Tips and Tricks in Urooncologic Surgery:

Robotic-Assisted Radical Prostatectomy Surgical Technique

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Procedural Steps

• Steep Trendelenberg Position
• Yellow fin stirrups – low lithotomy
• 6 port technique
• Verres needle at umbilicus
• Transperitoneal approach
Procedural Steps

• Bladder takedown
• Open endopelvic fascia
• Divide bladder neck
  – Deflate foley and pick up on bladder
• Expose seminal vesicles
  – Begin medial to the vasa and develop posterior plane
• Divide Denonviller’s fascia transversely and develop space between prostate and rectum
Procedural Steps

• Control pedicles with clips
  – Hemo-Lock
• *Separate NVB from prostate
• *Divide Dorsal vein
  – Ligate if excessive bleeding impairs view of urethra and prostatic apex
• *Divide urethra with scissors
• PLND (* if time)
• *Posterior reconstruction
• *Vesicourethral anastomosis
• *Suprapubic tube
Techniques

- Nerve Sparing
  - Standard
  - Veil – Scissors
  - Veil – Harmonic
- DV
- Anastomosis
  - Original double layer
  - V-lock Double layer
- SP Tube
Nerve Sparing Approach: Veil of Aphrodite

- Nerve Sparing
  - Standard
  - Veil
    - Veil-harmonic
- DV division
- Anastomosis
  - Original
  - V-lock
- SP Tube
Nerve Distribution along the Prostatic Capsule

Christian Eichelberg *, Andreas Erbersdobler, Uwe Michl, Thorsten Schlomm, Georg Salomon, Markus Graefen, Hartwig Huland

Department of Urology, University Hospital Eppendorf, Hamburg, Germany

Fig. 1 – Whole-mount section of prostate with sector borders.

50-65% in 4/5 and 8/9,
21-28% above horizontal
Standard Nerve Sparing
Anastomosis

- Multiple techniques available
- Interrupted sutures
- Running (van Veltoven type)
- Monofilament suture
- Barbed suture
- Single vs. double layer
- Anterior reconstruction
Assessment of Early Continence After Reconstruction of the Periprostatic Tissues in Patients Undergoing Computer Assisted (Robotic) Prostatectomy: Results of a 2 Group Parallel Randomized Controlled Trial

Mani Menon, Fred Muhletaler, Miguel Campos and James O. Peabody

From the Vattikuti Urology Institute, Henry Ford Hospital, Detroit, Michigan (MM, FM, JOP), Case School of Medicine, Cleveland, Ohio (MM), New York University School of Medicine, New York, New York (MM), and Department of Mathematics, Peruian University, Cayetano Heredia, Lima, Peru (MC)

0 pads (0 gr/day leak)

<table>
<thead>
<tr>
<th>Days after catheter removal</th>
<th>Double Layer</th>
<th>Single Layer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1d</td>
<td>15%</td>
<td>7%</td>
</tr>
<tr>
<td>2d</td>
<td>14%</td>
<td>14%</td>
</tr>
<tr>
<td>7d</td>
<td>20%</td>
<td>16%</td>
</tr>
<tr>
<td>31d</td>
<td>42%</td>
<td>47%</td>
</tr>
</tbody>
</table>

0-1 pad (<30 g/day leak)

J Urol 180, 1018-1023, 2008
Long-term Functional Urinary Outcomes Comparing Single- vs Double-layer Urethrovesical Anastomosis: Two-year Follow-up of a Two-group Parallel Randomized Controlled Trial

Jesse D. Sammon, Fred Muhletaler, James O. Peabody, Mireya Diaz-Insua, Ramgopal Satyanaryana, and Mani Menon

