Optimizing Rectal Resection: New Concepts

The UCSF Postgraduate Course in General Surgery
April 29-May 1, 2010

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Contemporary paradigm for rectal cancer management

- Accurate staging (MRI, ERUS)
  - Selective use of Local Excision
  - Use of pre-op CRT for advanced lesions
- Treatment planning at a Multi-disciplinary Cancer Conference
- Precision surgery
  - Sharp anatomic dissection
    - Intact mesorectum
  - Preservation of pelvic nerves
  - Preservation of the anus
  - Selective use of colon pouch
- Assessment of the quality of the excision and patient outcomes
  - Pathological audit and feedback
  - Oncologic & Functional outcomes

Precision surgery: operative quality is the most important aspect of management

- Local recurrence = local residual = our failure...
  - To achieve clear margins
  - To preserve an intact mesorectum
    - The integrity of the mesorectum has evolved into a marker of operative quality

Sharp Anatomic Dissection
TME, EFE, TAD, SME, TsME, ...

Intact Mesorectum

MRI + CRM + Neoadj RX
- Dutch: TME v TME/irrt
  - 5 yr LR 11.4% v 5.8%
- German: TME/post v TME/pre
  - 5 yr LR 13% v 6%

Negative Circumferential Margin

↓ Local Recurrence & ↑ Survival

↓ 30% to 5-15%

↑ 3-30% to ~5%
Intact mesorectum

- 130 pts (2001-2003) curative TME resections
- Mesorectum graded:
  1. little bulk, defects down to muscularis propria
  2. moderate bulk, irregular surface, no visible muscle
  3. intact, smooth, no defect >5mm

<table>
<thead>
<tr>
<th>Mesorectal grade vs Recurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>MR grade</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>p</td>
</tr>
</tbody>
</table>

47% grade 3!


Problem #1: this is not (always) easy

- Mesorectal anatomic variation
  - Shape, size
  - Minimal anterior component
- Rectosacral fascia: variable
- Denonvilliers’ “fascia"

Thickness of fascia propria


Rectal cancer: the APR problem

Local recurrence

Overall survival

Ca-specific survival

* Pooled data from 4 European trials
* APR also associated with CRM positivity


Inadequate resection in APR

Grade of mesorectum vs distance of cancer from verge (130 patients)

<table>
<thead>
<tr>
<th>MR grade</th>
<th>&lt;5 cm</th>
<th>5-10cm</th>
<th>&gt;10cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (poor)</td>
<td>12</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>2 (fair)</td>
<td>12</td>
<td>13</td>
<td>27</td>
</tr>
<tr>
<td>3 (good)</td>
<td>5</td>
<td>13</td>
<td>43</td>
</tr>
</tbody>
</table>

APR specimens: 29% grade 1
AR specimens: 10% grade 1 (p<0.01)

Evidence of inadequate tumor excision: APR v LAR

<table>
<thead>
<tr>
<th>Variable</th>
<th>APR</th>
<th>AR</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRM+ (%) 1986-97</td>
<td>36</td>
<td>22</td>
<td>.002</td>
</tr>
<tr>
<td>CRM+ (%) 1997-00</td>
<td>41</td>
<td>12</td>
<td>.006</td>
</tr>
<tr>
<td>CRM+ (%) Dutch</td>
<td>30</td>
<td>10</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>CRM+ (%) Norway</td>
<td>12</td>
<td>5</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Incomplete MR (%)</td>
<td>66</td>
<td>27</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Perforation (%)</td>
<td>14</td>
<td>2.5</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Perforation (%) Norway</td>
<td>15</td>
<td>4</td>
<td>&lt;0.05</td>
</tr>
</tbody>
</table>


What about biologic factors?

