Radical Cystectomy

- Major procedure
- High morbidity – 20 – 30%
- Most pts have co morbidity (COPD, vascular disease, obesity, DM, aging)
- Diversion
- Technique
- Chemotherapy
## Radical Cystectomy
### 5 year survival

<table>
<thead>
<tr>
<th>Path Stage at RC</th>
<th>5 year survival (%)</th>
<th>Stein et al 2001*</th>
<th>Studer et al 2003+</th>
<th>Miami Series</th>
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<tbody>
<tr>
<td><strong>Number</strong></td>
<td></td>
<td>1054</td>
<td>507</td>
<td>444</td>
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<tr>
<td><strong>Organ confined</strong></td>
<td>RFS</td>
<td>85</td>
<td>73</td>
<td>79</td>
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<tr>
<td><strong>N -ve</strong></td>
<td>OSS</td>
<td>78</td>
<td>62</td>
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<tr>
<td><strong>Extravesical</strong></td>
<td>RFS</td>
<td>58</td>
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<td>OSS</td>
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<td><strong>Nodes +ve</strong></td>
<td>RFS</td>
<td>35</td>
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<tr>
<td><strong>OSS</strong></td>
<td>31</td>
<td>26</td>
<td>22</td>
<td></td>
</tr>
</tbody>
</table>

+Journal of Clinical Oncology, Vol 21, No 4, 2003, pp 690-696
Operative Technique

Open Cystectomy

- RCX has been assessed the *highest* values in terms of *difficulty of surgery* for any procedure in urology

Laparoscopic/Robotic

- RC is the *most difficult* robotic *procedure*, and more so if diversion is performed totally intracorporeally

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Montie 2005

Rassweiler Minim Invasive Ther 2005
Quality of Surgery

1. Mortality from CX at low vs high volume hospitals - 3.1% vs 0.7%

2. Negative surgical margins and ≥ 10 LN removed were associated with better overall survival independent of patient age, pathological stage, nodal status and whether or not patients actually received neoadjuvant chemo.

Elting, Cancer 2005
Herr, J Clin. Urol. 2004
3. 28% of the MRC patients had a local recurrence and all eventually died of disease. Local recurrence developed in 68% of margin positive patients compared to 6% in margin negative patients. High vs low volume urologists had a margin+ rate of 4% vs 14%.

4. The quality of CX and PLND directly impacts the chances of survival and is surgeon dependent.

Elting, Cancer 2005
Herr, J Clin. Urol. 2004
Likelihood of receiving a neobladder after radical CX varies

- **Geographic**
  - Social / ethnic / religious factors

- **Healthcare system**

- **Referral pattern**

Example USA:
- 50 % at medical centers
- 15 % Medicare population

Saigal, J Urol 2005
Radical cystectomy is a morbid procedure even in the most experienced hands, with contemporary single institution series reporting postoperative complications in the range of 25-57%. In-hospital mortality of ≤ 3%, and reoperative rates in the range of 2.3-17%.

Konety Urology 2006
How do the experts divert?

<table>
<thead>
<tr>
<th>CX #</th>
<th>Period</th>
<th>NBL</th>
<th>Cont. Cutan.</th>
<th>Conduit</th>
<th>UC / TUUC</th>
<th>anal</th>
<th>others</th>
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<tbody>
<tr>
<td>Ann Arbor</td>
<td>643 02/95-09/04</td>
<td>45,1%</td>
<td>1,4%</td>
<td>53,5%</td>
<td>0,0%</td>
<td>0,0%</td>
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<tr>
<td>Bern</td>
<td>327 01/99-09/04</td>
<td>54,0%</td>
<td>3,0%</td>
<td>37,0%</td>
<td>0,0%</td>
<td>3,0%</td>
<td>n.a.</td>
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<td>Dallas</td>
<td>228 01/99-09/04</td>
<td>30,0%</td>
<td>6,0%</td>
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<td>0,0%</td>
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<tr>
<td>Kobe</td>
<td>87 02/89-09/04</td>
<td>46,0%</td>
<td>2,3%</td>
<td>10,3%</td>
<td>41,4%</td>
<td>0,0%</td>
<td>0,0%</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>1359 08/71-12/01</td>
<td>51,6%</td>
<td>25,8%</td>
<td>22,3%</td>
<td>0,0%</td>
<td>0,0%</td>
<td>0,3%</td>
</tr>
<tr>
<td>Lund</td>
<td>119 01/00-09/04</td>
<td>28,6%</td>
<td>31,1%</td>
<td>40,3%</td>
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<td>0,0%</td>
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<tr>
<td>Mansoura</td>
<td>3157 01/80-01/04</td>
<td>39,1%</td>
<td>3,5%</td>
<td>34,4%</td>
<td>0,0%</td>
<td>23,1%</td>
<td>0,0%</td>
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<td>Tübingen</td>
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<td>Ulm</td>
<td>1209 01/86-09/04</td>
<td>66,2%</td>
<td>0,5%</td>
<td>22,6%</td>
<td>8,9%</td>
<td>1,5%</td>
<td>0,4%</td>
</tr>
<tr>
<td>Total</td>
<td>7129</td>
<td>46,9%</td>
<td>7,6%</td>
<td>32,7%</td>
<td>2,0%</td>
<td>10,6%</td>
<td>0,1%</td>
</tr>
</tbody>
</table>