(BNC) rate: 4% vs 0%

Table 2. Functional characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Group 1 Single-layer</th>
<th>Group 2 Double-layer</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients</td>
<td>50</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>Follow-up (mo), mean (± SD)</td>
<td>23.5 (0.15)</td>
<td>23.5 (0.14)</td>
<td>.933</td>
</tr>
<tr>
<td>BNC, n (%)</td>
<td>2 (4.0%)</td>
<td>0 (0.0%)</td>
<td>.496</td>
</tr>
<tr>
<td>Urine weight at 30 d, median (IQR)</td>
<td>7.5 (0–100)</td>
<td>10.5 (0–65.8)</td>
<td>.798</td>
</tr>
<tr>
<td>IPSS variables at 2 years, mean (± SD)</td>
<td>4.5 (3.2)</td>
<td>3.5 (3.1)</td>
<td>.098</td>
</tr>
<tr>
<td>Total IPSS</td>
<td>4.9 (6.5)</td>
<td>3.4 (6.3)</td>
<td>.262</td>
</tr>
<tr>
<td>Total IPSS decrease</td>
<td>1.3 (1.1)</td>
<td>1.1 (1.2)</td>
<td>.412</td>
</tr>
<tr>
<td>IPSS bother score*</td>
<td>0.5 (1.7)</td>
<td>0.1 (1.7)</td>
<td>.296</td>
</tr>
<tr>
<td>Pad usage at 2 years, n (%)</td>
<td>40 (80.0)</td>
<td>38 (82.6)</td>
<td>.596</td>
</tr>
<tr>
<td>None</td>
<td>6 (12.0)</td>
<td>6 (13.0)</td>
<td></td>
</tr>
<tr>
<td>Safety pad</td>
<td>2 (4.0)</td>
<td>2 (4.0)</td>
<td></td>
</tr>
<tr>
<td>1 (ADL = 8 g)</td>
<td>2 (4.0)</td>
<td>2 (4.0)</td>
<td></td>
</tr>
<tr>
<td>2 (ADL = 40 g)</td>
<td>2 (4.0)</td>
<td>0 (0)</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2. Urinary continence outcomes at 1 month and 2 years. At 2 year follow-up 90/96 patients had no measurable leakage. Four patients leaked an average of 8 grams/day. Two patients (both >75 years old) in the single layer group leaked an average of 40 grams/day.

IQR: interquartile range; ADL, average daily leakage weight.
* This question: “If you were to spend the rest of your life with your urinary condition the way it is now, how would you feel about it” incorporates issues of leakage when concerning follow-up.
Posterior Rhabdosphincter Reconstruction During Robotic Assisted Radical Prostatectomy: Results From a Phase II Randomized Clinical Trial

Douglas E. Sutherland, Brian Linder, Anna M. Guzman, Mark Hong, Harold A. Frazier, II, Jason D. Engel* and Fernando J. Bianco, Jr.†

Table 2. I-PSS and pad weight data

<table>
<thead>
<tr>
<th></th>
<th>Controls Median, Mean (IQR)</th>
<th>PRR Median, Mean (IQR)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-PSS:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Days</td>
<td>45</td>
<td>13, 12 (7–15)</td>
<td>47</td>
</tr>
<tr>
<td>6 Wks</td>
<td>43</td>
<td>9, 11 (5–15)</td>
<td>46</td>
</tr>
<tr>
<td>3 Mos</td>
<td>41</td>
<td>6, 8 (3–12)</td>
<td>46</td>
</tr>
<tr>
<td>24-Hr pad wt</td>
<td>6 Wks</td>
<td>42, 133 (11–195)</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>3 Mos</td>
<td>0, 50 (0–15)</td>
<td>46</td>
</tr>
</tbody>
</table>

Figure 2. Bars demonstrating patient answers to EPIC questions 1, 5 and 12. EPIC question 5 answers include those who met continence definition and those who were free from pads, with p values at top evaluating significance of differences in answers registered in RCT.

J Urol 185, 1262-1267, 2011
Impact of Posterior Musculofascial Reconstruction on Early Continence After Robot-Assisted Laparoscopic Radical Prostatectomy: Results of a Prospective Parallel Group Trial

Neil Joshi a,b, Willem de Blok a, Erik van Muilekom a, Henk van der Poel a,*

Fig. 1 - Schematic representation of the median fibrous raphe reconstruction (MFRR).

Conclusions: No significant difference in any of the analysed outcome measures was observed. Posterior reconstruction of the musculofascial complex does not appear to improve early urinary incontinence after RALP.
Anastomosis During Robot-assisted Radical Prostatectomy: Randomized Controlled Trial Comparing Barbed and Standard Monofilament Suture

Jesse Sammon, Tae-Kyung Kim, Quoc-Dien Trinh, Akshay Bhandari, Sanjeev Kaul, Shyam Sukumar, Craig G. Rogers, and James O. Peabody

- 64 patients randomized to standard monofilament vs. barbed suture
- Anastomotic time reduced from 14 to 10 minutes
- Other functional outcomes equivalent
  - Leak rate
  - Pad use
V-lock anastomosis
Impact of Percutaneous Suprapubic Tube Drainage on Patient Discomfort after Radical Prostatectomy

Louis Spencer Krane, Mahendra Bhandari *, James O. Peabody, Mani Menon

Vattikuti Urology Institute, Henry Ford Health Systems, Detroit, MI, USA

Table 2 – Range of Faces Pain Score-Revised (FPS-R) scores in both groups of patients at days 2 and 6 following surgery

