Surgery for Colorectal Cancer: Healing with Steel

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Objectives

1. Describe the role of surgery in the multimodality treatment of colorectal cancers
2. Distinguish between the major operative procedures for colorectal cancers
3. List common complications following colorectal cancer surgery
4. Describe long term functional outcomes after colorectal cancer surgery
Presenter Disclosure

- **Faculty**: Jason Park

- **Relationships with commercial interests:**
  - Grants/Research Support: Ethicon Endo-surgery
Mitigating Potential Bias

• Not applicable
Modern treatment of colorectal cancer: Multimodality approach

Colon Cancers

- Diagnosis and Staging
- Surgical resection
- +/- Chemotherapy

Rectal Cancers

- Diagnosis and Staging
- +/- Radiation
- Surgical resection
- +/- Chemotherapy
Modern management of colorectal cancer

• Surgery provides *definitive management* of primary tumours and offers *best chance of cure* in *appropriately selected patients*

• Adjuvant treatments (radiation and chemo) can *decrease local recurrence* and *improve survival*
Five-year survival by American Joint Committee on Cancer system stages I–IV.

Surgery for colorectal cancers

• **Resection**  
  Resection of cancer, with negative margins, and lymphatics

• **Excision**  
  Full thickness excision of *rectal* lesion with negative margins
  
  – Transanal excision (TAE)
  
  – Transanal endoscopic microsurgery (TME)
Right hemicolecotomy

Left hemicolecotomy
Laparoscopic colon resections

**Advantages**
- Slightly shorter hospitalization
- Slightly faster return to function
- Improved cosmesis

**Disadvantages**
- Longer operative time
- Not everyone is a candidate

*No difference in oncologic outcomes*
Surgical resection for rectal cancers
Total Mesorectal Excision (TME)

- Dissection in areolar plane between visceral & parietal fascia
- *en bloc* removal of rectum & mesorectum as intact “package”
Autonomic Nerve Preservation

- Damage to sympathetic hypogastric nerves
  - Increased bladder tone and reduced bladder capacity
  - Impaired ejaculation in men

- Damage to parasymp system
  - Increased tone in bladder neck
  - Erectile dysfunction in men
  - Impaired vaginal lubrication in women
What’s the difference between an LAR and an APR?
Low anterior resection (LAR) with diverting loop ileostomy

Abdominoperineal Resection (APR) with end colostomy
Low anterior resection (LAR) with diverting loop ileostomy
Abdominoperineal Resection (APR) with end colostomy
Cancer
Marking stitch
Anterior peritoneal reflection
Common ileostomy-related complications

• High outputs, dehydration, electrolyte problems
• Skin irritation
• Appliance fit and adherence problems
• Para-stomal hernias
# Surgery-associated risks

## Peri-operative/Short-term
- Bleeding
- Infection
- Anastomotic leak
- Cardiopulmonary risks
  - DVT/PE
  - Cardiac events
  - Pneumonia
  - Stroke
- Death 1-2%

## Long-term
- Hernias
- Bowel obstruction
- Altered bowel function
- Sexual dysfunction*
- Urinary dysfunction*

* Applies to pelvic surgery
**Low anterior resection syndrome (LARS) score**

Add the scores from each 5 answers to one final score.

<table>
<thead>
<tr>
<th>Question</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you ever have occasions when you cannot control your flatus (wind)?</td>
<td></td>
</tr>
<tr>
<td>- No, never</td>
<td>0</td>
</tr>
<tr>
<td>- Yes, less than once per week</td>
<td>4</td>
</tr>
<tr>
<td>- Yes, at least once per week</td>
<td>7</td>
</tr>
<tr>
<td>Do you ever have any accidental leakage of liquid stool?</td>
<td></td>
</tr>
<tr>
<td>- No, never</td>
<td>0</td>
</tr>
<tr>
<td>- Yes, less than once per week</td>
<td>3</td>
</tr>
<tr>
<td>- Yes, at least once per week</td>
<td>3</td>
</tr>
<tr>
<td>How often do you open your bowels?</td>
<td></td>
</tr>
<tr>
<td>- More than 7 times per day (24 hours)</td>
<td>4</td>
</tr>
<tr>
<td>- 4-7 times per day (24 hours)</td>
<td>2</td>
</tr>
<tr>
<td>- 1-3 times per day (24 hours)</td>
<td>0</td>
</tr>
<tr>
<td>- Less than once per day (24 hours)</td>
<td>5</td>
</tr>
<tr>
<td>Do you ever have to open your bowels again within one hour of the last bowel opening?</td>
<td></td>
</tr>
<tr>
<td>- No, never</td>
<td>0</td>
</tr>
<tr>
<td>- Yes, less than once per week</td>
<td>9</td>
</tr>
<tr>
<td>- Yes, at least once per week</td>
<td>11</td>
</tr>
<tr>
<td>Do you ever have such a strong urge to open your bowels that you have to rush to the toilet?</td>
<td></td>
</tr>
<tr>
<td>- No, never</td>
<td>0</td>
</tr>
<tr>
<td>- Yes, less than once per week</td>
<td>11</td>
</tr>
<tr>
<td>- Yes, at least once per week</td>
<td>16</td>
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</tbody>
</table>

