POLICLINICO ABANO
PRESIDIO OSPEDALIERO REGIONE VENETO


# Cistectomia Radicale Nerve Sparing


## Dott. Daniele Romagnoli

*U.O. Urologia Robotica e Chirurgia Urologica*

*Mini-invasiva*

*Policlinico Abano Terme*

*Abano Terme (PD)*

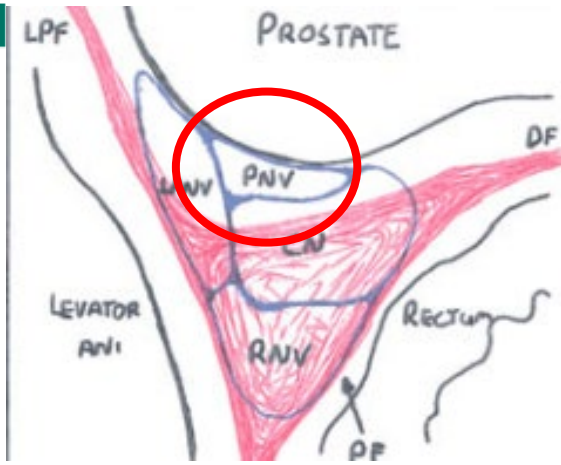
# Basi anatomiche: NVB - 1

Anatomical studies of the neurovascular bundle and cavernosal nerves

ANTHONY J. COSTELLO, MATTHEW BROOKS and OWEN J. COLE
*Department of Urology, Division of Surgery, University of Melbourne, The Royal Melbourne Hospital, Parkville, Victoria, Australia*

Accepted for publication 7 July 2004

 | 94, 1071–1076 | doi:10.1111/j.1464-410X.2004.05106.x




Organizzazione NVB:

1) Componente postero-laterale (fascia di Denonvillers e Fascia pararettale ) → Retto
2) Componente laterale → Elevatore dell'ano
3) Componente antero-laterale → Nervi cavernosi e supporto neurovascolare alla prostata

# Basi anatomiche: NVB - 2

World J Urol (2006) 24: 136–143
DOI 10.1007/s00345-006-0102-2

TOPIC PAPER

Atsushi Takenaka · Robert A. Leung
Masato Fujisawa · Ashutosh K. Tewari

**Anatomy of autonomic nerve component in the male pelvis: the new concept from a perspective for robotic nerve sparing radical prostatectomy**

*…branches of the hypogastric nerve and the pelvic splanchnic nerve are likely to interdigitate at multiple levels, showing spray-like arrangement without clear bundle formation…*

