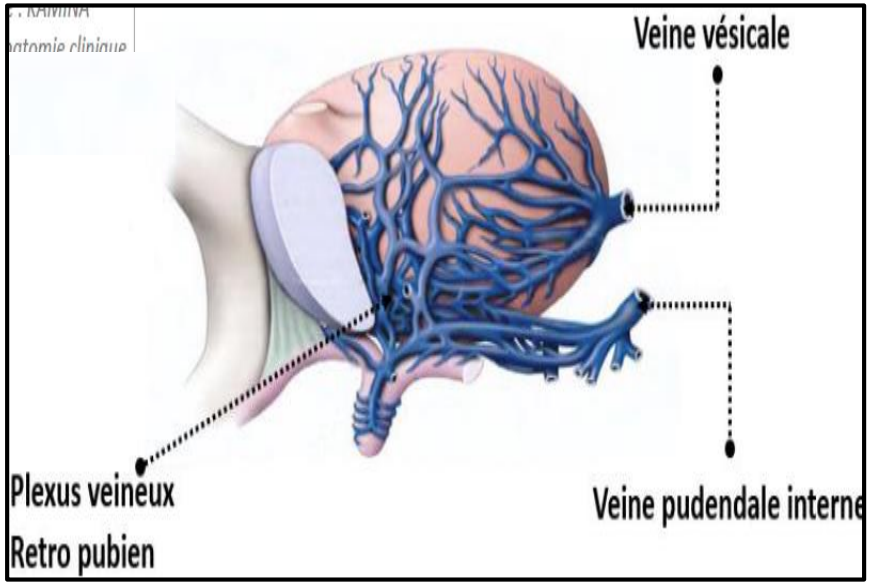
- The goals of urinary tract reconstruction after cystectomy have evolved from simple urinary diversion and protection of the upper tracts to functional and anatomical restoration as close as possible to the natural preoperative state.

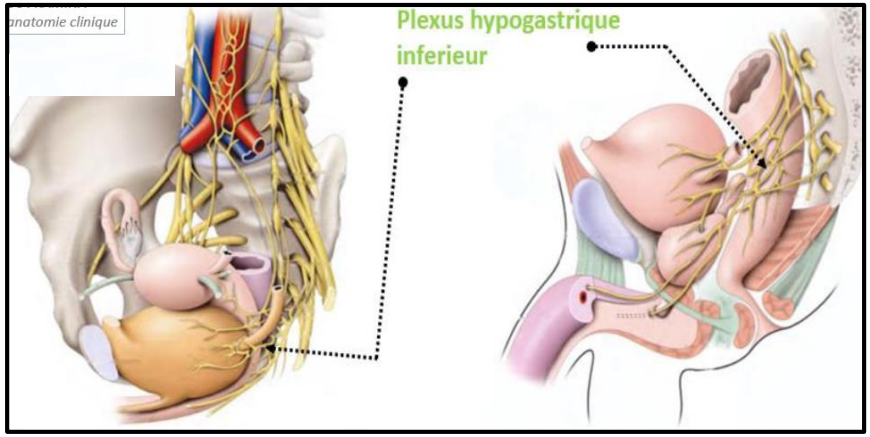
Techniques

1. Nerve sparing cysto-vesicleprostatectomy.
2. Intrafascial seminal sparing cystoprostatctomy.
3. Seminal vesicles and prostate sparing cystectomy.
4. Transprostatic cystectomy with Prostate capsule sparing.
5. Maximum seminal vesicles and prostate sparing cystectomy.