**Interpretation**

0-20      No LARS  
21-29     Minor LARS  
30-42     Major LARS
<table>
<thead>
<tr>
<th>Variable</th>
<th>No LARS n (%)</th>
<th>Minor LARS n (%)</th>
<th>Major LARS n (%)</th>
<th>Crude OR for major LARS (95% CI)</th>
<th>Adjusted OR for major LARS (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>199 (37)</td>
<td>129 (24)</td>
<td>208 (39)</td>
<td>1 (reference)</td>
<td>1 (reference)</td>
</tr>
<tr>
<td>Female</td>
<td>135 (34)</td>
<td>92 (23)</td>
<td>175 (44)</td>
<td>1.22 (0.93–1.58)</td>
<td>1.35 (1.02–1.79)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 64 years</td>
<td>139 (28)</td>
<td>119 (24)</td>
<td>239 (48)</td>
<td>1.91 (1.46–2.49)</td>
<td>1.90 (1.43–2.51)</td>
</tr>
<tr>
<td>&gt; 64 years</td>
<td>195 (44)</td>
<td>102 (23)</td>
<td>144 (33)</td>
<td>1 (reference)</td>
<td>1 (reference)</td>
</tr>
<tr>
<td>Neoadjuvant therapy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NT−</td>
<td>302 (40)</td>
<td>185 (25)</td>
<td>260 (35)</td>
<td>1 (reference)</td>
<td>1 (reference)</td>
</tr>
<tr>
<td>NT+</td>
<td>32 (17)</td>
<td>36 (19)</td>
<td>123 (64)</td>
<td>3.39 (2.43–4.72)</td>
<td>2.48 (1.73–3.55)</td>
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<tr>
<td>Operative method</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PME</td>
<td>174 (45)</td>
<td>108 (28)</td>
<td>101 (26)</td>
<td>1 (reference)</td>
<td>1 (reference)</td>
</tr>
<tr>
<td>TME</td>
<td>160 (29)</td>
<td>113 (20)</td>
<td>282 (51)</td>
<td>2.88 (2.18–3.82)</td>
<td>2.31 (1.69–3.16)</td>
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<tr>
<td>Anastomotic leakage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>327 (36)</td>
<td>217 (24)</td>
<td>365 (40)</td>
<td>1 (reference)</td>
<td>1 (reference)</td>
</tr>
<tr>
<td>Yes</td>
<td>7 (24)</td>
<td>4 (14)</td>
<td>18 (62)</td>
<td>2.44 (1.14–5.22)</td>
<td>2.06 (0.93–4.55)</td>
</tr>
<tr>
<td>Neorectal reconstruction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Straight or side-to-end anastomosis</td>
<td>296 (36)</td>
<td>200 (25)</td>
<td>316 (39)</td>
<td>1 (reference)</td>
<td>1 (reference)</td>
</tr>
<tr>
<td>Colonic pouch</td>
<td>38 (30)</td>
<td>21 (17)</td>
<td>67 (53)</td>
<td>1.78 (1.22–2.60)</td>
<td>0.96 (0.63–1.46)</td>
</tr>
<tr>
<td>Time since surgery</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25–54 months</td>
<td>151 (32)</td>
<td>117 (25)</td>
<td>202 (43)</td>
<td>1 (reference)</td>
<td>1 (reference)</td>
</tr>
<tr>
<td>&gt; 54–97 months</td>
<td>183 (39)</td>
<td>104 (22)</td>
<td>181 (39)</td>
<td>0.84 (0.64–1.09)</td>
<td>0.78 (0.59–1.04)</td>
</tr>
<tr>
<td>Subset of NT+ patients undergoing TME*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short-course radiotherapy</td>
<td>15 (16)</td>
<td>16 (17)</td>
<td>62 (67)</td>
<td>1 (reference)</td>
<td>1 (reference)</td>
</tr>
<tr>
<td>Long-course (chemo)radiotherapy</td>
<td>14 (17)</td>
<td>14 (17)</td>
<td>53 (65)</td>
<td>0.95 (0.50–1.78)</td>
<td>0.90 (0.44–1.87)</td>
</tr>
</tbody>
</table>

NT+, neoadjuvant therapy administered; NT−, neoadjuvant therapy not administered; PME, partial mesorectal excision; TME, total mesorectal excision.

*Includes 174 NT+ patients, of whom 93 received short-course radiotherapy and 81 received long-course (chemo)radiotherapy.

Bowel Function following SPS for Rectal Cancer

3.5 Med no. BM per day (range 0-30)
37% Dissatisfaction with bowel function

Comparison of Pre-op Bowel Function and Expectations of Postop Bowel Function

• 64 rectal cancer patients about to undergo SPS:
  – MSKCC Bowel Function Instrument (BFI) at baseline
  – Modified version of MSKCC BFI (BFI-Expectations) that explored expectations of postop function

• Mean MSKBFI and MSKBFI-Expectations scores not different (P = 0.42)
Conceptual model:
Proposed interactions of major themes in the expectation formation process

Rectal cancer treatment

Information sources
- Personal experiences
- Healthcare professionals
- Paper-based resources
- Online resources
- Experiences of others

Personal attitude
- Optimism

Cognitive processing

Expected outcome
- Certainty
- Importance
- Imminence

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