Pathological evaluation in Rectal Cancer

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Pathological Evaluation in Rectal Cancer
Then and Now

• In my training (1978-1984), we debated “adequate margins” as the cm’s of mucosa at the distal margin.

• Now, we debate the adequacy of Total Mesenteric Excision (TME) and the adequacy of Circumferential Resection Margin (CMR).
Rationale for Mesorectal Excision (1)

• Clinical-pathological studies correlate pelvic recurrence (and overall survival) with positive peripheral (lateral, tangential) margins
• Most rectal cancers with transmural/nodal spread have tumor confined to the “mesorectum”
• Nodal spread within the mesorectum may be distal to the rectal tumor site
• There is an areolar plane peripheral to the visceral mesorectal fascia
### Sharp Mesorectal Excision for Rectal Cancer

**Distal Mesentery:**

**At Risk for Nodal Spread?**

<table>
<thead>
<tr>
<th>Location</th>
<th>Risk (%)</th>
<th>Tumor Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leeds</td>
<td>25%</td>
<td>1-3 cm</td>
</tr>
<tr>
<td>Dublin</td>
<td>52%</td>
<td>1-5 cm</td>
</tr>
</tbody>
</table>

## Distal Mesentery: At Risk for Lymphatic Spread?

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>tum loc</th>
<th>mes spr+</th>
<th>distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leeds 1995</td>
<td>20</td>
<td>3-15cm</td>
<td>5/20=25%</td>
<td>1-3cm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(II,III)</td>
<td>rf: CRM+</td>
<td></td>
</tr>
<tr>
<td>Dublin 1996</td>
<td>44</td>
<td>n.s.</td>
<td>23/44(52%)</td>
<td>1-5cm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T3</td>
<td>rf: LVI</td>
<td></td>
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Assessment of Mesorectal Excision

- Difficult to evaluate by viewing the pelvis after the specimen removed
- By viewing the resected specimen with reflected operating light
  - Shiny visceral fascia is seen
  - Bilobed posterior mesorectum
LAR Specimen Assessment

Shiny Visceral

Mesorectal Fascia
Sharp Mesorectal Excision for Rectal Cancer

Assessment of Mesorectal Excision

- Difficult to evaluate by viewing the pelvis after the specimen removed
- By viewing the resected specimen with reflected operating light
  - Shiny visceral fascia is seen
  - Bilobed posterior mesorectum
- Pathologist should ink the circumferential margins, and “breadloaf” the specimen
  - Distal margin
  - Transmural penetration
  - Lateral margin, tumor and nodes
  - 2mm margin required
LAR Specimen Assessment
A good pathologist can predict cure by “looking” at the specimen!

Shiny Visceral
Mesorectal Fascia
Effect of Complete Mesorectal Excision on Local Recurrence Rate: Subjective Analysis by the Pathologist

<table>
<thead>
<tr>
<th>Mesorectum Intact</th>
<th>% Local Recurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incomplete</td>
<td>36%</td>
</tr>
<tr>
<td>Complete</td>
<td>20%</td>
</tr>
</tbody>
</table>
Macroscopic Evaluation of Rectal Cancer Resection Specimen: Clinical Significance of the Pathologist in Quality Control

By Iris D. Nagtegaal, Cornelis J.H. van de Velde, Erik van der Worp, Ellen Kapiteijn, Phil Quirke, and J. Han J.M. van Krieken and the Pathology Review Committee for the Cooperative Clinical Investigators of the Dutch Colorectal Cancer Group

**Purpose:** Quality assessment and assurance are important issues in modern health care. For the evaluation of surgical procedures, there are indirect parameters such as complication, recurrence, and survival rates. These parameters are of limited value for the individual surgeon, and there is an obvious need for direct parameters. We have evaluated criteria by which pathologists can judge the quality or completeness of the resection specimen in a randomized trial for rectal cancer.

**Patients and Methods:** The pathology reports of all patients entered onto a Dutch multicenter randomized trial were reviewed. All participating pathologists had been instructed by workshops and videos in order to obtain standardized pathology work-up. A three-tiered classification was applied to assess completeness of the total mesorectal excision (TME). Prognostic value of this classification was tested using log-rank analysis of Kaplan-Meier survival curves using the data of all patients who did not receive any adjuvant treatment.

**Results:** Included were 180 patients. In 24% (n = 43), the mesorectum was incomplete. Patients in this group had an increased risk for local and distant recurrence, 36.1% v 20.3% recurrence in the group with a complete mesorectum (P = .02). Follow-up is too short to observe an effect on survival rates.

**Conclusion:** A patient’s prognosis is predicted by applying a classification of macroscopic completeness on a rectal resection specimen. We conclude that pathologists are able to judge the quality of TME for rectal cancer. With this direct interdisciplinary assessment instrument, we establish a new role of the pathologist in quality control.

Margin Issues: CRM and TME

- Complete (or near complete) TME vs incomplete TME judged by gross exam predicts local recurrence
Margin Issues
Circumferential vs. Distal

- UK pathologist guidelines: No histology if radial margin > 3 cm.
- Distal margin of 2 cm adequate
  - 1 cm probably adequate for T1-2 tumors
Circumferential (radial) Resection Margin

CRM

• CRM is likely the single most critical factor in predicting local recurrence of rectal cancer.
Assessment of Quality in TME

• Incomplete
  ▪ Little bulk to the mesorectum
  ▪ Defects in the mesorectum down to the muscle wall

• Complete
  ▪ Bulk to the mesorectum
  ▪ No defects > 5 mm, none to the muscle
  ▪ No visible muscle except at the levators
Quality of the TME Specimen

- Intact bulky mesorectum with smooth surface.
- No coning towards the distal margin
- Smooth CRM with transverse sectioning.
Margin Issues: CRM

- Microscopic CRM
  - Clearance of 0-1 mm: recurrence rate = 25%
  - Clearance of > 1mm: recurrence rate = 3-5%
  - Without adjuvant radiation!
Margin Issues: CRM

- Despite importance of CRM in rectal cancer, CRM was reported in only 21% of cases in the NCCTG rectal cancer trial conducted up to 1992.
What are the factors that affect the quality of TME and CRM?

• Belgium project on rectal cancer
• Complete TME 21%, near complete 47%, incomplete 32%
• Multivariate analysis: significant negative factors were:
  ▪ BMI
  ▪ Poor response to neoadjuvant treatment
  ▪ Laparoscopic approach.

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LAR Specimen Assessment

Shiny Visceral
Mesorectal Fascia
The Surgeon and the Pathologist in patients with Rectal Cancer

- Face-to-face communication with the specimen.
- CRM reported in all cases.
- Quality of TME assessed in all cases.
- Mesenteric margin
- Distal (mucosal) margin