Anatomical bases

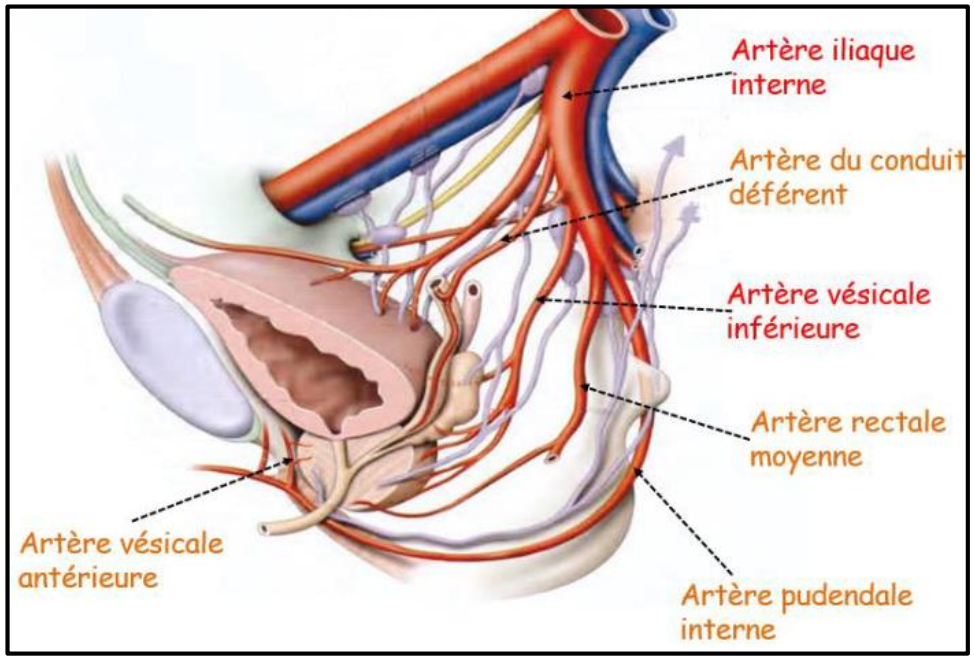


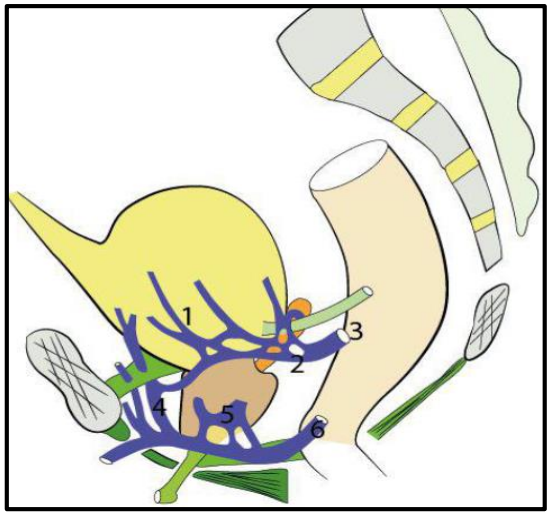


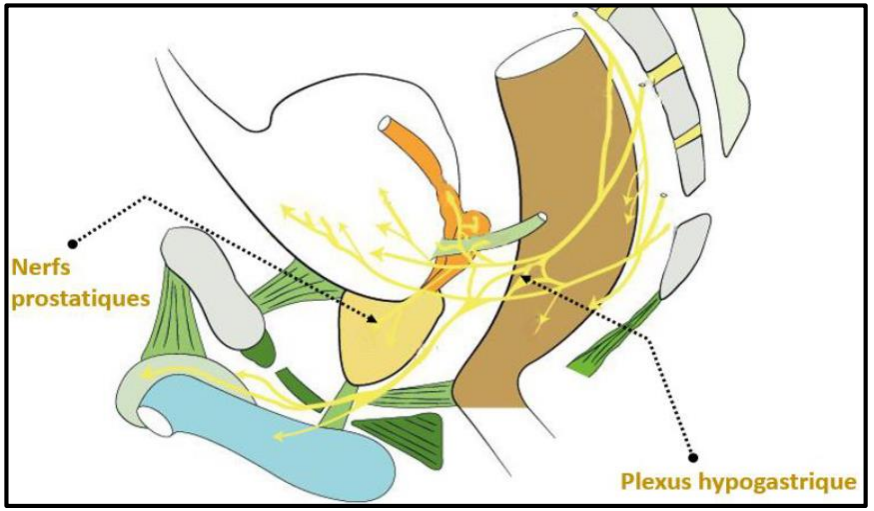


Bladder

Anatomical bases

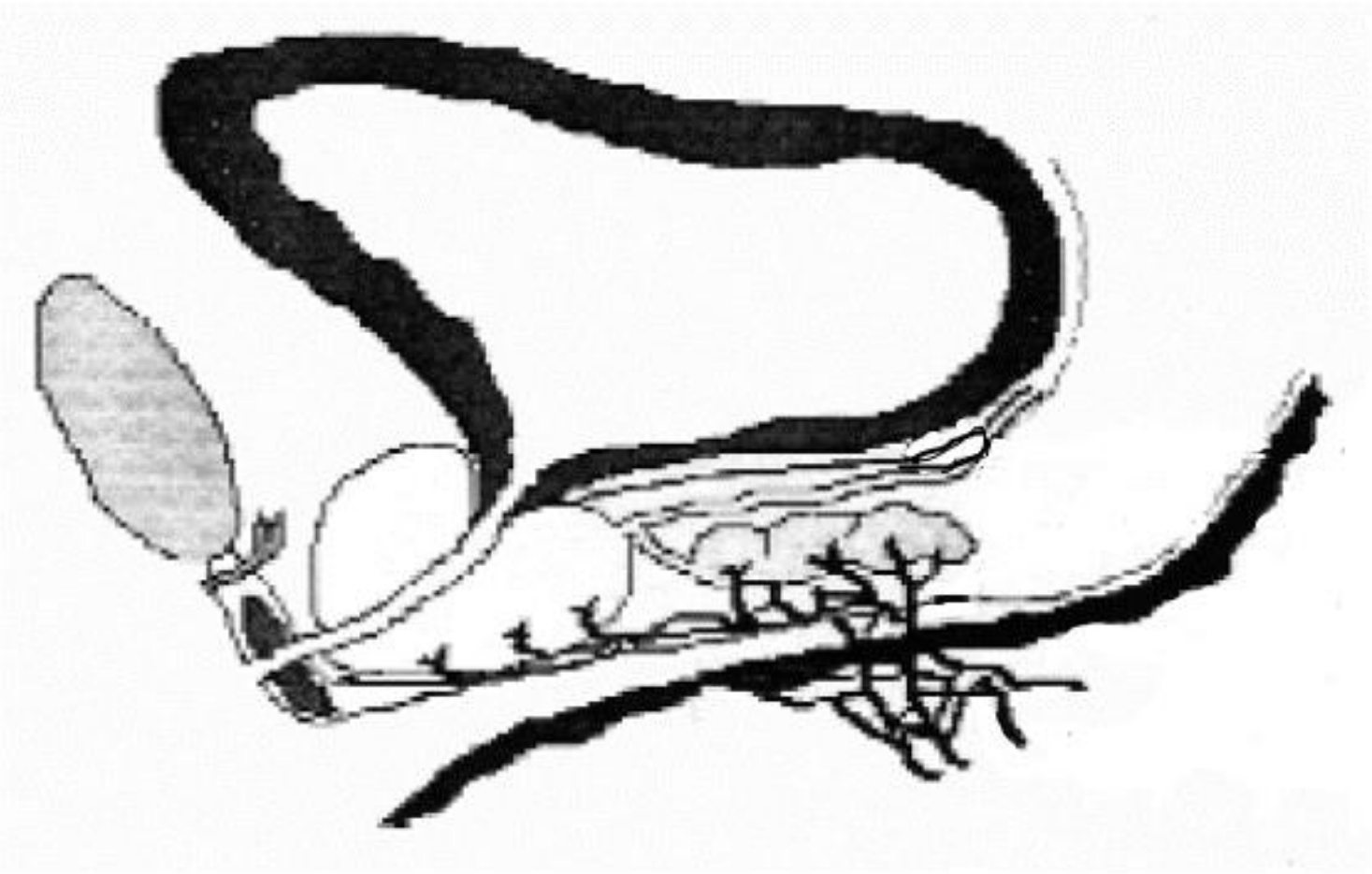