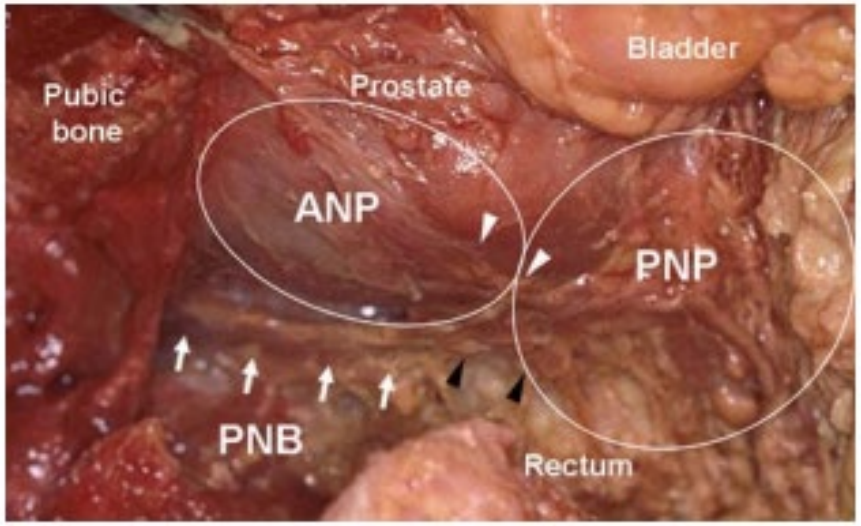


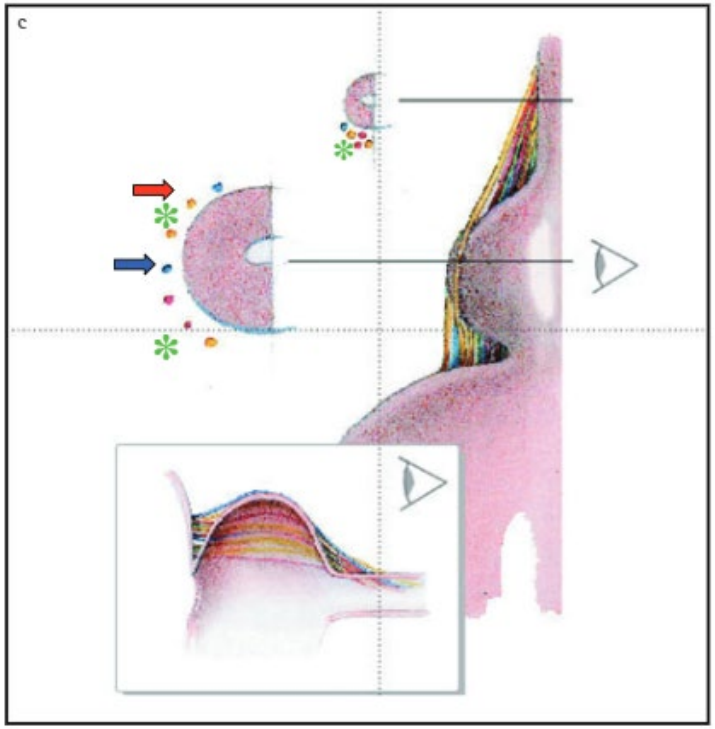

**Fig. 2** The tri-zonal concept of proximal neurovascular plate (*PNP*), predominant neurovascular bundles (*PNB*, *white arrows*), and accessory distal neural pathways (*ANP*). *White arrowheads* indicate the continuity of PNP and ANP, and *black arrowheads* are PNP and PNB. Fresh cadaver

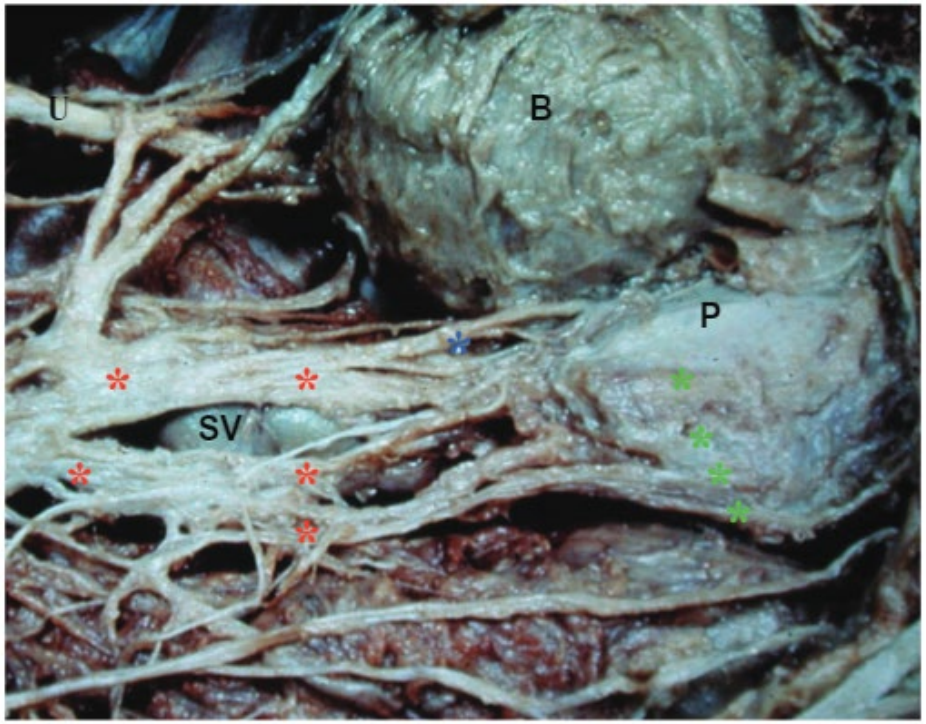
# Basi anatomiche NVB - 3

## Anatomical radical retropubic prostatectomy: 'curtain dissection' of the neurovascular bundle

ANDREAS LUNACEK, CHRISTIAN SCHWENTNER, HELGA FRITSCH*, GEORG BARTSCH and HANNES STRASSER
*Department of Urology and *Institute of Anatomy and Histology, Medical University, Innsbruck, Austria*