Hautmann, Urology 2007
Patient Selection Criteria: Absolute Contraindications

- Compromised renal function (creatinine > 2.0 mg/dl)
- Compromised intestinal function
- Significant hepatic insufficiency
- Indications for simultaneous urethrectomy
  - TIS/TCC prostatic urethra
  - Prostatic ducts/stromal invasion
Patient Selection Criteria: Oncologic Factors

- Rhabdosphincter must remain intact
- Cancer operation must not be compromised at urethroenteric anastomosis, retained urethra or surgical margins
- Less restrictions for pt. selection
  - locally advanced cancer
  - positive lymph nodes
Patient Selection Criteria: Patient Factors AGAINST

- Main motivation: get out of hospital as soon as possible and resume normal (sedentary) activities
- No concern about body image
Patient Selection Criteria: Patient Factors PRO

- Pt’s desire for neobladder (motivation)
- Psychologically damaging stigma to the patient who enters surgery expecting a neobladder, but awakens with a stoma
Recurrence free survival; P<0.001
Disease specific survival

Cum Survival

Follow-up in months

P<0.001

LN-

LN +
Urinary Diversion Decision Making

- Continent
- Incontinent
Type of Urinary Diversion

- Urethral Margin
- Renal Function
- Radiation
- Bowel Status

- Patient Preference
- Patient Factors
  - Age
  - Co Morbidity
  - Co-ordination
  - Motivation
Urinary Diversion
BMI
Neobladder in Elderly

• > 75 yrs
  < 75 yrs

• No difference

  Operative time
  Length of stay
  Complications

• Quality Of Life

  < 75  2.5
  > 75  2.9

• Continence

  Day time
  No difference

  Night time
  87% Vs 92%

Saika T, Kumon H et al; Orthotopic neobladder reconstruction in elderly bladder cancer patients; Int J Urology;8:2004, 533-538
Robotic Assisted Radical Cystectomy
Advantages

• Small incisions
• Magnification and 3-D vision
  - Reduced bleeding
  - Potential for better nerve sparing
• Decreased post-op pain
• Short hospital stay
• Early return to activity
• Cosmesis
Concerns

- Quality of Lymph node dissection
- Positive margin rates
- Oncological efficacy
- Lack of randomized trials
- Cost
- Learning curve
**Perioperative outcomes**

<table>
<thead>
<tr>
<th></th>
<th>Robotic (n = 21)</th>
<th>Open (n = 20)</th>
<th>p value</th>
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</thead>
<tbody>
<tr>
<td>Mean EBL, ml</td>
<td>258</td>
<td>575</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>OR time, h</td>
<td>4.20</td>
<td>3.52</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Time to flatus, d</td>
<td>2.3</td>
<td>3.2</td>
<td>0.0013</td>
</tr>
<tr>
<td>Time to BM, d</td>
<td>3.2</td>
<td>4.3</td>
<td>0.0008</td>
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<tr>
<td>Length of stay, d</td>
<td>5.1</td>
<td>6.0</td>
<td>0.2387</td>
</tr>
<tr>
<td>In-house analgesia, mg</td>
<td>89.0</td>
<td>147.4</td>
<td>0.0044</td>
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<tr>
<td>Clavien units</td>
<td>2.3</td>
<td>2.6</td>
<td>0.5622</td>
</tr>
</tbody>
</table>