Risk of lymph node metastasis in T1 carcinoma of the rectum (i.e. in resection specimens)

<table>
<thead>
<tr>
<th>Site</th>
<th>No.</th>
<th>LN M No. (%)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower 1/3</td>
<td>29</td>
<td>10 (34)</td>
<td>0.007</td>
</tr>
<tr>
<td>Middle 1/3</td>
<td>54</td>
<td>6 (11)</td>
<td></td>
</tr>
<tr>
<td>Upper 1/3</td>
<td>36</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

LN M = lymph node metastasis


Other variables reaching statistical significance:
- SM3
- LV
- Poor differentiation

What goes wrong when the problem is a few centimeters lower?
**APR: ‘WAIST’ VS ‘CYLINDER’**


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**“CYLINDRICAL” APR**

1. Plan this in advance (checklist!

2. Stop the pelvic dissection at the “top of the levators” and ... 
   flip the patient (prone): facilitates the anterior dissection

3. Maintain a cylindrical package around the Tumor → increased specimen bulk

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**EVIDENCE OF SUPERIORITY OF “CYLINDRICAL” APR**

CRM+ & Perforation rates

Mean distance from cancer

- Standard
- Cylindrical


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**Does cylindrical APR increase the risk of perineal hernia?**

- **Probably**
- **Proposed solutions**
  - Flap reconstruction (rectus abdominis, gluteus or gracilis)
    - Morbidity
    - More complex (I need help)
  - Bioprosthetic mesh reconstruction*
    - Permacol: interrupted sutures to “rim of leftover pelvic floor” (I can do it myself!)
  - Perineal and pelvic drains
  - Cx: seroma and pain

- 10/11 well without pain (F/U 3–18 mo)

The “unavoidable” non-healing perineal wound: role for a prophylactic flap?

**YES; think about it...**

- **Patient factors**
  - ↑BMI, IDDM, Anemia, ?Smoker
  - Disease factors: huge defect or unfriendly tissues, e.g.:
    - “Salvage” for anal cancer
    - Extensive Crohn’s with fibrotic tissue
    - Large cancer (especially multi-visceral resection)
- **Consult with Plastics**
  - VRAM
  - Gracilis

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Other technical issues...

- **Patient positioning**
  - **Prone jack-knife advantages**
    - Better visualization during critical dissection.
    - Faster.
    - Less bleeding.
    - Reconstruction much easier.
  - **Prone jack-knife disadvantages**
    - Need OR staff cooperation.
    - Can be difficult to deliver exceedingly bulky specimens.
    - Need to be sure you have dissected as low as possible prior to closing!

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Other technical issues...

- **Open vs laparoscopy: oncologic outcomes and evidence**
  - Unlike colon cancer, prospective evidence of non-inferiority for lap approach in rectal cancer is more limited.
    - **MRC CLASICC trial (3 year data).**
      - Only trial to evaluate laparoscopy for rectal cancer prospectively.
      - 5 year data yet to be released.

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MRC CLASICC Trial

- **Subset analysis of rectal cancer (mid/low)**
  - Overall + CRM 14% vs 16% open vs lap (p=.80)
  - No difference noted in +CRM among APR (20 vs 26% open vs lap).
  - Differences did not translate into ↑LR rates.
  - 34% conversion rate.
MRC CLASICC Trial

- No difference in 3 year outcomes
  - Overall survival:
    - LAR Lap 74.6% vs. LAR Open 66.7% (p=.17)
    - APR Lap 65.2% vs 57.7% Open (p=.41)
  - Disease specific survival:
    - LAR Lap 70.9% vs 66.8% Open (p=.87)
    - APR Lap 49.8% vs 46.9% Open (p=.64)
  - LR rate:
    - Overall: 7.8% Lap vs 7.0% Open (p=.70)
    - APR specific: 15.1% Lap vs 21.1% Open (p=.54)

Current/Future Studies in Laparoscopic Rectal Cancer

- UK MRC CLASICC trial: awaiting 5 year data
- Japanese Clinical Oncology Group (JCOG) 0404: awaiting data (activated in 10/04)
- COLOR II: Accruing...
- ACOSOG Z6051: Accruing...

Summary

- Operative quality (“precision surgery”) is the most important aspect of management
  - A complete mesorectum $\Rightarrow$ rates of pos CRM & $\downarrow$ local recurrence rates
- APR challenges precision surgery
  - $\uparrow$rates of incomplete mesorectum
  - $\uparrow$rates of pos CRM
  - $\uparrow$rates of specimen perforation
  - $\uparrow$rates of local recurrence (& $\downarrow$survival)
- Our approach to APR must improve
  - “Cylinderectomy” technique?
- Cancer outcomes for minimally invasive techniques must be non-inferior in prospective trials