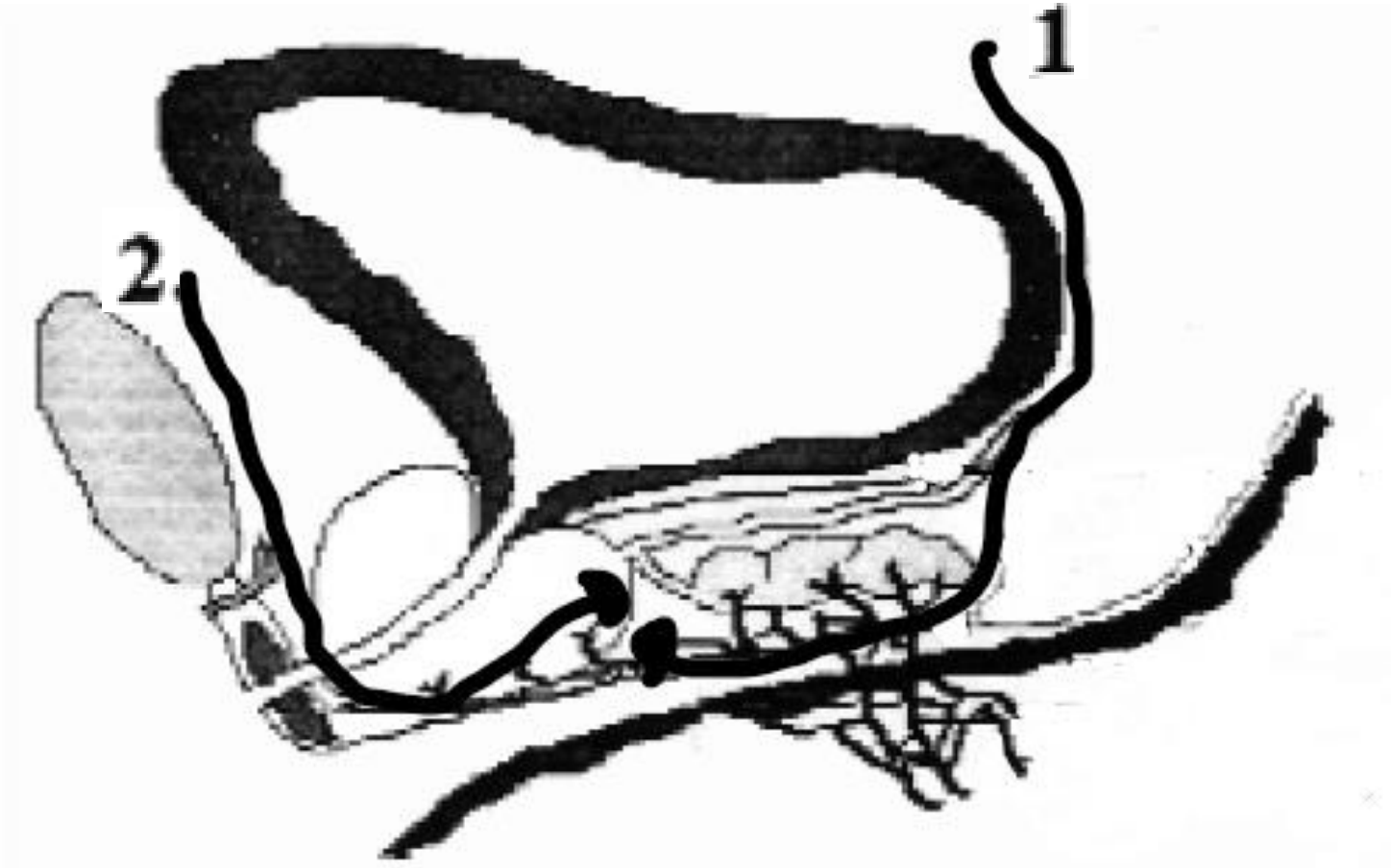


Prostate

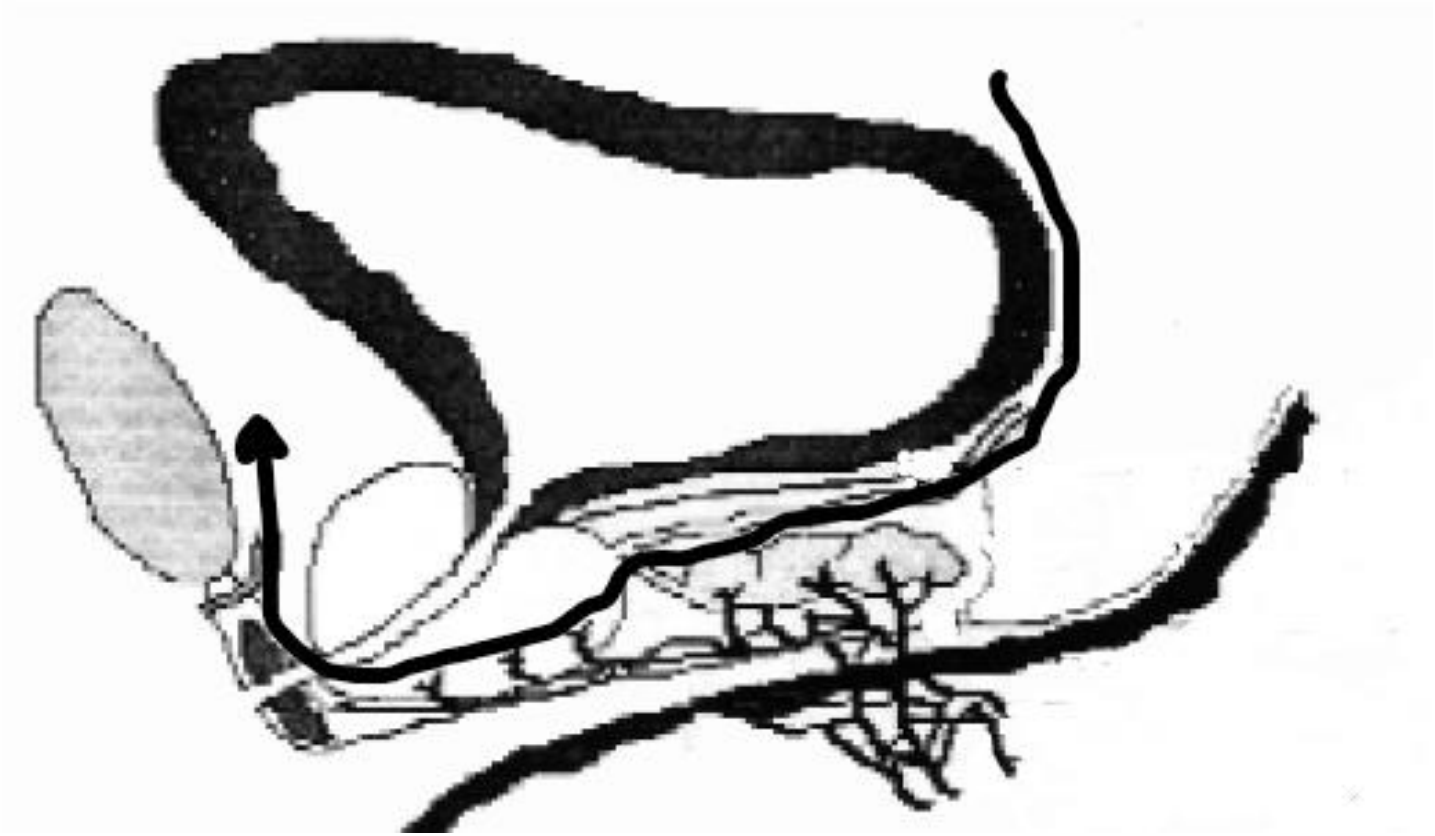
Anatomical bases



Nerve sparing cysto-vesicleprostatectomy



Intrafascial seminal sparing cystoprostatectomy