BM = bowel movement; EBL = estimated blood loss; OR = operating room.
Summary

• Newer technologies need to encouraged

• Current results indicate at least equivalent results following Robotic cystectomy

• Further studies are needed
University of Miami
Technique

- Standard Robotic assisted radical cystectomy and pelvic lymph node dissection

- Pfannenstiel incision
  - Extract specimen
  - Urinary Diversion
University of Miami experience

- 22 patients underwent RARC since April 2008.
- Mean age 66 yr (44-85)
- All had extracorporeal urinary diversions
- EBL was 310±220 ml
- Mean operating time 6±0.8 hr
University of Miami experience

- No intraoperative visceral injuries
- No positive surgical margins
- Mean number of lymph nodes removed was $12 \pm 3$
- Mean hospital stay was 8.5 days
UM experience

- Postoperative Picture following RARC
Robotic Assisted Radical Cystectomy

- Increasing Popularity
- Patient Selection
- Patient outcome
- Oncological Outcome
Robotic Assisted Radical Cystectomy

ADVANTAGES

- Blood Loss
- Hospital Stay
- Oncological Outcome
- Morbidity
- Return to Normal Activity
Robotic Assisted Radical Cystectomy

DISADVANTAGES

- Learning Curve
- Assistant Dependent
- Tactile Feedback
- No randomized Studies
- Cost
Radical Cystectomy
Follow up Monitoring

- Detect Recurrence
- Detect New Upper tract tumors

To identify renal compromise
Radical Cystectomy
Follow up Monitoring

<table>
<thead>
<tr>
<th></th>
<th>3</th>
<th>6</th>
<th>12</th>
<th>18</th>
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</tbody>
</table>

* Radiographic studies of the upper tract consist of excretory urogram, loopogram or ultrasound.

Radical cystectomy for BCG failure: has the timing improved?

Dept. Urology
University of Miami Miller School of Medicine
Introduction

- Intravesical BCG for high-grade Ta, T1 and CIS bladder cancer.

- BCG is not uniformly effective.

- More than 30% of them progress requiring radical cystectomy.
Introduction

- Survival following RC is directly related to the pathologic stage.

- If cystectomy is performed before progression to muscle invasion (<pT2), as is the case when BCG is first initiated, the cancer specific survival is over 90%.
Objective

- Analyze if there is a trend in recent years towards performing RC before muscle invasion or extravesical BC.
Methods

- Retrospective analysis of our RC database (1992-2008)
- Analyze patients who underwent RC after BCG
Methods

- RC from 2003 -2007 (group 1)
- RC from 1992-2002 (group 2)
- Pathologic stage and survival compared.
Results


- 168 (38%) had BCG prior to RC.

- 152 met the inclusion criteria. (75 group 1 & 77 group 2).
Results

• Both groups were similar in
  □ Baseline demographics
  □ T-stage prior to BCG initiation
  □ BCG cycles received
  □ Time interval from initiation to RC.
Results

- No change in the proportion of patients undergoing RC with <T2 BC

- 52% in group 1 and 43% in group 2 had progressed to muscle invasive BC (p=0.5)
# Results

Comparison of pathologic stage at RC and survival.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Group 1(%)</th>
<th>Group 2(%)</th>
<th>P</th>
</tr>
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<tbody>
<tr>
<td>&lt;T2</td>
<td>36(48)</td>
<td>44(57)</td>
<td>0.5</td>
</tr>
<tr>
<td>T2</td>
<td>15(20)</td>
<td>13(17)</td>
<td></td>
</tr>
<tr>
<td>&gt;T2</td>
<td>24(32)</td>
<td>20(26)</td>
<td></td>
</tr>
<tr>
<td>N+</td>
<td>12(16%)</td>
<td>8(11%)</td>
<td>0.1</td>
</tr>
<tr>
<td>5-yr Overall Survival</td>
<td>68±8</td>
<td>60±6</td>
<td>0.2 (Log rank)</td>
</tr>
<tr>
<td>(Events)</td>
<td>15</td>
<td>36</td>
<td></td>
</tr>
</tbody>
</table>
Results