© 2005 BJU INTERNATIONAL | 95, 1226–1231 | doi:10.1111/j.1464-410X.2005.05510.x



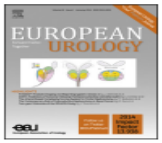



# Basi anatomiche Plesso Pelvico -1

EUROPEAN UROLOGY 70 (2016) 301–311

available at www.sciencedirect.com
journal homepage: www.europeanurology.com

European Association of Urology



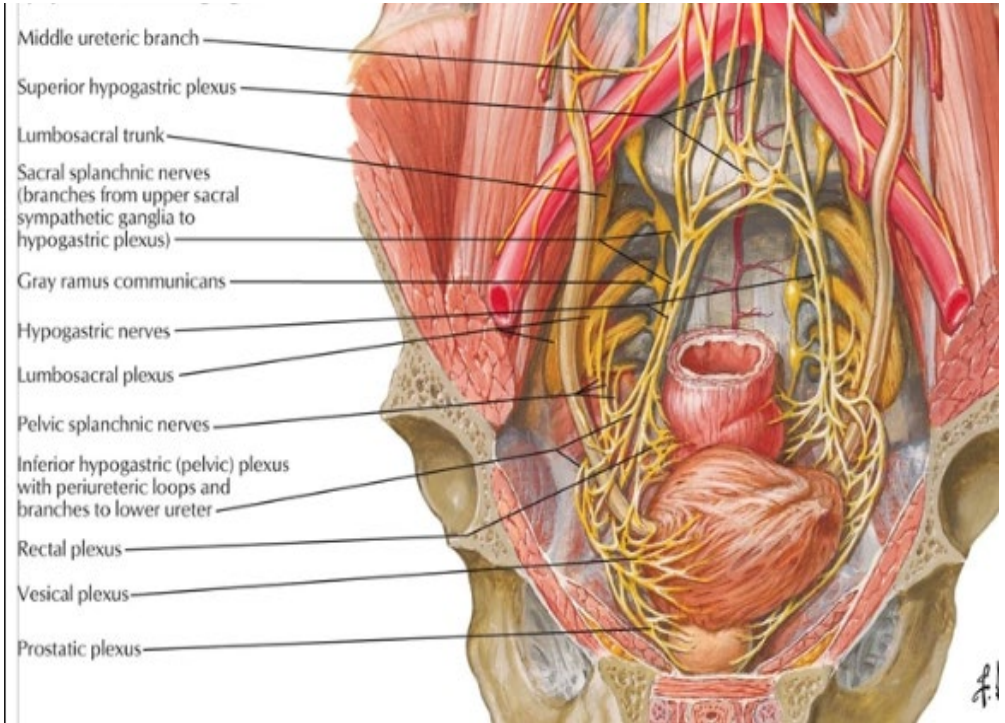

Collaborative Review – Prostate Cancer

**A Critical Analysis of the Current Knowledge of Surgical Anatomy of the Prostate Related to Optimisation of Cancer Control and Preservation of Continence and Erection in Candidates for Radical Prostatectomy: An Update**

*Jochen Walz [a,*], Jonathan I. Epstein [b], Roman Ganzer [c], Markus Graefen [d], Giorgio Guazzoni [e], Jihad Kaouk [f], Mani Menon [g], Alexandre Mottrie [h], Robert P. Myers [i], Vipul Patel [j], Ashutosh Tewari [k], Arnauld Villers [l], Walter Artibani [m]*

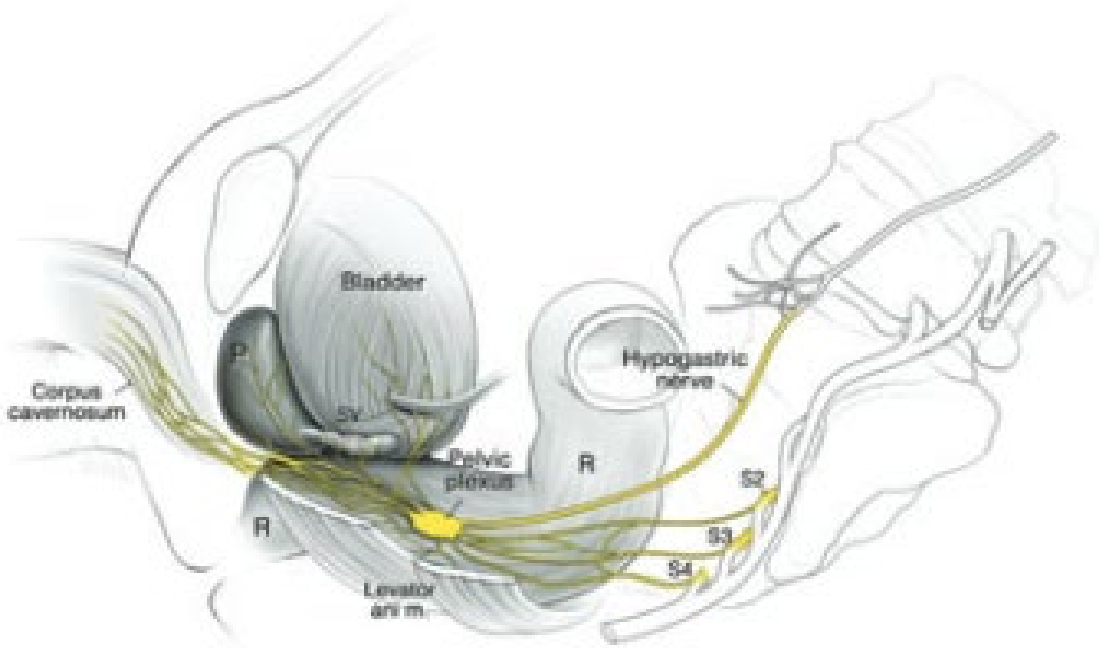
Il plesso pelvico regola:

1) Erezione
2) Eiaculazione
3) Continenza urinaria



# Basi anatomiche Plesso Pelvico -2

*FIG. 8.*
*Pelvic plexus; showing the multiple contributions of the pelvic plexus: rectum (R), levator ani, bladder (B), seminal vesicles (SV), prostate (P) and corpus cavernosum.*