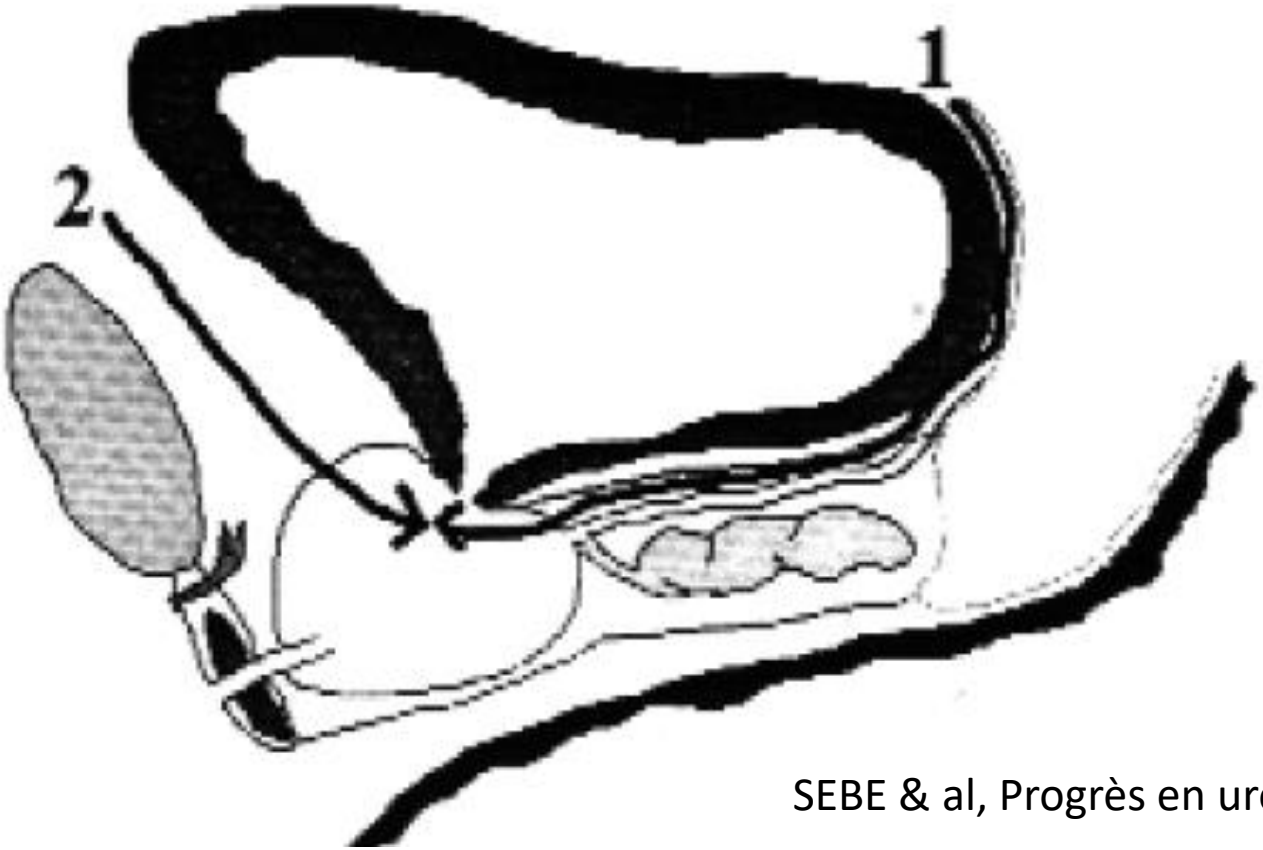
SEBE & al, Progrès en urologie, 2003

Seminal vesicles and prostate sparing cystectomy

During the same surgery or deferred :

TURP & Bladder neck biopsy
(frozen section examination)

