ACS Cancer Research Program (CRP) Educational Series

Surgical Emergencies in Advanced Cancer Patients
January 28, 2021
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Surgical Emergencies in Advanced Cancer Patients - Disclosures Reported

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American College of Surgeons
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American College of Surgeons
Program Objectives

Target Audience
✓ Breast surgeons
✓ Colorectal surgeons
✓ General surgeons
✓ Nurses
✓ Physicians in cancer accredited centers and programs
✓ Surgical oncologists

Learning Objectives
✓ Describe common indications for acute surgical oncology evaluation such as gastric outlet, small bowel or colonic obstruction as well as bowel perforation, neutropenic enterocolitis, anorectal infections and common acute surgical problems such as appendicitis and cholecystitis in advanced cancer patients.
✓ Discuss diagnostic criteria, treatment modalities, expected outcomes, and indicators of outcome for patients requiring surgical consultation for their malignancy or treatment-related complications of their malignancy.
✓ Apply management options including but not limited to when to operate and how to manage pre-, intra-, and postoperative choices to patients under their care.
Moderator

Brian Badgwell, MD, FACS
Section Chief – Gastric, Peritoneal, & Acute Care Surgical Oncology
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Introduction

Brian Badgwell, MD, MS
Section Chief – Gastric, Peritoneal, & Acute Care Surgical Oncology
MD Anderson Cancer Center
Oncologic Emergencies

1) Extra-abdominal Emergencies:
   - Superior Vena Cava Syndrome
   - Spinal Cord Compression
   - Pericardial Tamponade
   - Paraneoplastic Crises
   - Hypercalcemia
   - SIADH
   - Hypoglycemia
   - Tumor Lysis Syndrome
   - Central Venous Catheter Sepsis
Oncologic Emergencies

2) Abdominal Emergencies:
   • Intestinal Obstruction
   • Intestinal Perforation
   • Biliary Obstruction
   • Neutropenic Enterocolitis
   • Hemorrhage

3) Anorectal infections

4) Palliation
Surgical Emergencies

Bowel Obstruction

Cholecystitis & Biliary Problems

Free Air Including Perforation

Abdominal Pain with Neutropenia

Anorectal Pain, Abscess, & Fistula

Palliative Care Considerations
Case Presentation

Patient with recently diagnosed gastric cancer

- Presented through the emergency room with dysphagia, dehydration
- Diagnostic laparoscopy and feeding tube placement, found to have peritoneal disease
Case Presentation

Treated with chemotherapy for 2 treatments

- Readmitted with nausea/emesis, diarrhea, dehydration
- Vital signs normal, abdomen non-tender
- Labs – slightly elevated BUN & Cr
Imaging
Options

**Comfort Care**
- **Risk:**
  Death, may lose several months
- **Benefit**
  No discomfort from surgery,
  Focus on symptom control,
  Limited survival from cancer

**Non-operative**
- **Risk:**
  Sepsis, may lose chance for recovery
- **Benefit**
  Might get through this without surgery, could avoid end ileostomy, possible path back to chemo

**Surgery**
- **Risk:**
  Subtotal colectomy, ileostomy, likely will not get further chemo
- **Benefit**
  Lowest risk of sepsis
## Palliative Surgical Evaluation – how often?

<table>
<thead>
<tr>
<th>Study</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miner, Ann Surg 04</td>
<td>1022 cases/year</td>
</tr>
<tr>
<td></td>
<td>6% of all endoscopic or operative procedures</td>
</tr>
<tr>
<td>McCahill, Ann Surg Onc 02</td>
<td>21% of cancer surgeries (based on self-report survey)</td>
</tr>
<tr>
<td>Badgwell, Support Care Cancer, 09</td>
<td>40% of all inpatient consultations at MDACC</td>
</tr>
</tbody>
</table>

Comprehensive geriatric assessment in cancer patients undergoing abdominal surgery, Badgwell, JSO, 2013
Palliative Surgical Evaluation

Indicators of surgery and survival in oncology inpatients requiring surgical evaluation for palliation

Brian D. Badgwell • Kerrington Smith • Ping Liu • Eduardo Bruera • Steven A. Curley • Janice N. Cormier

What percentage of surgical consults at a cancer center meet the criteria for palliative care?