*The pelvic plexus lies within a fibrofatty, flat, rectangular, sagittally oriented plate between the bladder and the rectum. PLND might be extended into this area…*

# Linee Guida EAU

| Recommendations | Strength rating |
|---|---|
| Offer sexual-preserving techniques to men motivated to preserve their sexual function since the majority will benefit. | Strong |
| Select patients based on:<br>• organ-confined disease;<br>• absence of any kind of tumour at the level of the prostate, prostatic urethra or bladder neck. | Strong |
| Do not offer sexual-preserving cystectomy as standard therapy for MIBC. | Strong |

| Recommendations | Strength rating |
|---|---|
| Offer sexual-preserving techniques to female patients motivated to preserve their sexual function since the majority will benefit. | Weak |
| Select patients based on:<br>• organ-confined disease;<br>• absence of tumour in bladder neck or urethra. | Strong |
| Do not offer pelvic organ-preserving radical cystectomy for female patients as standard therapy for MIBC. | Strong |

EAU Guidelines on

**Muscle-invasive and Metastatic Bladder Cancer**

J.A. Witjes (Chair), M. Bruins, E. Compérat, N.C. Cowan, G. Gakis, V. Hernández, T. Lebret, A. Lorch, M.J. Ribal (Vice-chair), A.G. van der Heijden, E. Veskimäe
Guidelines Associates: E. Linares Espinós, M. Rouanne, Y. Neuzillet



European Association of Urology

# Indicazioni

Asian Journal of Urology (2016) 3, 150–155

Available online at www.sciencedirect.com

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journal homepage: www.elsevier.com/locate/ajur

REVIEW

## Current status of laparoscopic and robot-assisted nerve-sparing radical cystectomy in male patients

Jian Huang*, Xinxiang Fan, Wen Dong

1) **Età < 65 anni**
2) **Stadio ≤ pT2** (assenza di coinvolgimento uretrale alla biopsia intraoperatoria)
3) **Assenza di sospetto di neoplasia prostatica** (DRE, PSA, mpMRI)
4) Pazienti **sessualmente attivi/e preoperatoriamente**
5) Pazienti candidate/e a **neovescica ortotopica**

# Nerve Sparing: Tecniche nel Maschio

1) **Cistoprostatovesciculectomia nerve sparing: asportazione di prostata, vescica e vescicole seminali, lasciando in sede i bundles neurovascolari (approccio intra-interfasciale)**
2) Cistectomia **Capsule Sparing**: tecnica che prevede, come primo atto, una TURP, e successivamente intervento di cistectomia lasciando in sede la capsula prostatica, le vescicole seminali ed i dotti deferenti
3) Cistectomia **Seminal Sparing**: conservazione di dotti deferenti, vescicole seminali e bundles neurovascolari
4) Cistectomia **Prostate Sparing**: preservazione di parte della prostata e di vescicole seminali, dotti deferenti e bundles neurovascolari

# Confronto tra le tecniche - 1

**Table 1** Functional outcomes of different techniques of nerve-sparing radical cystectomy.

| Study | Technique | Patients | Follow-up | Urinary continence | | Recovery of erectile function |
|---|---|---|---|---|---|---|
| | | | | Daytime | Night time | |
| Kessler *et al.*, 2004 [5] | NS-CVP | Bilateral: $n = 38$<br>Unilateral: $n = 218$<br>Non: $n = 75$ | 24 months | Attempted NS: 96%<br>Non NS: 88% | Attempted NS: 88%<br>Non NS: 74% | Bilateral: about 58%<br>Unilateral: about 32%<br>Non: about 12% |
| Colombo *et al.*, 2015 [8] | NS-CVP<br>CS-S<br>SS-CP | 35<br>36<br>19 | 24 months | 88.6%<br>97.2%<br>94.7% | 57.1%<br>83.3%<br>63.2% | Satisfactory erectile function rate (IIEF-5 $\geq$ 22) 28.6%<br>91.6%<br>84.2% |
| Canda *et al.*, 2012 [19] | NS-CVP | Bilateral: $n = 19$<br>Unilateral: $n = 1$<br>Non: $n = 1$ | About 6 months | 11 (73.3%) fully continent, 4 (26.6%) mild incontinence[a] | 3 (20%) good, 4 (26.7%) fair and 8 (53.3%) poor[a] | – |
| Jacobs *et al.*, 2015 [21] | NS-CVP | 20 | 37 months | At 12 months, average urinary function compared with baseline decreased by 13 $\pm$ 30 points | | Average sexual function at 12 months, decreased by 23 $\pm$ 30 points |
| | CS-C | 20 | 41 months | Decreased by 28 $\pm$ 33 points | | Decreased by 1 $\pm$ 11 points |
| Ong *et al.*, 2010 [23] | SS-CP | Bilateral: $n = 14$<br>Unilateral: $n = 17$ | 18 months | 27 out of 29 evaluable patients (93%) | 19 out of 29 evaluable patients (66%) | 15 out of 19 evaluable patients (79%) remained potent |

NS-CVP, nerve-sparing cysto-vesicle prostatectomy, CS-S, capsule-sparing cystectomy, SS-CP, seminal-sparing cysto-prostatectomy; IIEF, International index of erectile function.