Disease specific survival by group (log rank p=0.2)
Conclusions

- Over the past 15 years, we did not find a trend towards early surgery at a lower pathologic stage in patients undergoing RC after BCG.
Radical Cystectomy
Follow up Monitoring

Imaging

- Stage Based
- Frequency
- Controversial
- CT scan
- Ultrasound / MRI
Radical Cystectomy
Follow up Monitoring

- **Urine Cytology**
  6 monthly

- **Blood work up**
  3 – 6 monthly

- **Lower Tract**
  Cystourethroscopy
  Urethral Wash Cytology
  Annual
HYDRONEPHROSIS FOLLOWING URINARY DIVERSION

Malignancy

Reflux

Benign Stricture
  Radiation, Ischemia

Incomplete emptying of the reservoir

Other causes
  Stones
Neoadjuvant
N = 47

Surgeon – 1, Patient – 6
Neoadjuvant Therapy

- MVAC: 28%
- Gem+Cis: 51%
- Others: 22%
Adjuvant

N = 80

<table>
<thead>
<tr>
<th></th>
<th>Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>80</td>
</tr>
<tr>
<td>Initiated</td>
<td>48</td>
</tr>
<tr>
<td>Completed</td>
<td>40</td>
</tr>
</tbody>
</table>
Reasons for not initiating ACT
N = 32 (40%)

- Co-morbidities: 22 patients
- Surgical complication: 9 patients
- Death: 1 patient
Upper tract recurrence

- Range 2-8%
  - Tsuji Y J urol 1996
    - 8.2%
  - Perez J J urol 2001
    - 4.5%
  - Sanderson et al J Urol 2007
    - 2.5%

- Mean interval of UTR
  - Kenworthy P, J Urol 1996
    - 40 months
  - Balaji K.C, J.Urol 1999
    - 37 months
  - Sved P, BJU Int 2004
    - 40 months

- Risk factors
  - Kenworthy P, J Urol 1996
    - Distal ureter UC
  - Sanderson et al J Urol 2007
    - Prostatic CIS, urethral UC
  - Sved P, BJU Int 2004
    - Urethral UC
Hydronephrosis
Post Radical Cystectomy

Clinical and Pathological features

Imaging
US / CT scan/ Loopogram

Urine Cytology
Renal Function

MAG 3 Renogram

Nephrostomy
Nephrostogram

Antegrade Ureteroscopy
Biopsy

Surgical Intervention
Advanced bladder cancer

Chemotherapy

Adjuvant

Neoadjuvant
Results

- **Neoadjuvant Therapy**
  - 47 pts

- **Adjuvant Therapy**
  - 80 pts
Not Enough Benefit?

- RCTs demonstrate only 5 – 10% advantage
- In other cancers this is sufficient to recommend adding therapy as a standard, e.g. breast, colon cancer
Reserve for cT3 or N+

- Accuracy of clinical staging is relatively poor
- Urologists notorious for understaging
Save the T2 Pts. ChemoRx?

• If chemotherapy is necessary for a patient to be cured are they more likely to receive chemotherapy before or after surgery

• Neoadjuvant >>> Adjuvant
Debate - Bellmunt

- RC – 50% die despite surgery
- Metastatic UC: 10 – 20% long term survival with cisplatin based chemotherapy
- In breast and colon cancers early chemotherapy has improved survival 5 – 30%
**Bellmunt**

- Neoadjuvant chemotherapy improved OS 5%
- Neoadjuvant > adjuvant
- Tolerated better, assess response, immediate Rx of metastases
- Possible role of bladder preservation if cT0
Bellmunt

- Potential to study tissue before and after chemotherapy
- Often delay to OR anyway
Neoadjuvant Chemotherapy

- Two RCTs demonstrate small survival benefit for cT2 – T3 TCC
- Overwhelming majority of urologists proceed straight to RC for cT2
- Most even if cT3 unless bulky cancer or “inoperable”
- Why??
Chemotherapy

- Carboplatin not shown to be equivalent to cisplatin; reserved only if creatinine clearance compromised
- Ongoing evaluation of triplets
Discussion Points

• Which pts best for bladder preservation with chemotherapy + EBRT?
• Who receives neoadjuvant chemotherapy?
• Who is good candidate for neobladder?