Open Radical Cystectomy Tips and Tricks in Males and Females

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10th Urooncology Congress – Antalya, Turkey
October 26-30, 2011
What I Will Cover

• Set up and initial exploration
• Dissection and handling the ureters
• Pelvic and iliac node dissection
• Ligating the lateral pedicles
• Posterior plane of dissection
• Nerve sparing
• Anterior vagina dissection
• Use of omentum

Figures from Stein, Skinner BJUI 2004
Treatment Goals

• Sterilize the regional tumor
  – Radical cystectomy and pelvic lymphadenectomy
  – Bladder sparing treatments

• Control occult regional and distant metastases
  – Neo-adjuvant and adjuvant chemotherapy

• Preserve functional voiding per urethra or by a continent catheterizable stoma

• Minimize treatment related morbidity
Radical Cystectomy
How Much to Take?

• Male: Bladder, prostate, seminal vesicles
  – Prostate, seminal vesicle sparing???

• Female: Bladder, ovaries, uterus/cervix, anterior vagina
  – Recent studies show low incidence of gyn organ involvement (J Urol 168:147, 2002)

• Pelvic lymph nodes: Minimum must include bilateral external iliac, hypogastric, obturator
  – Extended includes: Pre-sacral and common iliac
Peritoneal Incisions

- Incise white line of Toldt half way to hepatic/splenic flexure
- Mobilize terminal ileum mesentery up to duodenum
- Facilitates neobladder mobility and bowel anastomosis
Mobilize the Sigmoid Mesentery

- Dissect proximally to the IMA
  - Exposes the proximal node dissection
  - Wide path for left ureter to come over to the right pelvis
- Dissect distally to expose the pre-sacral space
Is there a stage benefit in performing an extended lymph node dissection during radical cystectomy for urothelial carcinoma of the bladder?

**Methods**

![Lymphatic drainage of the bladder](image.png)

*Figure 1. Lymphatic drainage of the bladder. The collecting ducts of the trigone and posterior wall drain into the external iliac nodes. Occasionally, the posterior ducts drain into the hypogastric or common iliac lymph nodes. The collecting ducts of the anterior bladder wall follow the middle vesical and umbilical arteries. Some merge with the posterior collecting ducts and drain into the external iliac lymph nodes, and the remaining vessels drain into the hypogastric and common iliac lymph nodes. (Adapted from Bettezzati M, Donini I: The Lymphatic System. New York, John Wiley & Sons, 1972, pp 380–386; with permission.)*
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Standard

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Methods

- Standard
- Extended
Results – BCM Data

• Extended LND includes pre-sacral, CI and distal aorta/IVC nodes
  – increases node yield by 34-40%
  – 36-43% of P3,P4N+ have node metastasis above CI bifurcation

5-yr Survival

<table>
<thead>
<tr>
<th>Site of N+</th>
<th>Ca spec</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pelvis only</td>
<td>44%</td>
<td>54%</td>
</tr>
<tr>
<td>CI or above</td>
<td>27%</td>
<td>37%</td>
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PLND Boundaries
Standard Dissection

- Proximal – CI bifurcation
- Distal – Cooper’s ligament; LN of Cloquet
- Lateral – genitofemoral nerve
- Medial – Bladder
- Posterior – hypogastric vein/floor of obturator fossa
Extent of Lymphadenectomy

Proximal extent of dissection
“Extended”

Pelvic portion of dissection
“Standard”
Pre-Sciatic Fossa
aka Fossa of Marseilles
Tuttle (Singley) forceps

Fossa of Marselles
Pre-sacral Fossa

- Direct lymphatic drainage from the trigone/posterior bladder
- Boundaries: medial border of right CI artery; inferior and medial margin of left CI vein; Sigmoid mesentery
- Do not dissect below the pre-sacral fascia
  - Minimize bleeding risk form pre-sacral veins
Expose the External Iliac Vessels

- Need to divide the peritoneum overlying the external iliac vessels and divide the vas
- Connects the transperitoneal and retroperitoneal/pelvic portions of the lymphadenectomy
Completing PLND and Lateral Pedicle