[a] Only 15 patients were available for postoperative urinary continence evaluation.

# Confronto tra le tecniche - 2

Sexual outcomes were evaluated using validated questionnaires (International Index of Erectile Function [IIEF], Erection Hardness Scale [EHS], Bladder Cancer Index [BCI]) in eight studies. Post-operative potency was significantly better in patients who underwent any type of sexual-preserving technique compared to conventional RC ($p < 0.05$), ranging from 80-90%, 50-100% and 29-78% for prostate-, capsule- or nerve-sparing techniques, respectively. Data did not show superiority of any sexual-preserving technique.

Urinary continence, defined as the use of no pads in the majority of studies, ranged from 88 to 100% (day-time continence) and from 31-96% (night-time continence) in the prostate-sparing cystectomy patients. No major impact was shown with regard to continence rates for any of the three approaches.

# Outcomes Oncologici

Oncological outcomes did not differ between groups in any of the comparative studies that measured local recurrence, metastatic recurrence, disease-specific survival (DSS) and OS, at a median follow-up of three to five years. Local recurrence after SPC was commonly defined as any UC recurrence below the iliac bifurcation within the pelvic soft tissue and ranged from 1.2-61.1% vs. 16-55% in the control group. Metastatic recurrence ranged from 0-33.3%.

For those techniques preserving prostatic tissue (prostate- or capsule-sparing) rates of incidental prostate cancer in the intervention group ranged from 0 to 15%. In no case was incidental prostate cancer with Gleason score ≥ 8 reported.

*EAU MIBC Guidelines, 2018*

# Nerve Sparing: Tecniche nella Femmina

1) Cistectomia Nerve Sparing
2) Cistectomia Vagina Sparing
3) Cistectomia Genitalia Sparing

} **Pelvic Organ Preserving Radical Cystectomy (POPRC)**

# POPRC: Confronto tra le tecniche – Continenza

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Review | Free Access

## Systematic review of the oncological and functional outcomes of pelvic organ-preserving radical cystectomy (RC) compared with standard RC in women who undergo curative surgery and orthotopic neobladder substitution for bladder cancer

| References | Case, *n* | Type of diversion | Time analysed, months | Duration of follow-up, months, mean (range) or mean (SD) | Type of measurement | Daytime continence rate, % or *n/N)* | Night-time continence rate, % or *n/N* | Self-catheterisation rate, % |
|---|---|---|---|---|---|---|---|---|
| Chang et al. [14] | 21 | Neobladder | 6–12 | 12 (1–36) | Pad-test | 71 | NR | 9.5 |
| Ali-El-Dein et al. [15] | 13 | Hautmann neobladder | NR | 72 (37–99) | Self-impression | 13/13 | 12/13 | NR |
| Horenblas et al. [17] | 3 | Neobladder, | 6–12 | 42 (24–72) | Self-impression | 2/3 | 2/3 | NR |
| Koie et al. [18] | 30 | 'U'-shaped neobladder | 6–12 | 41 (4–98) | Pad-test | 93.3 | 80 | 0 |
| Kulkarni et al. [19] | 14 | Hautmann neobladder | 6–12 | 24.5 (12–65) | Pad-test | 9/14 | 7/14 | 29 |
| Nesrallah et al. [20] | 29 | 'J'-shaped neobladder | 1–6 | 37.5 (14-96) | Self-impression | 97 | 86 | 10 |
| Anderson et al. [21] | 51 | Neobladder | 6–12 | 37.2 (37.2) | Pad-test | 57.1 | 42.9 | 30.6 |
| Rouanne et al. [23] | 46 | 'Z'-shaped neobladder | 6–12 | 68 (6–204) | Pad-test | 64.5 | 71.0 | 29 |
| Gross et al. [24] | 73 | Neobladder | >12 | 64 (12–227) | Self-impression | 58.9 | NR | NR |
| Wishahi et al. [25] | 13 | 'U'-shaped neobladder | >12 | 132 (60–180) | Pad-test | 69.3 | NR | 30.7 |
| Moursy et al. [26] | 18 | Hautmann neobladder | 3, 6, 12 | 70 (39–95) | Self-impression | 100 | 89 | 22 |

# POPRC: Confronto tra le tecniche – Attività Sessuale

BJUI
BJU International

Review | Free Access

## Systematic review of the oncological and functional outcomes of pelvic organ-preserving radical cystectomy (RC) compared with standard RC in women who undergo curative surgery and orthotopic neobladder substitution for bladder cancer