Potency ++
Erection & ejaculation



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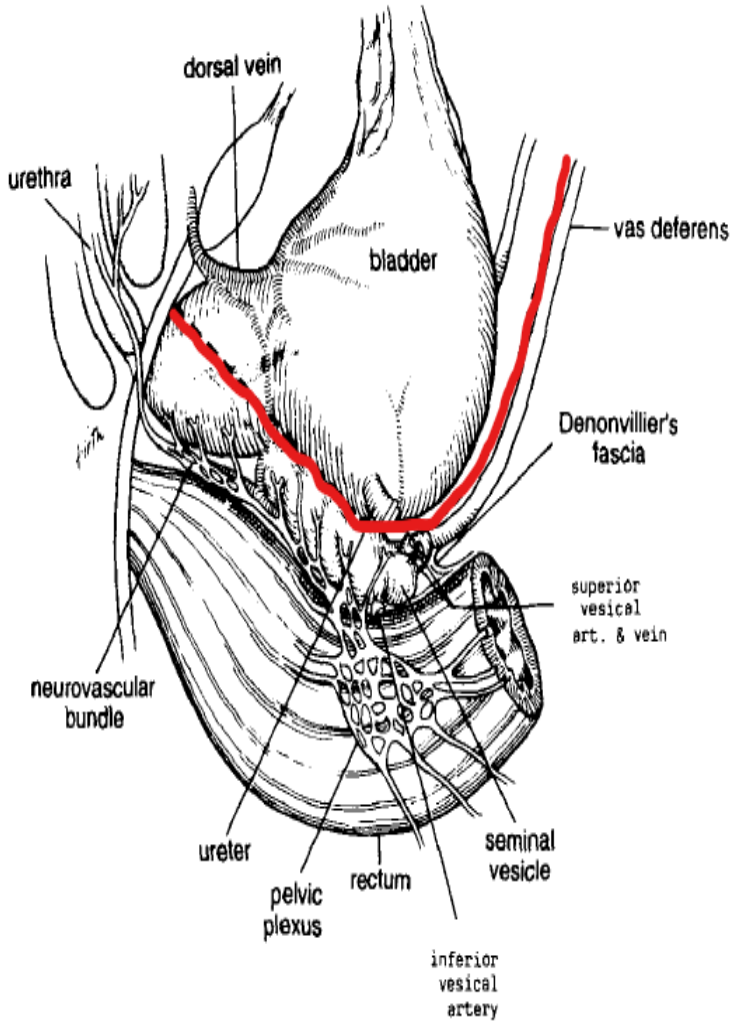
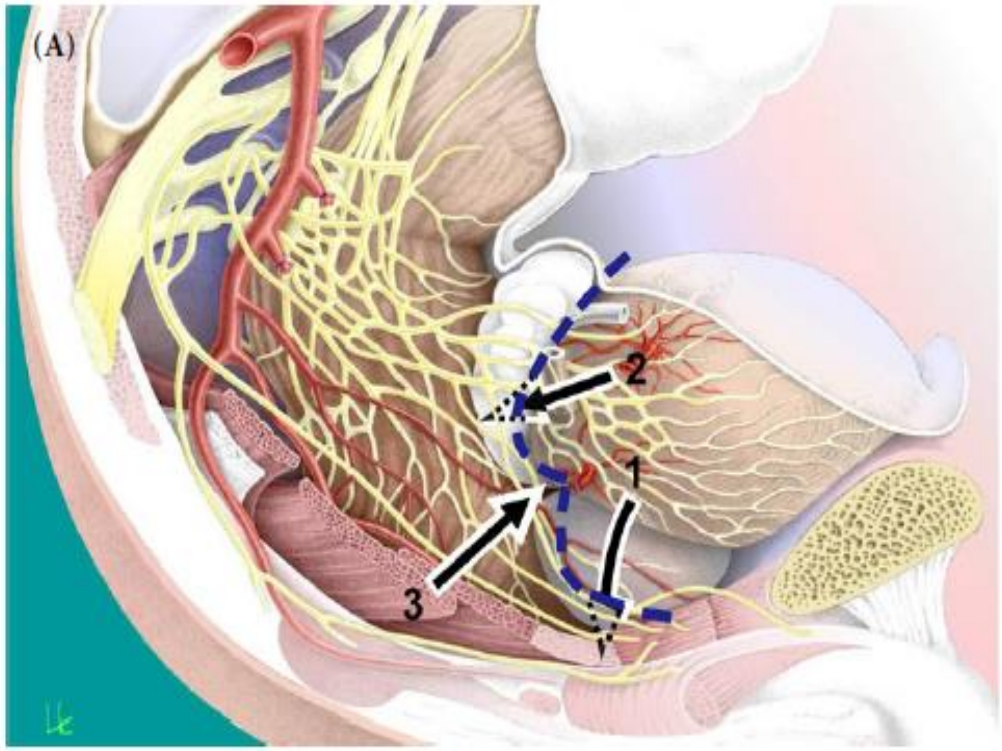
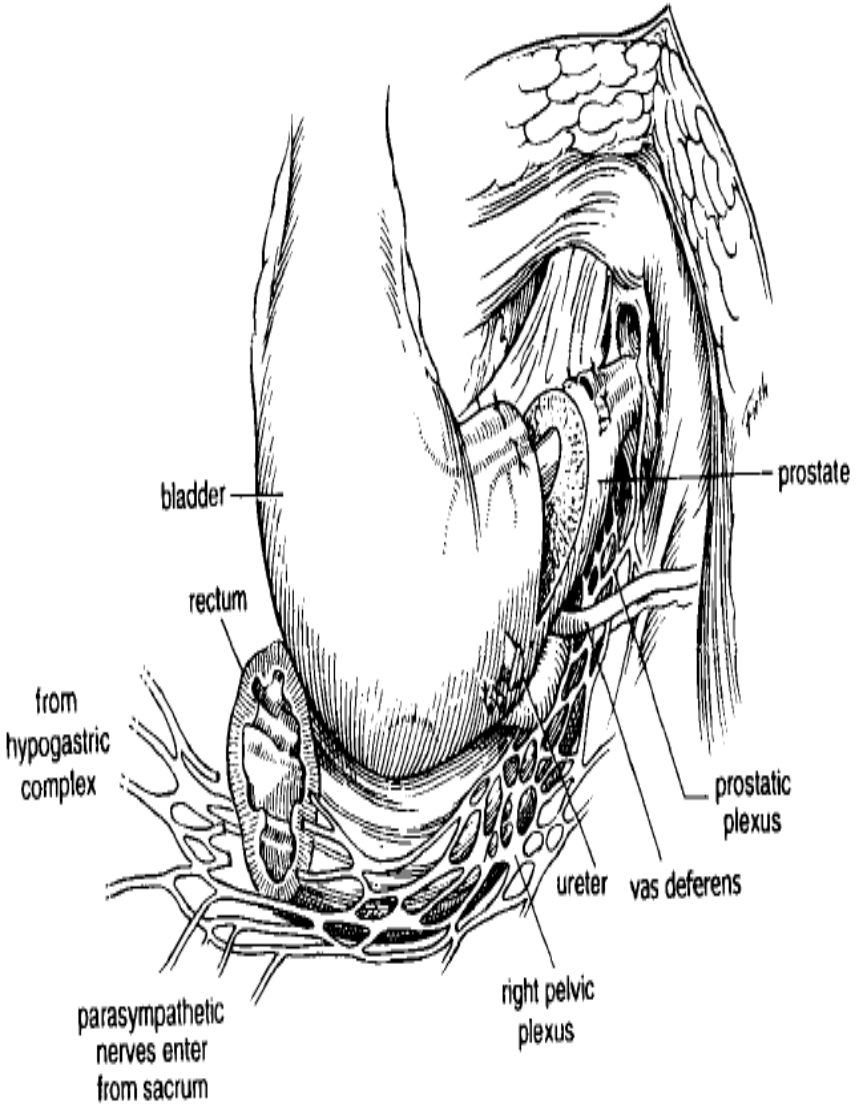
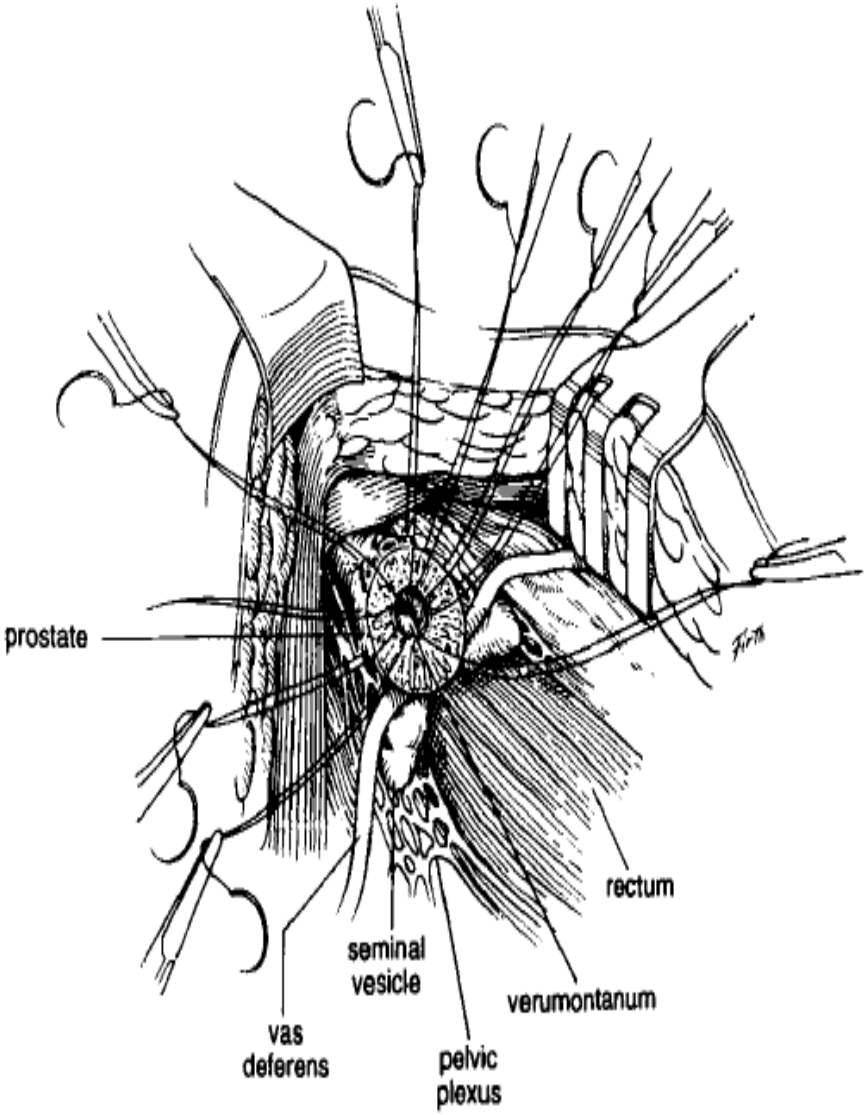

dorsal vein
urethra
vas deferens
bladder
Denonvillier's fascia
superior vesical art. & vein
neurovascular bundle
ureter
pelvic plexus
rectum
seminal vesicle
inferior vesical artery