- Circumferentially mobilize the external iliac artery and vein
- Dissect lymphatic tissue down to Coopers ligament
- Pass sponge along pelvic sidewall into obturator fossa
- Dissect and protect obturator nerve
• The lymph node bearing tissue is swept out of the obturator fossa the dissected from the bladder and sent as a separate packet rather than en bloc with the bladder

• Obturator nerve retracted lartherally before taking the lateral pedicle
Taking the Lateral Pedicle

- Ligasure
- Vascular stapler
- Clips
Rationale for Extended Pelvic and Iliac LND

- Standard LND includes external/internal iliac and obturator lymph nodes
  - Identifies ≥95% of N1; skip metastases rare
- Extended LND includes pre-sacral, CI and distal aorta/IVC nodes
  - Increases node yield by 34-40%
  - 36-43% of P3,P4N+ have node metastasis above CI bifurcation
P53 Targeted Therapy Trial
Surgical Quality

- Required bilateral PLND
  - Minimum 15 nodes per protocol
- Median nodes removed 20 (1-125)
- 48% extended node dissection
  - 96% from 2 sites median nodes 40 vs. 15 for other sites
- 33% had < 15 nodes
  - Associated with extent of LND
  - 53% standard vs. 20% extended
Transurethral resection biopsy of the prostatic and apical margin status at radical cystoprostatectomy

Final margin negative 97.5%
Transurethral resection biopsy of the prostatic and apical margin status at radical cystoprostatectomy

TUR biopsy pos 49

Frozen section Done 17
- Positive 1
- Negative 16
  - Final margin neg 1
  - Final margin neg 15
    - Pos 1 (CIS)

Frozen section Not done 32
- Urethrectomy 13
  - Final margin neg 30
  - Final margin pos 2

Final margin negative 94%

With Diffuse CIS
TUR Prostatic Urethra and Apical Urethra Margin Status

- A positive TUR biopsy, while having a high positive predictive value for prostatic TCC, has a very low positive predictive value for the apical margin status
- TUR biopsy findings may be used to counsel patients regarding likelihood of orthtopic neobladder
Prostate/SV Sparing?

- **Pros** – optimized continence and potency
- **Cons**
  - Urothelial carcinoma of the prostate 40%
  - Prostatic adenocarcinoma 40%
  - ≥50% clinically significant
What About Prostate Apical Sparing?

- Rationale: Essential role of the prostatic apex for continence and the location of the autonomic nerves in this region
- Apex-sparing approach may be a treatment option for muscle-invasive bladder cancer
  - 7/95 (7.3%) prostate cancer in the apex
Rationale for Urethral Preservation in Women

- Pelvic neuroanatomy
- Cancer involvement of the bladder neck and urethra

Do not dissect into or below the levators

Female Urethra Sparing Indications

- Motivated to be free of external appliance
- No cancer at bladder neck
- T3 posterior tumor at bladder base contraindicated
- Accepting of intermittent catheterization
- Absence of sphincteric deficiency
Lines of resection for organ preserving (simple) - (blue line), urethra-spearing - (green line) and radical cystectomy (red line).
Nerve Sparing Female

Resection Anterior Vagina
Preserve Distal Anterior Vagina
Occlusion Proximal Urethra

Urethra

Bladder neck
Division of Urethra

Urethra

Bladder neck
Vaginal Suspension

- Important to preserve vaginal length
- Prevent enterocele
Using the Omentum

• Cover the abdominal contents
  – Provides barrier to intestines in case of re-operation

• Separates the anterior vagina and neobladder suture lines
  – Minimize risk of fistula

• May provide additional support to the neobladder
Using the Omentum

• Anatomy to develop a pedicle
  - Attached to transverse colon; divide avascular plane
  - Blood supply: left and right gastroepiploic
  - Right is a branch of the gastroduodenal which originates from the common hepatic
  - Left is a branch of the splenic artery
  - Bring down right or left gutter
  - Mobilize off of greater curvature of stomach by taking down short gastrics
Secure pedicle to levator muscles with absorbable sutures
Summary

• Anatomic orderly approach to pelvic and iliac lymphadenectomy and radical cystectomy
• Clip ureters to facilitate dilation
• Circumferential mobilization of external iliac vessels
Summary

- Pre-sciatic (Fossa of Marseilles)
- Pre-sacral fossa
- Female vaginal preservation
  - Suspend the apex of the vagina
- Use of omentum