<table>
<thead>
<tr>
<th>FPS-R</th>
<th>Control</th>
<th>PST</th>
<th>p value (Fisher exact two-tailed test)</th>
<th>Control</th>
<th>PST</th>
<th>p value (Fisher exact two-tailed test)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-10</td>
<td>0</td>
<td>0</td>
<td>NA</td>
<td>0</td>
<td>0</td>
<td>NA</td>
</tr>
<tr>
<td>7-8</td>
<td>8 (16%)</td>
<td>4 (1.99%)</td>
<td>&lt;0.001</td>
<td>0</td>
<td>0</td>
<td>NA</td>
</tr>
<tr>
<td>5-6</td>
<td>9 (18%)</td>
<td>11 (5.4%)</td>
<td>0.007</td>
<td>4 (8%)</td>
<td>3 (1.5%)</td>
<td>0.03</td>
</tr>
<tr>
<td>3-4</td>
<td>19 (38%)</td>
<td>26 (12.9%)</td>
<td>&lt;0.001</td>
<td>12 (24%)</td>
<td>11 (5.4%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>1-2</td>
<td>13 (26%)</td>
<td>125 (61.9%)</td>
<td>&lt;0.001</td>
<td>22 (44%)</td>
<td>68 (33.7%)</td>
<td>0.189</td>
</tr>
<tr>
<td>0</td>
<td>1 (2%)</td>
<td>36 (17.8%)</td>
<td>&lt;0.001</td>
<td>12 (24%)</td>
<td>120 (59.4%)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

NA = not applicable; PST = percutaneous suprapubic tube.

- 2/202 patients required DVIU or urethral dilation
- Post-op pain scores better than with foley catheter
Suprapubic tube placement

• >90% of patients leave hospital on POD #1 without a foley catheter draining the bladder
One patient with total incontinence out of 493 (>2 pads)
Summary

• EPLND can increase nodal yield
• Internal iliac and obturator LN packages increase yield of positive nodes
• Therapeutic benefit remains to be proved
3 - Completed internal iliac-obturator lymphadenectomy on the left side compared with cadaveric dissection: (1) obturator artery; (2) internal iliac artery; (3) inferior vesical artery; (4) superior vesical artery; (5) inferior gluteal artery; (6) superior gluteal artery; (7) lateral sacral artery.

Table 4 – Lymph node metastases by type of node dissection

<table>
<thead>
<tr>
<th></th>
<th>Zone 1 (external iliac/obturator)</th>
<th>Zone 2 (internal iliac)</th>
<th>Zones 1 and 2 (extended)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of patients</td>
<td>1006</td>
<td>90</td>
<td>55</td>
</tr>
<tr>
<td>Preoperative PSA level, ng/dl (SD)</td>
<td>6.1 (2.9)</td>
<td>5.1 (1.8)</td>
<td>7.4 (4.3)</td>
</tr>
<tr>
<td>Biopsy Gleason score (SD)</td>
<td>6.6 (0.8)</td>
<td>6.2 (0.9)</td>
<td>7.5 (0.8)</td>
</tr>
<tr>
<td>cT1, no. (%)</td>
<td>755 (75%)</td>
<td>90 (100%)</td>
<td>41 (25%)</td>
</tr>
<tr>
<td>No. of nodes removed</td>
<td>6.4</td>
<td>5.5</td>
<td>12.3</td>
</tr>
<tr>
<td>Positive lymph nodes, no. (%)</td>
<td>5 (0.5%)</td>
<td>6 (6.7%)</td>
<td>6 (10.9%)</td>
</tr>
<tr>
<td>Partin 2007 prediction</td>
<td>0–1%</td>
<td>N/A</td>
<td>4–11%</td>
</tr>
</tbody>
</table>

cT1 = Clinical T1 stage; PSA = prostate-specific antigen.
Extended Lymph Node Dissection

**Figure 1**- Depiction of three anatomical zones involved in ELND as defined by Studer et al.

**Figure 2**- Console view of Zone 1: External Iliac, Zone 2: Obturator fossa and Zone 3: Hypogastric.
Techniques discussed

• Nerve Sparing
  – Standard
  – Veil – Scissors
  – Veil – Harmonic
• DV
• Anastomosis
  – Original double layer
  – V-lock Double layer
• SP Tube
• PLND
Veil Nerve Sparing - scissors
Pelvic lymph node dissection

- European data showing much higher rates of lymph node yield and lymph node involvement
- Questions of extent of LND
  - Boundaries
- Nature of population studied
  - Screened vs. unscreened
• Are rates of LN positivity based on inadequate templates?
• Should we omit PLND in some (any) patients?
• Should more extensive LND be performed in higher risk patients?
• Is there a therapeutic benefit?
  – Or is this only a diagnostic procedure
• If you use a smaller template you will find fewer nodes and conclude that LND is not needed
• If you use a larger template you will find more positive nodes and conclude that LND is necessary
• Self-fulfilling prophesy
PLND at VUI