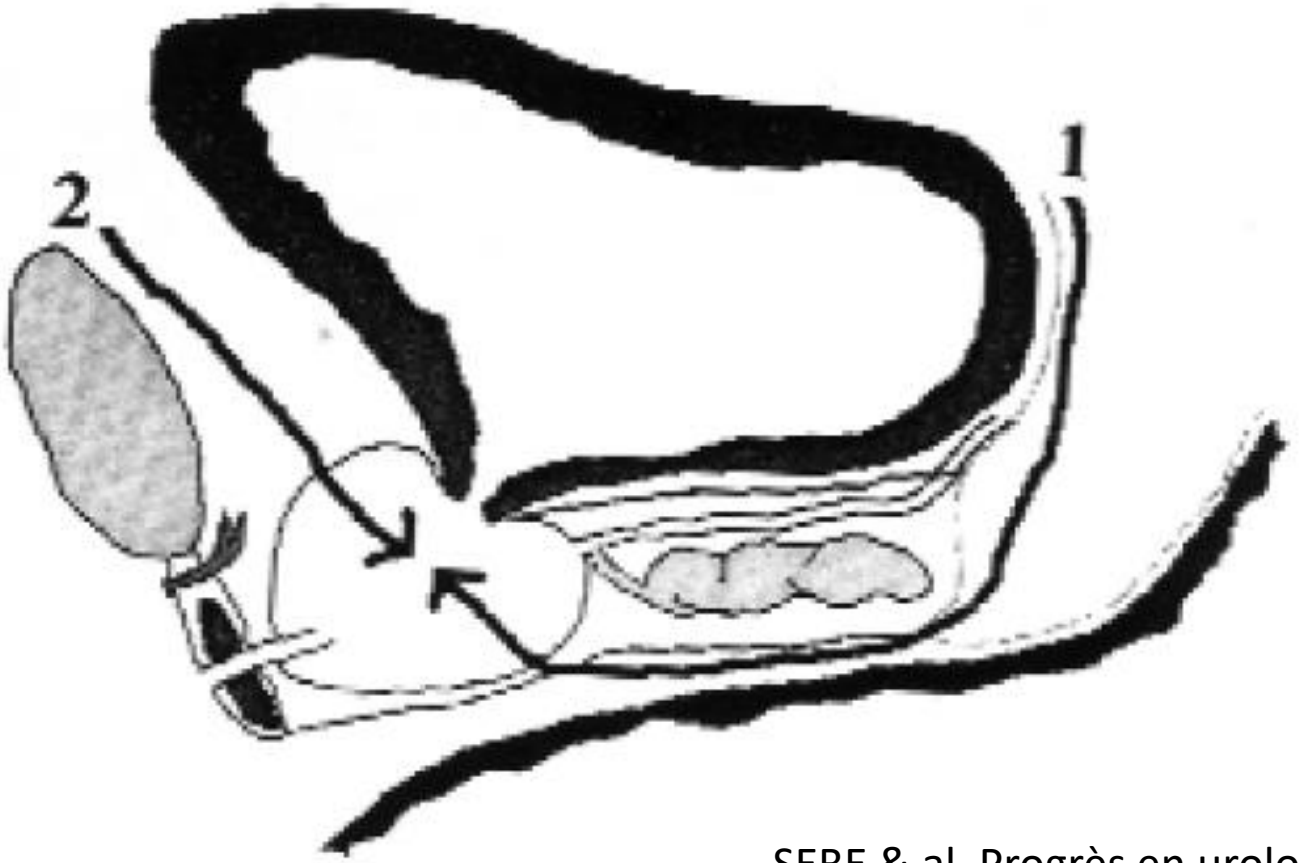

(A)
1
2
3


bladder
prostate
rectum
from
hypogastric
complex
prostatic
plexus
ureter
vas deferens
right pelvic
plexus
parasympathetic
nerves enter
from sacrum


prostate
rectum
seminal
vesicle
verumontanum
vas
deferens
pelvic
plexus

Transprostatic cystectomy with prostatic capsule sparing

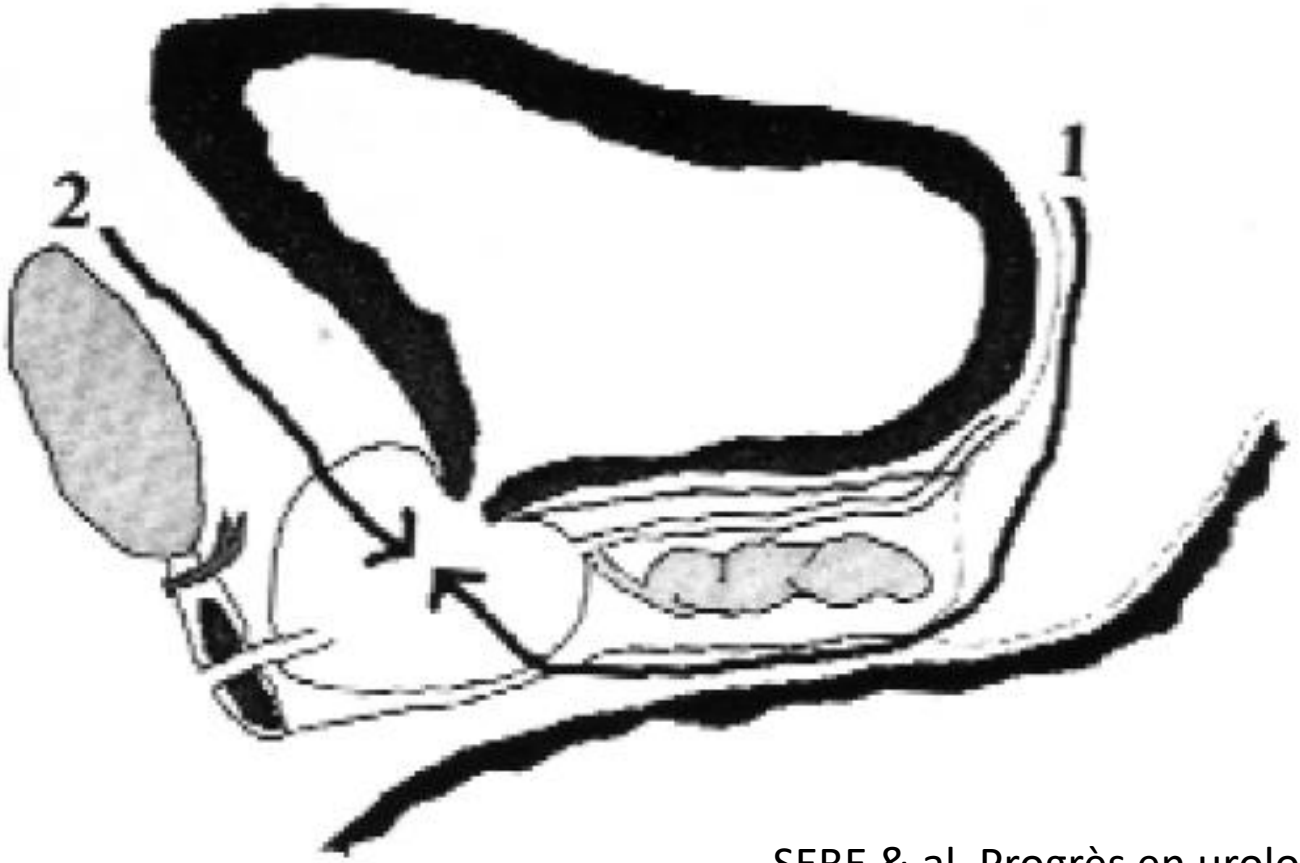
Before surgery : TURP & Bladder neck biopsy