Erik Veskimäe, Yann Neuzillet, Mathieu Rouanne, Steven MacLennan, Thomas B. L. Lam, Yuhong Yuan, Eva Compérat, Nigel C. Cowan, Georgios Gakis ... See all authors

| References | No. patients assessed, *n/N* | Age, years mean (range) | Type of diversion | Duration of follow-up, months, mean (range) | Measure | Sexual activity, % or *n/N* | Satisfaction, % or *n/N* | FSFI score (mean) |
|---|---|---|---|---|---|---|---|---|
| Neymeyer et al. [13] | 86/86 | NR | Neobladder | 36 (6–54) | Interview | 89.5 | 95.3 | NR |
| Ali-El-Dein et al. [15] | 12/15 | 42 (25–54) | Hautmann neobladder | 70 (37–99) | FSFI | 12/12 | 12/12 | 18 |
| Horenblas et al. [17] | 2/3 | 55 (38–71) | Neobladder | 42 (24–72) | Interview | NR | 3/3 | NR |
| Bhatt Dhar et al. [16] | 6/13 | 55.9 (52–59) | Neobladder | 13.2 (12–14) | FSFI | 6/6 | 5/6 | 22.3 |
| Rouanne et al. [23] | 31/46 | 64.8 (43–86) | 'Z'-shaped neobladder | 68 (6–204) | Contilife | 58 | NR | NR |
| Wishahi et al. [25] | 13/13 | 37.9 (20–54) | 'U'-shaped neobladder | 132 (60–180) | FSFI | 12/13 | NR | 23.7 |
| Moursy et al. [26] | 17/18 | 37.8 (32–43) | Hautmann neobladder | 70 (39–95) | Interview | 100 | 82 | NR |

# POPRC: Outcomes Oncologici

Survival outcomes were reported in seven studies on 197 patients, with a mean follow-up of between 12 and 132 months. At three and five years, CSS was 70-100% and OS was 65-100%, respectively. Positive surgical margins were reported in six studies, ranging from 0 to 13.7%. Local and metastatic recurrence rates were reported as ranging between 0-13% and 0-16.7%, respectively. Mean time to local recurrence was seven months.

*EAU MIBC Guidelines, 2018*

# POPRC: Linee Guida EAU

Although this SR provides the best evidence currently available, including basically all reported cases, the data remains immature. Most studies were retrospective and non-comparative with small numbers of patients included, meaning that any estimates are uncertain and likely to be biased. Heterogeneity in outcome definition, measurement and reporting hampers the usefulness of the current evidence base. The overall risk of bias was high across all studies. However, for well-selected patients, sparing female reproductive organs during RC appears to be oncologically safe and provides improved functional outcomes.

*EAU MIBC Guidelines, 2018*

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# Casistiche Robotiche - 1

EUROPEAN UROLOGY 67 (2015) 402–422

available at www.sciencedirect.com
journal homepage: www.europeanurology.com

European Association of Urology


RARC Pasadena Consensus Panel – Review

*Editorial by Monish Aron and Inderbir S. Gill on pp. 361–362 of this issue*

## Systematic Review and Cumulative Analysis of Oncologic and Functional Outcomes After Robot-assisted Radical Cystectomy

*Bertram Yuh [a,*], Timothy Wilson [a], Bernie Bochner [b], Kevin Chan [a], Joan Palou [c], Arnulf Stenzl [d], Francesco Montorsi [e], George Thalmann [f], Khurshid Guru [g], James W.F. Catto [h], Peter N. Wiklund [i,†], Giacomo Novara [j,†]*

# Casistiche Robotiche - 2

**Table 7 – Erectile function in robot-assisted radical cystectomy series**

| Reference | Institution | IDEAL stage | Cases, no. | Nerve-sparing surgery, % | Study design | Follow-up, mo | Method of data collection | Potency definition | Potency rate at follow-up |
|---|---|---|---|---|---|---|---|---|---|
| Mottrie et al, 2007 [9] | O.L.V.–Clinic | 2a | 27 | 29 | Retrospective | 10.2 | – | – | 86% |
| Murphy et al, 2008 [12] | Guy's Hospital | 2a | 23 | 20 | Retrospective | 17 | IIEF | IIEF >21 with or without PDE5-I | 75% |
| Palou Redorta et al, 2009 [20] | Barcelona Autonomous University | 2a | 9 | 100 | Retrospective | 7 | – | – | 100% |
| Akbulut et al, 2011 [32] | Ankara Ataturk Training and Research Hospital | 2a | 12 | 82 bilateral 9 unilateral | Not reported | 7.1 | IIEF | None provided | A single patient with IIEF >18 |
| Canda et al, 2012 [33] | Ankara Ataturk Training and Research Hospital | 2a | 27 | 89 | Not reported | 6 | IIEF | None provided | A single patient with IIEF >18 |
| Jonsson et al, 2011 [35] | Karolinska Institute | 2b | 36 | 55 | Prospective | 25 | IIEF | Adequate for penetration with or without PDE5-I | 41% at 12 mo 75% of patients having nerve sparing |
| Tyritzis et al, 2013 [56] | Karolinska Institute | 2b | 70 | 58 bilateral 8 unilateral | Retrospective | 12 | IIEF | Adequate for penetration with or without PDE5-I | 63% at 12 mo |

IIEF = International Index of Erectile Function; PDE5-I = phosphodiesterase type 5 inhibitor.

