Operative Technique: Total Mesorectal Excision

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SCOAP Retreat – June 17, 2011
No Disclosures
Purpose

• What is Total Mesorectal Excision (TME)?
• How is it different than non-TME techniques?
• Operative principles
What is TME?
Why should surgeons perform TME?

- Old surgical methods for rectal cancer leave tumor cells in the pelvis.
- Tumor left in the mesorectum leads to local recurrence.
- TME removes the intact mesorectum and does not leave tumor cells behind.
The Problem: Local Recurrence of Rectal Cancer

• 85% cases occur within 3 years of surgery
• Local recurrence colon cancer = 7-10%
• Local recurrence rectal cancer = 25-50%
  – 50% have disease limited to pelvis and no mets
  – 70% die of disease within 3 years
  – Severe pain with tumor invasion into the bony pelvis or local organs, tenesmus, bleeding, fungating foul-smelling masses, obstruction

Quality of Life: Bladder & Sexual Function

- Dyspareunia, failure to achieve orgasm, loss of vaginal lubrication, erectile dysfunction, retrograde ejaculation, impotence
- Difficulty in bladder emptying, urgency, incontinence, loss of sensation of fullness, recurrent urinary tract infections, neurogenic bladder
  - TME: 0-10%
  - Historical series: 10-50%

*Enker, Arch Surg 1992;127*
*Enker et al, JACS 1996;182:495*
The Origin of TME - 1978

- 1978: Mr. Richard J. Heald, MChir, FRCS Basingstoke, England
- **Hypothesis**: local recurrence is a result of the surgeon leaving mesorectal residue in the pelvis
- Questioned traditional operative technique
- Developed the precise surgical dissection of the mesorectum known as TME
How is TME Different Than Non-TME Techniques?
‘Old’ Proctectomy Techniques

- Partial direct vision (in upper pelvis only)
- Coned down excision of the ‘mesorectum’ to 2cm beyond tumor
- Blunt dissection with violation of mesorectum
DETAILS OF PROCEDURE (Continued). After the peritoneal reflection on the right side has been divided adjacent to the superior hemorrhoidal vessels, the rectosigmoid and its blood supply can be completely encircled by the surgeon’s left hand (Figure 6). The peritoneum is divided down to the level of the cul-de-sac on the right side, and the ureter, which may be attached to the reflected peritoneum on the right side, is freed by blunt gauze dissection throughout its course in the pelvis. The surgeon may pass a piece of gauze around the bowel and its blood supply to serve as a retractor instead of using his left hand (Figure 7). Some prefer to ligate the bowel with a tape proximal to the lesion.

The surgeon passes his right hand down into the hollow of the sacrum to free the rectum by blunt finger dissection (Figure 8). The hand should be kept as close to the bone as possible so that whatever loose areolar tissue is present will be removed with the bowel to be excised. The rectum usually can be freed by blunt finger dissection as low as the sacrococcygeal junction (Figure 9). In the presence of large tumors that at first may appear to be immovable because of lateral fixation, it is important that the surgeon determine by this procedure that the tumor can be mobilized before proceeding to ligate the blood supply of this portion of the intestine.

After it has been determined that the rectum can be mobilized, it is necessary to divide three remaining points of fixation, i.e., the peritoneum in Douglas’ pouch anterior to the rectum and the lateral suspensory ligaments containing the middle hemorrhoidal vessels. The peritoneum in Douglas’ pouch anterior to the rectum is mobilized by blunt finger dissection and divided with long, curved scissors (Figure 10). The anterior wall of the rectum is further freed from the adjacent structures by blunt dissection. This is facilitated if the bladder in the male or the uterus in the female is retracted upward and forward by a large S-shaped retractor. In the male blunt dissection is carried down behind the prostate.
TME Principles

- *Total excision* of the ‘mesorectum’
- *Direct* vision
- *Sharp* dissection
- *Avascular* plane
- Ensuring an *Intact fascial envelope* containing the tumour (which avoids tumor spill)
- *Nerve preservation* for bladder and sexual fxn
- *Sphincter preservation* when possible
## OPTIMIZING PROCTECTOMY TECHNIQUE(S)

