COLON CANCER PRESENTING AS LARGE BOWEL OBSTRUCTION

DAVID RADVINSKY, PGY-4
SUNY DOWNSTATE UNIVERSITY

1/8/2015
Case Presentation

- 6/9/2013 – Presented to the University Hospital of Haiti (HUEH) in Port-Au-Prince, Haiti with a large bowel obstruction presumably caused by an incarcerated ventral hernia
Case Report

- OR – Exploratory Laparotomy - Incidental finding of transverse colon mass causing obstruction – unclear if it was associated with the hernia

- Transverse colectomy with end colostomy performed
Case Report

- **Pathology - Stage IIA:**
  - Adenocarcinoma moderately differentiated
  - Resection margins clear
  - Invades through the muscularis propria into pericolectal tissue *(T3)*
  - 0/2 lymph nodes *(N0)*
Question:

- What is the optimal amount of lymph nodes needed for adequate staging per NCCN guidelines:
  - 8
  - 9
  - 12
  - 14
51 yo male presents with end colostomy for colostomy reversal

- PMHx: HTN
- PSHx: none
- Allergies: NKDA
- SHx: no EtOH or smoking
- FHx: no hx of colorectal cancer
- Meds: Norvasc, Triameterene-HCTZ

CT Scan: negative for metastasis
Case Presentation

- 8/2013 – Oncology for adjuvant chemotherapy - **but** did not have adjuvant chemo because of travel back to Port-Au-Prince

- 4/2014 – adjuvant FOLFOX – 12 cycles
  - FOL– **Folinic acid** F – **Fluorouracil** OX – **Oxaliplatin**
  - Complicated by peripheral neuropathy and fatigue

- 4/2014 – General surgery clinic for colostomy reversal

- 10/22/2014 - **Colonoscopy** - Normal colon from the stoma. Stump length - 20 cms with stool at the end **precluding full exam**

- 10/28/2014 – **Barium Enema** - Large intraluminal filling defects likely represents retained stool in colonic remnant. Minimal opacification beyond defects to the distal transverse colon.
Operation & Post-Op

- Exploratory laparotomy, end colostomy takedown, colo-colonic anastomosis, repair of parastomal hernia
  - Pathology: viable resection margin
  - EBL: 100mL

- POD#2 – CTA negative for PE

- POD#7 – Surgical Site Infection. Midline wound opened. Clinically improved.

- Discharged POD#11 and finished 10 day course of antibiotics
Questions?
Question

- Is there any literature to support completion lymphadenectomy at the time of colostomy reversal to provide adequate staging and possibly change the need for adjuvant therapy?
Outline

- Obstructing colon cancer
- Principles of resection
- Lymph node evaluation in staging
- Extended lymphadenectomy
- Re-exploration for lymph node evaluation
Obstructing Colon Cancer

- 15% of patients with newly diagnosed colon cancer will present as colonic obstruction, requiring emergent surgery.

- Postoperative mortality ranges from 15 to 20% versus 1 to 5% for elective surgery. Morbidity rate of 40-50%.

- The most common location for obstructing colorectal cancer is the sigmoid colon, and >60% of tumors are located distal to the splenic flexure.
Diagnosis and Staging

- Present with weight loss, colicky abdominal pain and distension with varying degrees of alteration in bowel habits
  - ± Nausea/vomiting – competency of ileocecal valve, distal focus of obstruction

- Diagnosis
  - CT - triple contrast
    - Sensitivity of 96% and specificity – 93%
  - Hydrosoluble contrast enema
    - Sensitivity of 80% and Specificity – 100%
  - Colonoscopy – not readily available in ED
    - Direct visualization
    - Endoluminal stents
Surgical options

- Right sided
  - Right hemicolecotomy
    - Anastomotic leak rate of 2.8 – 4.6%

- Left sided
  - 3 – stage procedure - proximal colostomy, second-stage tumor resection, and third-stage stoma closure.

  - Hartmanns Procedure
    - Stomas permanent in 40% of patients
    - Subtotal colectomy – synchronous lesions- 5%
    - Primary anastomosis
      - ± defunctioning loop ileostomy
      - ± on table lavage
    - Endoscopic stent placement – palliative vs. bridge
Principles of Colon Cancer Treatment

- Surgical resection is the foundation of curative treatment for localized colon cancer - R0 resection
- Extent of resection of the affected colonic segment dictated by vascular supply
- En bloc resection of the associated draining lymph nodes to the level of the origin of the primary blood supply
- Thorough exploration for extracolonic tumor spread to the liver, omentum, hemidiaphragm, abdominal wall, and pelvis.
- Well-vascularized, tension-free anastomosis
Staging Colon Cancer

Table 1. Definitions for T, N, M

**Primary Tumor (T)**
- TX: Primary tumor cannot be assessed
- T0: No evidence of primary tumor
- Tis: Carcinoma in situ: intraepithelial or invasion of lamina propria
- T1: Tumor invades submucosa
- T2: Tumor invades muscularis propria
- T3: Tumor invades through the muscularis propria into the pericolorectal tissues
- T4a: Tumor penetrates to the surface of the visceral peritoneum
- T4b: Tumor directly invades or is adherent to other organs or structures