SEBE & al, Progrès en urologie, 2003

Transprostatic cystectomy with prostatic capsule sparing

Before surgery : TURP & Bladder neck biopsy

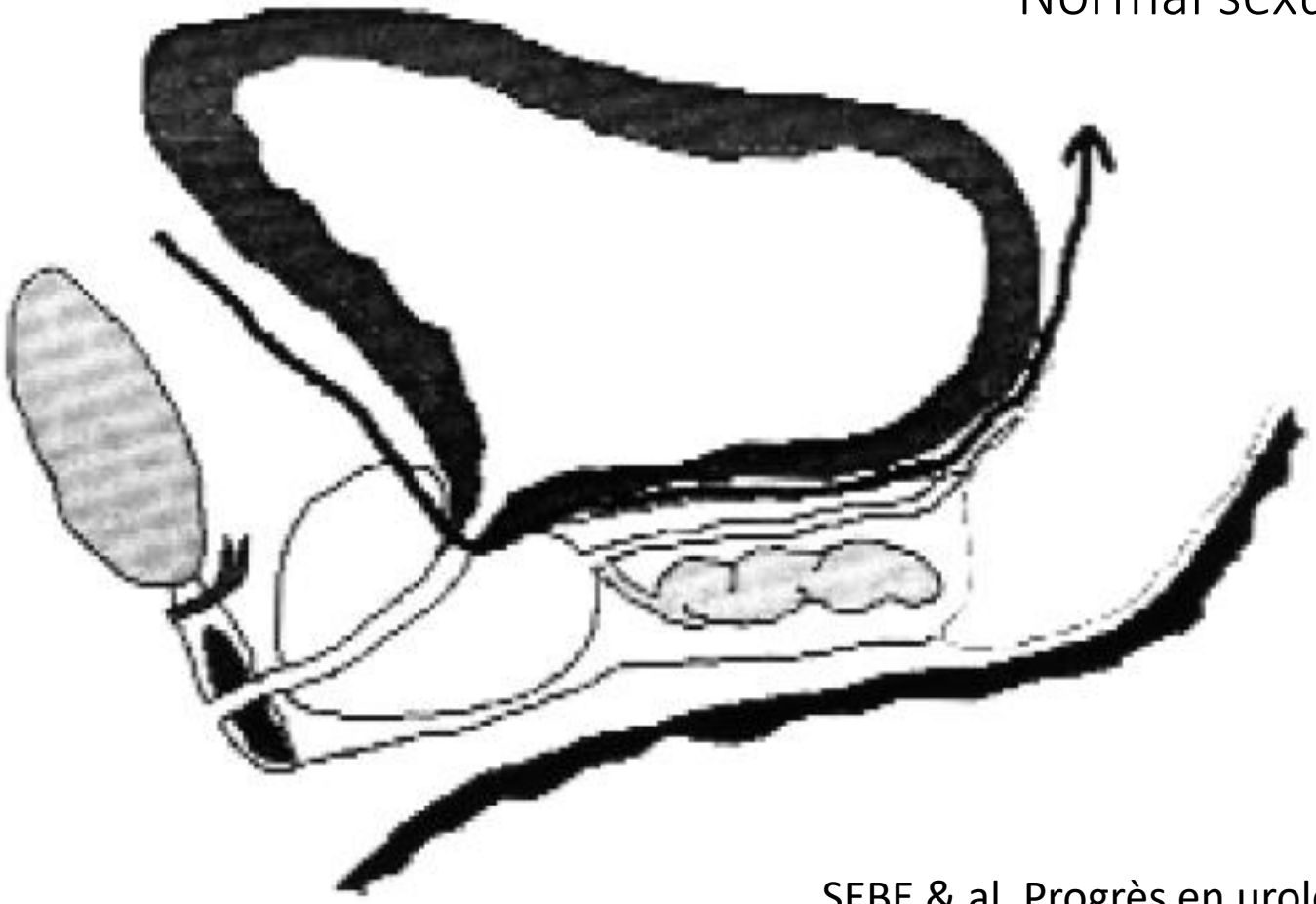


SEBE & al, Progrès en urologie, 2003

Maximum seminal vesicles and prostate sparing cystectomy

No TURP & Bladder neck biopsy needed

Anterograde ejaculation
Normal sexuality



SEBE & al, Progrès en urologie, 2003

Indications

COLOMBO :

- Young patients eagering erections.
- Superficial tumors non controlled by endovesical instillations.
- Corret PSA and no invasion of urethra or bladder neck.

VALLANCIEN & SHILLING :

- All cystectomies.
- Tx N0 M0.
- Correct PSA and no invasion of urethra or bladder neck.

HORENBLAS & MEINHARDT :

- All stages eagering sexuality.
- Correct PSA and no invasion of urethra or bladder neck.
- Systematic prostatic biopsies
- Neo adjuvant MVAC chemotherapy for all patients.

Case1

- 56 year old patient .
- Without particular history.
- ASA1, PS 0, BMI 26.
- Bladder cancer stated PT2N0M0, no Cis, no variant histologic.
- PSA=2.56ng/l
- IIEF at 3moths: moderate(11-17)

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Erection- and Ejaculation-Preserving Cystectomy With Orthotopic Urinary Diversion: Is It Feasible?