# Nerve Sparing e PLND

available at www.sciencedirect.com
journal homepage: www.europeanurology.com

European Association of Urology


Collaborative Review – Prostate Cancer

## A Critical Analysis of the Current Knowledge of Surgical Anatomy of the Prostate Related to Optimisation of Cancer Control and Preservation of Continence and Erection in Candidates for Radical Prostatectomy: An Update

*Jochen Walz[a,*], Jonathan I. Epstein[b], Roman Ganzer[c], Markus Graefen[d], Giorgio Guazzoni[e], Jihad Kaouk[f], Mani Menon[g], Alexandre Mottrie[h], Robert P. Myers[i], Vipul Patel[j], Ashutosh Tewari[k], Arnauld Villers[l], Walter Artibani[m]*

- Il plesso pelvico ed in particolare i nervi erigendi sono a rischio di lesione in corso di linfoadenectomia pelvica standard durante la dissezione nell'area della arteria iliaca interna, medialmente verso la parete vescicale
- Una linfoadenectomia più estesa può danneggiare le branche del plesso pelvico afferenti il plesso cavernoso
- Inoltre, in corso di linfoadenectomia pelvica estesa, sono a rischio i nervi in corrispondenza della loro origine in regione presacrale medialmente ai vasi iliaci comuni

# Raccomandazioni Tecniche - 1

EUROPEAN UROLOGY 64 (2013) 654–663

available at www.sciencedirect.com
journal homepage: www.europeanurology.com

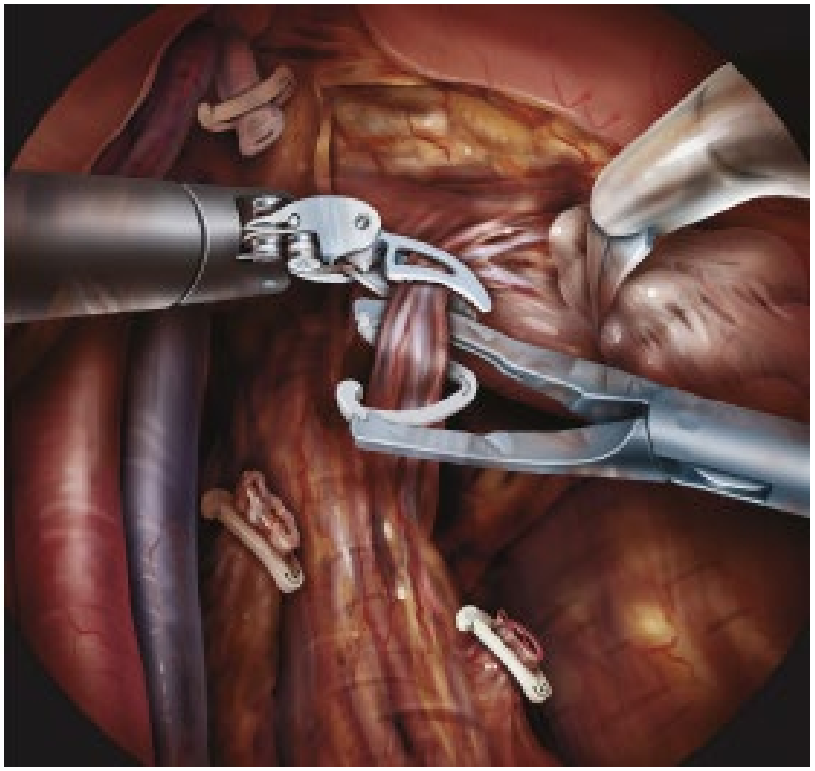
European Association of Urology


Surgery in Motion

## Robot-assisted Radical Cystectomy: Description of an Evolved Approach to Radical Cystectomy

*Justin W. Collins [1,*], Stavros Tyritzis [1], Tommy Nyberg, Martin Schumacher, Oscar Laurin, Dinyar Khazaeli, Christofer Adding, Martin N. Jonsson, Abolfazl Hosseini, N. Peter Wiklund [*]*

- **Dissezione il meno possibile traumatica**(Clips metalliche, Hem-o-lok, microcoagulazioni)
- Prestare **attenzione a non ledere i nervi in corrispondenza delle vescicole seminali e della base della prostata**