• We perform PLND in most patients (85%)
• We have performed PLND in all high risk patients
• We now perform extended PLND in all high risk patients
  – Obturator, and internal iliac
  – external iliac ?
• Limited Internal Iliac dissection in low risk patients
• Role of pathologist
Pelvic lymph node dissection

- Lodde et al (AUA #552)
  - Harris, Wood, Fradet
  - T1-2, PSA <10ng/mL
- EPLND gave 6% positive nodes vs. 1.2% for SPLND
- PSA PFS was twice as likely with EPLND (HR=2.11)
- Type of PLND was stronger independent predictor than p Stage, Gleason ≥ 7 and positive margin
- Schumacher et al (Studer) European Urology
  - Good survival in patients with 1-2 Positive nodes
  - Mean 22 nodes
No Benefit to EPLND

- Vanderbilt University
  - 123 patients
  - J Urol 169:146, 2003
  - Compared extended vs. limited dissection in same patients
    - 72% - T1c,
    - 88% ≤Gleason 7
    - No increased node positivity with EPLND
    - 3.2% vs. 2.4%

- CCF
  - 336 patients
  - Urology 63(3):528, 2004
  - Compared 140 low risk patients that underwent PLND to 196 patients that had no PLND
    - 1 (0.8%) patient had nodal metastases
    - Six year bDFS was 86% with PLND and 88% in no-PLND groups
Benefit to Extended PLND

- Compared outcomes between two JHU surgeons with ext LND vs. limited LND (4000 patients)
- Similar patient features
- Ext LND included obturator plus hypogastric
- Extended LND yielded 11.6 nodes/case versus 8.9 nodes per case
- Positive LN’s in 3.8% vs. 1.2%
- In patients with <15% pos nodes, 5 year buffs was 42.9% versus 10.0%

J Urol 172:1840, 2004
## Extended vs. Standard PLND

<table>
<thead>
<tr>
<th></th>
<th>SLND (27)</th>
<th>ELND (55)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Mean) [SD]</td>
<td>61 [7.1]</td>
<td>62 [7.1]</td>
<td>0.36</td>
</tr>
<tr>
<td>Serum PSA (Mean) [SD]</td>
<td>6.06 [2.9]</td>
<td>6.36 [4.3]</td>
<td>0.71</td>
</tr>
<tr>
<td>Mean Biopsy Gleason (Mean; Mode) [SD]</td>
<td>6.8; 6 [0.8]</td>
<td>7.1; 7 [0.8]</td>
<td>0.25</td>
</tr>
<tr>
<td>OR time (Mean) [SD]</td>
<td>186 [49]</td>
<td>200 [41]</td>
<td>0.65</td>
</tr>
<tr>
<td>Blood loss (Mean) [SD]</td>
<td>175 [134]</td>
<td>168 [131]</td>
<td>0.84</td>
</tr>
<tr>
<td>Hospital Stay (Mean)</td>
<td>1.1</td>
<td>1.06</td>
<td>0.32</td>
</tr>
<tr>
<td>LN Related Complications</td>
<td>0</td>
<td>0</td>
<td>------</td>
</tr>
<tr>
<td>Mean LN Yield overall</td>
<td>5.2 sd3.2 [1-12]</td>
<td>8.3 sd 6.5 [1-45]</td>
<td>0.005</td>
</tr>
<tr>
<td>Mean LN Yield with GU Pathologist</td>
<td>6.8</td>
<td>12.4</td>
<td>0.003</td>
</tr>
<tr>
<td>Node Positive Rate</td>
<td>0.7%</td>
<td>2.02%</td>
<td>OR 2.6</td>
</tr>
</tbody>
</table>
Current Criteria for Extended Lymph Node Dissection

- Patients require any one of the following:
  - Primary Gleason 4
  - T2 or greater
  - PSA >10
  - More than 3 cores positive
  - 50% or higher in any one core
- Extended LND gives node yield of 12-18 nodes
Veil- Harmonic
All patients with pre-op SHIM=18+ who attempted intercourse

Stratified by nerve-sparing

Cumulative Incidence of Potency in Patients after RARP

Post-op

Stratified by nerve-sparing

Cumulative Incidence of Potency in Patients after RARP

+ Censored

Legranp <.0001

nerve

1: STANDARD

2: VEILS

3: WIDE
All patients with pre-op SHIM=18+ who attempted intercourse stratified by post-op PDE-5i Use