**Regional Lymph Nodes (N)**
- NX: Regional lymph nodes cannot be assessed
- N0: No regional lymph node metastasis
- N1: Metastasis in 1-3 regional lymph nodes
- N1a: Metastasis in one regional lymph node
- N1b: Metastasis in 2-3 regional lymph nodes
- N1c: Tumor deposit(s) in the subserosa, mesentery, or nonperitonealized pericolonic or perirectal tissues without regional nodal metastasis
- N2: Metastasis in four or more regional lymph nodes
- N2a: Metastasis in 4-6 regional lymph nodes
- N2b: Metastasis in seven or more regional lymph nodes

**Distant Metastasis (M)**
- M0: No distant metastasis
- M1: Distant metastasis
- M1a: Metastasis confined to one organ or site (e.g., liver, lung, ovary, nonregional node)
- M1b: Metastases in more than one organ/site or the peritoneum

<table>
<thead>
<tr>
<th>Stage</th>
<th>T</th>
<th>N</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 0</td>
<td>Tis</td>
<td>N0</td>
<td>M0</td>
</tr>
<tr>
<td>Stage I</td>
<td>T1/T2</td>
<td>N0</td>
<td>M0</td>
</tr>
<tr>
<td>Stage II</td>
<td>T3/T4</td>
<td>N0</td>
<td>M0</td>
</tr>
<tr>
<td>IIA</td>
<td>T3</td>
<td>N0</td>
<td>M0</td>
</tr>
<tr>
<td>IIB</td>
<td>T4a</td>
<td>N0</td>
<td>M0</td>
</tr>
<tr>
<td>IIIC</td>
<td>T4b</td>
<td>N0</td>
<td>M0</td>
</tr>
<tr>
<td>IIIA</td>
<td>T1–T2</td>
<td>N1</td>
<td>M0</td>
</tr>
<tr>
<td>IIIB</td>
<td>T3–T4a</td>
<td>N1</td>
<td>M0</td>
</tr>
<tr>
<td>IIIBC</td>
<td>T2–T3</td>
<td>N2a</td>
<td>M0</td>
</tr>
<tr>
<td>IIID</td>
<td>T1–T2</td>
<td>N2b</td>
<td>M0</td>
</tr>
</tbody>
</table>
Lymph node dissection

- Current standards for Stage I, II, and III colon cancer include adequate resection of primary tumor and adequate lymph node dissection.

- Lymph node dissection plays an important role in prognostication and specifically differentiates between stage II and III disease.

- Increased lymph node harvest and evaluation is associated with improved survival in patients with Stage II disease.
Lymph node Staging

- Accuracy of lymph node staging
  - Extent of surgical lymph node removal
  - Identification of lymph node metastases by the pathologist
  - **Absolute number of retrieved lymph nodes**
  - Absolute number of positive lymph nodes
  - Lymph node ratio
  - Extracapsular invasion
The 1990 Working Party Report to the World Congresses of Gastroenterology recommended evaluation of at least 12 lymph nodes.

- Correct diagnosis in 90% of cases for N0 disease

- No randomized controlled trials

- Only Grade C or level III evidence
# Supportive Studies

<table>
<thead>
<tr>
<th>Reference</th>
<th>Year</th>
<th>Data Set (No. of Cases)</th>
<th>Recommended No. of Lymph Nodes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swanson et al</td>
<td>2003</td>
<td>NCDB (35,787)</td>
<td>≥12</td>
</tr>
<tr>
<td>Prandi et al</td>
<td>2002</td>
<td>Clinical trial (3248)</td>
<td>≥12</td>
</tr>
<tr>
<td>Goldstein</td>
<td>2002</td>
<td>Hospital (2427)</td>
<td>As many as possible (≈30)</td>
</tr>
<tr>
<td>LeVoyer et al</td>
<td>2003</td>
<td>Clinical trial (3411)</td>
<td>20</td>
</tr>
<tr>
<td>Scott and Grace</td>
<td>1989</td>
<td>Hospital (103)</td>
<td>≥13</td>
</tr>
</tbody>
</table>
Various studies support examining anywhere from 7 to 40 lymph nodes.

Table 1

<table>
<thead>
<tr>
<th>Minimum lymph node sampling recommended for a correct staging</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td>Under 12 LNs</td>
</tr>
<tr>
<td>--------------</td>
</tr>
<tr>
<td>n</td>
</tr>
<tr>
<td>Caplin et al([65])</td>
</tr>
<tr>
<td>Maurel et al([66])</td>
</tr>
<tr>
<td>Mekenkamp et al([67])</td>
</tr>
<tr>
<td>Yoshimatsu et al([26])</td>
</tr>
<tr>
<td>Sarli et al([35])</td>
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<tr>
<td>Cianchi et al([68])</td>
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</tbody>
</table>

LN: Lymph node.
Conventional surgery versus extensive resection in terms of lymph node count, node positivity rate and survival.