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ABSTRACT: Nerve-sparing techniques to preserve sexual function in men undergoing cystoprostatectomy have been documented by different centers. We evaluated the results of the first 4 erection- and ejaculation-preserving cystectomies performed in our department. The ages of patients ranged between 36 and 43 years. In all cases, patients wished to maintain sexual function. Of the cases, 3 patients had pT1 G3 transitional cell carcinoma (TCC) refractory to treatment and one had pT2a adenocarcinoma of the bladder. Extirpation of the bladder and anterior proximal prostate en bloc with preservation of the vasa deferentia, seminal vesicles, posterior prostate, and neurovascular bundles was performed after pelvic lymphadenectomy. W-ileal neobladder was performed by using 40 cm of ileum. All patients had erections at the third month. Of the cases, 2 patients had antegrade ejaculation. The ejaculate volumes were 0.8 and 1.2 mL in patients with antegrade ejaculation. Patients in the other cases had retrograde ejaculation. All patients were continent day and night. We started clean intermittent catheterization in 1 case because of residual urine. There were no local recurrences. One patient with TCC died because of systemic disease in the postoperative 32nd month. The most important drawback of potent cases in cystectomy decision is erectile dysfunction after radical cystectomy. This drawback causes delay of the operation and sometimes mortality. As was the case in other reports, our limited number of cases in this study demonstrated that erection and ejaculation could be preserved in selected groups of patients.

Key words: Bladder cancer, treatment, sexual function, prognosis.
J Androl 2006;27:263–267

ORIGINAL ARTICLE

ANDROLOGY WILEY

Effect of neurovascular bundle sparing radical cystectomy on post-operative continence and sexual function: A systematic review and meta-analysis

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Abstract

Background: It is unclear whether the neurovascular bundle (NVB) sparing could improve post-operative urinary continence and potency. Furthermore, concern remains regarding the impact of nerve-sparing (NS) radical cystectomy (RC) on oncological outcomes.

Objectives: The primary objective of this meta-analysis was to evaluate whether in men undergoing NS RC could improve post-operative urinary continence and potency. The secondary objective was to assess whether NS RC could compromise the oncological control.

Materials and methods: A systematic search of the PubMed and Web of Science was performed in February 2020, yielding 1446 unique records. A total of 13 comparative cohort studies were included. Risk of bias in each study was assessed separately by two authors using the Newcastle-Ottawa Scale (NOS).

Results: Data from 921 participants in 12 studies were synthesized in the present meta-analysis. Meta-analysis revealed that NS compared with non–nerve sparing (NNS) results in improved post-operative potency, daytime continence, and nocturnal continence. RRs were 9.35 ($P < .00001$) in potency, 1.11 ($P = .045$) in daytime continence, and 1.33 ($P = .002$) in nocturnal continence, respectively. Furthermore, no differences were found in the included studies reporting oncological outcomes. RRs were 0.88 ($P = .61$) in local and/or distant recurrence between two groups. A sensitivity analysis of prospective studies indicated consistent results.

Discussion and conclusion: This meta-analysis indicates that NS RC can improve post-operative potency, and daytime and nocturnal urinary continence, without compromising oncological control, compared with NNS RC in men.

BJUI
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Functional Urology

Nerve-sparing radical cystectomy has a beneficial impact on urinary continence after orthotopic bladder substitution, which becomes even more apparent over time

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Objective

To analyse urinary continence in long-term survivors after radical cystectomy (RC) and orthotopic bladder substitution (OBS) according to attempted nerve-sparing (NS) status.

Patients and Methods

We analysed 180 consecutive patients treated at our department between 1985 and 2007, who underwent RC with OBS, and survived ≥10 years after RC. We stratified patients by attempted NS status and evaluated continence outcomes using descriptive statistics and Cox proportional hazards regression models. A secondary analysis evaluated erectile function as a quality control for attempted NS.

Results

The median (interquartile range [IQR]) age at RC was 62 (57–71) years. Of 180 patients, attempted NS status was none in 24 (13%), unilateral in 100 (56%), and bilateral in 56 (31%). After a median (IQR) follow-up of 169 (147–210) months, 160 (89%) patients were continent during daytime and 124 (69%) during night-time. In multivariable analysis, any degree of attempted NS was significantly associated with daytime continence (odds ratio [OR] 2.08, 95% confidence interval [CI] 1.05–4.11; $P = 0.04$). Correspondingly, any attempted NS was significantly associated with night-time continence (OR 2.51, 95% CI 1.08–5.85; $P = 0.03$). Recovery of erectile function at 5 years was also significantly associated with attempted NS ($P < 0.001$).

Conclusion

Nerve-sparing during RC and OBS was associated with better long-term continence outcomes. This becomes more apparent as the patients age with their OBS. We advocate a NS RC whenever an OBS is considered.

Keywords

cystectomy, orthotopic bladder substitute, nerve sparing, urinary continence

Prostate Capsule Sparing versus Nerve Sparing Radical Cystectomy for Bladder Cancer: Results of a Randomized, Controlled Trial

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Purpose: Prostate capsule sparing and nerve sparing cystectomies are alternative procedures for bladder cancer that may decrease morbidity while achieving cancer control. However, to our knowledge the comparative effectiveness of these approaches has not been established. We evaluated functional and oncologic outcomes in patients undergoing these procedures.

Materials and Methods: We performed a single institution trial in patients with bladder cancer in whom transurethral prostatic urethral biopsy and transrectal prostate biopsy were negative. Men were randomized to prostate capsule sparing or nerve sparing cystectomy with neobladder creation and stratified by SHIM score (greater than 21 vs 21 or less). Our primary end point was 12-month overall urinary function as measured by BCI. Secondary end points included sexual function, cancer control and complications.

Results: A total of 40 patients were enrolled in the study with 20 patients in each arm. Urinary function at 12 months decreased by 13 and 28 points in the prostate capsule and nerve sparing groups, respectively ($p = 0.10$). Sexual function followed a similar pattern ($p = 0.06$). There was no difference in recurrence-free, metastasis-free or overall survival (each $p > 0.05$). The rate of incidentally detected prostate cancer was similar ($p = 0.15$).

Conclusions: Our study provides a randomized comparison of prostate capsule sparing and nerve sparing cystectomy techniques. We found no difference in functional or oncologic outcomes between the 2 approaches, although our study was underpowered due to a lack of patient accrual.

Abbreviations and Acronyms

BCI = Bladder Cancer Index

PSA = prostate specific antigen

SHIM = Sexual Health Inventory for Men

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Study received institutional review board approval.

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* Financial interest and/or other relationship with Urology.

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Conclusion

Cystectomy techniques with nerve sparing have two objectives:

- Improve the functional results of cystectomies , especially in young patients eagering to maintain erections

- Achieve cancer control at least equivalent to radical cystectomies.

the first objective seems to have been achieved, with an improvement in functional results particulary potency.

On the other hand, oncological control seems not equivalent; Local recurrences are not more frequent in the case of prostate preservation, but metastatic recurrences seems increased.

The indications for these techniques should probably be reduced and better defined.

Thank you for your attention.