<table>
<thead>
<tr>
<th></th>
<th>“Conventional”</th>
<th>“Optimal”</th>
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<tbody>
<tr>
<td>Dissection</td>
<td>Blunt, Indirect</td>
<td>Sharp, Direct</td>
</tr>
<tr>
<td>Mesorectum</td>
<td>Violated</td>
<td>Resected intact (TME)</td>
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<tr>
<td>Distal Margin</td>
<td>“Cone-In”</td>
<td>&gt; 5 cm Mesorectum;</td>
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<tr>
<td></td>
<td></td>
<td>&gt; 2 cm Mural</td>
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<tr>
<td>Lateral Margin</td>
<td>Variable</td>
<td>Endopelvic Fascial Plane</td>
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<tr>
<td>Autonomic Nerves</td>
<td>Variable</td>
<td>Preserved</td>
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</tbody>
</table>

*CRSAL U of M*
**Intersurgeon Variations:**
*Minimizing These in WA State via SCOAP*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Range (%)</th>
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<tbody>
<tr>
<td>Morbidity and mortality</td>
<td>10-40</td>
</tr>
<tr>
<td>3 year local recurrence</td>
<td>0-41</td>
</tr>
<tr>
<td>5 year death from rectal CA</td>
<td>16-57</td>
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<td>APR rates (loss of sphincter)</td>
<td>39-83</td>
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*Holm et al, BJS, 1997*
Required Instruments

- Headlight
- St. Mark’s retractor (lighted)
- Staplers
  - GIA, TA and EEA
Patient Position

tape pillow support
Sharp Mesorectal Excision for Rectal Cancer

Elements of Technique

1. Mobilize sigmoid and left colon
2. Identify ureters and sympathetic nerves
3. Mobilize splenic flexure
4. Divide colon and vascular pedicle
5. Separate sympathetic nerves
6. Aggressive anterior traction on mesorectum
7. Penetrate Waldeyer’s to the bony pelvis
Left Pelvic Exposure

sympathetic n.
L. ureter.
iliac vessels.
bladder
rectum
superior hemorrhoidal a.
Right Pelvic Exposure
Splenic Flexure Mobilization
Bowel Division
IMA Clearance and Ligation of Vasculature
Sharp Mesorectal Excision for Rectal Cancer

Elements of Pelvic Dissection

• Posterior dissection first
• Scissor spreading and cautery, after penetrating Waldeyer’s fascia
  • Along bony pelvis (parietal fascia)
  • Through recto-sacral fascia
  • Up levators to level of anus
• Anterior dissection second
Posterior Dissection Between Sympathetic Nerves at True Pelvis Entrance

Waldeyer’s fascia penetrated to bony pelvis (parietal fascia)
Posterior Dissection Through Rectosacral Fascia
Anterior Clearance in Women
Identification of Denonvillier’s Fascia in Men
Sharp Mesorectal Excision for Rectal Cancer

Lateral Clearance

- Clearance to levator fascia posterior and anterior allows delineation of “lateral stalks”
  - Main sidewall nerve trunk is S3
  - Most common site for damage is **anterolateral**
- Tumor location may not allow **symmetrical** clearance
- Laparoscopic vascular stapler, low energy cautery, bipolar cautery, clips all valuable - avoid large clamp and suture ligation
Division of Right “Stalks” with Laparoscopic Vascular Stapler
ColoAnal Reconstruction After TME

- Double-stapled end-to-end
- Colonic J-Pouch
- Coloplasty Rectal Pouch
Completion of TME Procedure

• Air insufflation per anus; saline in pelvis & hand clamp above
• Digital rectal examination
• +/- Proctoscopy
• +/- Drain
• Diversion
  • Ileostomy
• Specimen assessment
Conclusions

• TME for rectal cancer:
  – dramatically reduced local recurrence rates
  – increased survival
  – decreased incidence of bladder & sexual dysfunction
  – sphincter preservation
Thank You!