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Country</th>
<th>Design</th>
<th>Location</th>
<th>Stage (%)</th>
<th>N</th>
<th>Surgical technique</th>
<th>Node count</th>
<th>Node positivity rate</th>
<th>Survival</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rouffet 33</td>
<td>1994</td>
<td>France</td>
<td>Prospective multicenter study</td>
<td>Left colon</td>
<td>I–IV</td>
<td>260</td>
<td>Left segmental colectomy vs left hemicolecotmy</td>
<td>Not investigated</td>
<td>No difference</td>
<td>No difference</td>
</tr>
<tr>
<td>Tagliacozzo 34</td>
<td>1997</td>
<td>Italy</td>
<td>Retrospective single center study</td>
<td>Right Colon</td>
<td>I: 24.3% II: 35.4% III: 40.3%</td>
<td>144</td>
<td>Right hemicolecotmy vs right hemicolecotmy + retropancreatic lymphadenectomy</td>
<td>More nodes after radical resection</td>
<td>No difference</td>
<td>No difference</td>
</tr>
<tr>
<td>Tentes 37</td>
<td>2007</td>
<td>Greece</td>
<td>Prospective single center study</td>
<td>Left colon</td>
<td>I: 10.5% II: 42.7% III: 40.3% IV: 6.5%</td>
<td>124</td>
<td>Left hemicolecotmy vs left hemicolecotmy + periaortic lymphadenectomy</td>
<td>More nodes after radical resection</td>
<td>No difference</td>
<td>No difference except longer survival after radical resection for stage III</td>
</tr>
<tr>
<td>West 36</td>
<td>2010</td>
<td>UK/Germany</td>
<td>Prospective and retrospective multicenter study</td>
<td>Colon</td>
<td>I–IV</td>
<td>89</td>
<td>Hemicolecotmy versus CME a</td>
<td>More nodes after CME a</td>
<td>No difference</td>
<td>Not investigated</td>
</tr>
<tr>
<td>Hashiguchi 37</td>
<td>2011</td>
<td>Japan</td>
<td>Retrospective single center study</td>
<td>Colon</td>
<td>I–IV</td>
<td>914</td>
<td>Left hemicolecotmy with variable extent of lymph node dissection</td>
<td>More nodes after vertical dissection</td>
<td>No difference</td>
<td>Shorter if no vertical node dissection. No influence of main node removal or extent of horizontal node dissection</td>
</tr>
<tr>
<td>West 38</td>
<td>2012</td>
<td>Japan/Germany</td>
<td>Retrospective multicenter study</td>
<td>Colon</td>
<td>I–IV</td>
<td>254</td>
<td>D3 resection vs CME a</td>
<td>More nodes after CME a</td>
<td>No difference</td>
<td>Not investigated</td>
</tr>
</tbody>
</table>

*a* indicates different definitions of complete mesocolic excision (CME).
Lymph node staging in obstruction

- Harvest of less than 12 lymph nodes has been associated with inferior long-term outcomes.
- Recent data suggest that lymph node harvest adequacy during emergency surgery has gradually increased since 1990 to levels equal to elective surgery.
- NOTHING in literature about completion lymphadenectomy
Chemotherapy

- Recommended for patients with positive lymph nodes (stage III)
- For selected patients without lymph node metastases (stage II) but with adverse prognostic or high risk features.
  - Poorly differentiated histology
  - Lymphatic/vascular invasion
  - **Bowel obstruction**
  - Localized perforation
  - Close, indeterminate, or positive margins
  - Inadequate lymph node evaluation

- Stage III survival is equivalent to Stage II patients with inadequate lymph node dissection.
Colostomy reversal

- **Timing**
  - Earliest time for ostomy reversal 3 months.
  - If significant inflammation or peritonitis was involved 6 months.
  - Chemotherapy post surgery - mean time to initiation of adjuvant therapy is 5–6 weeks, over 8 weeks in older patients with more comorbidities.
  - In regards to timing to chemotherapy, a recent systemic review showed that each 4-week delay in chemotherapy results in a 14% decrease in OS, indicating that adjuvant therapy should be administered as soon as the patient is medically able.

- Delay to appropriate adjuvant therapy
Conclusions

- Differing operative principles in emergent vs. elective cancer operations - lymphadenectomy
- Adequate lymph node evaluation is 12 lymph nodes in colorectal cancer despite no level I evidence
- Therapeutic lymphadenectomy has not been shown to increase positive lymph node rate compared to standard resection.
- No studies on completion lymphadenectomy for regional control.
- Stage II colon cancer with high risk features should be considered for adjuvant chemotherapy
References


- Hechenbleikner, Elizabeth, MD; Wick, Elizabeth, MD, FACS. Current Surgical Therapy. Colon Cancer Published January 1, 2014. Pages 213-218. © 2014


- NCCN guidelines – Colon Cancer - 2014