# Raccomandazioni Tecniche - 2

Asian Journal of Urology (2016) 3, 150–155

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/ajur


REVIEW

## Current status of laparoscopic and robot-assisted nerve-sparing radical cystectomy in male patients

Jian Huang*, Xinxiang Fan, Wen Dong

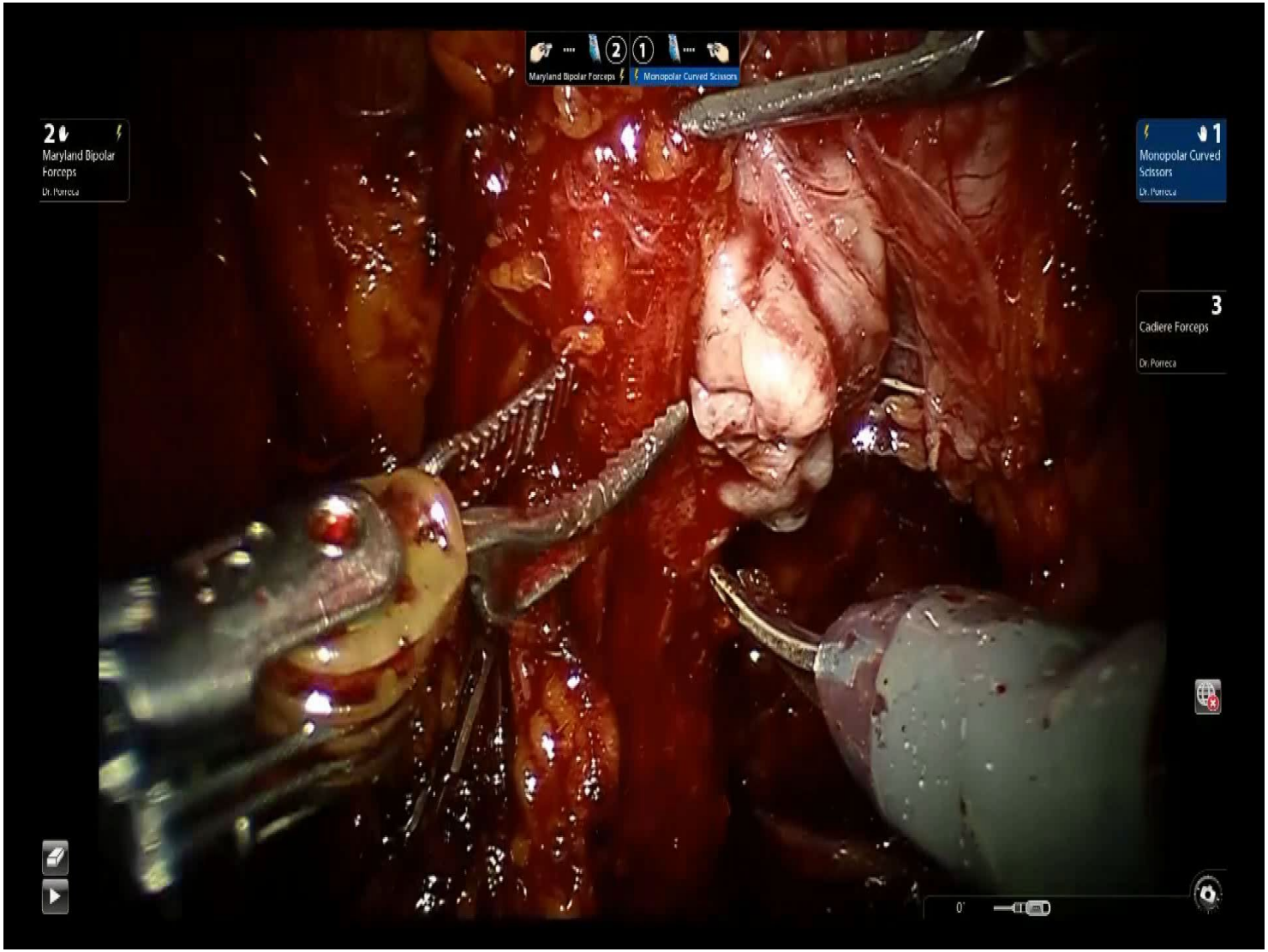
- We should attempt to perform at least one side nerve-sparing cystectomy
- Unilateral nerve-sparing should be considered on the nontumor- bearing side
- Bilateral nerve-sparing may be considered in patients with high risk non-muscle invasive disease or invasive tumors at anterior wall or dome of the bladder

# Our Experience - 1

- Luglio 2015 – Dicembre 2018
- 100 RARC
- 49 Pazienti sottoposti a RARC con approccio nerve sparing
- 17 procedure nerve sparing bilaterali (34%)
- 32 procedure nerve sparing monolaterali (66%)

- 31 (63%) pazienti con IIEF-5 > 18 (15 nerve sparing bilaterali, 16 nerve sparing monolaterali) a 6 mesi

# Our Experience - 2



# Take Home Messages

- Dall'analisi dei dati in Letteratura, le tecniche di Cistectomia Radicale con approccio Nerve Sparing consentono un **miglioramento della preservazione della funzione sessuale, rispetto alla procedura standard, senza compromettere i risultati oncologici**
- La **magnificazione visiva** tipica dell'**approccio mini-invasivo** (in particolare **robotico**) **agevola la esecuzione delle procedure nerve sparing**
- **Non vi sono evidenze statisticamente significative**, al momento, della **superiorità di una tecnica nerve sparing rispetto alle altre**
- La assenza di casistiche numericamente e statisticamente «robuste» **limita la indicazione di tale tipo di procedura a pazienti estremamente selezionati e motivati**

# *Grazie per l'Attenzione!!!*