What are the diagnoses requiring consultation?

## Palliative Surgical Evaluation

40% of all consultations met palliative criteria

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bowel obstruction</td>
<td>191</td>
<td>43</td>
</tr>
<tr>
<td>Wound problems</td>
<td>42</td>
<td>10</td>
</tr>
<tr>
<td>Gastrointestinal bleeding</td>
<td>35</td>
<td>8</td>
</tr>
<tr>
<td>Other</td>
<td>174</td>
<td>39</td>
</tr>
</tbody>
</table>

| Chemo/biotherapy within 6 weeks        | 209    | 47      |
| Neutropenia                            | 38     | 9       |
Palliative Surgical Evaluation

27% of palliative consults required surgical intervention
Palliative Surgical Evaluation

Median survival 2.7 months
Surgical Emergencies

Bowel Obstruction

Cholecystitis & Biliary Problems

Free Air Including Perforation

Abdominal Pain with Neutropenia

Anorectal Pain, Abscess, & Fistula

Palliative Care Considerations
Anorectal Abscess, Fistula, and Pain

Brian Badgwell, MD, MS
Section Chief – Gastric, Peritoneal, & Acute Care Surgical Oncology
MD Anderson Cancer Center
Case Presentation

25 year old male with leukemia, recent relapse

- Last treated with high-dose chemotherapy 5 days ago, plan for BMT
- Admitted with neutropenic fever and perianal pain for 3 days

- 38.4, 99, 95/57
- Perianal tenderness and erythema, no fluctuance

WBC 0.2, Hg 7.7, Plts 28,000
Case Presentation
Anorectal Infections in the Cancer Patient

• Early reports in immunosuppressed cancer patients with mortality as high as 50%

• Immunosuppression, steroid use, recent systemic therapy, previous radiation therapy, chronic pain, cancer-related prognosis

• Treatment may delay subsequent therapy

• Prognosis
Management and Outcomes of Anorectal Infection in the Cancer Patient

Brian D. Badgwell, MD, MS¹, George J. Chang, MD, MS², Miguel A. Rodriguez-Bigas, MD², Kerrington Smith, MD², Philip J. Lupo, MPH³, Ralph F. Frankowski, PhD³, George Delclos, MD, PhD³, Xianglin L. Du, PhD³, and Janice Cormier, MD, MPH²

¹Department of Surgical Oncology, Winthrop P. Rockefeller Cancer Institute, University of Arkansas for Medical Sciences, Little Rock, AR; ²Department of Surgical Oncology, The University of Texas M.D. Anderson Cancer Center, Houston, TX; ³Department of Epidemiology, The University of Texas School of Public Health, Houston, TX

100 Patients

- 24 Perianal inflammatory process
- 76 Abscess
### Treatment

<table>
<thead>
<tr>
<th>Perianal inflammatory process</th>
<th>No Surgery (n=42)</th>
<th>Surgery (n=58)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abscess</td>
<td>20</td>
<td>54</td>
</tr>
</tbody>
</table>

Incision & drainage was the most common procedure (79%)
- With seton (9%)
- With fistulotomy (3%)
Treatment
Treatment & Outcomes

Necrotizing soft tissue infection (n=2)
  • Radical Debridement (1 with colostomy)

Only 19% were neutropenic at time of surgery

Recurrent infection in 17%
Fistula-in-ano in 9%
In-hospital mortality related to anorectal infection (n=1)
Associated Survival Outcomes

Kaplan Meier estimates of survival for the entire cohort. Median survival was 14.4 months (95%CI 7.9-19.5)
Conclusions

- First rule out the necrotizing soft tissue infection
- Nonoperative management is a viable option – 42%
- Identification of an abscess, erythema on physical exam, and lack of thrombocytopenia were associated with surgery
Anorectal complications in patients with haematological malignancies


• Positive blood cultures in 33%: Enterococcus, Klebsiella, E. coli

• 86% of non-septic recovered, and 85% of septic recovered

• Overall mortality 2.4%, 1 patient (1%) died due to perianal sepsis
Treatment Summary

• Immunocompetent without need for systemic: Incision & drainage for any identified abscess

• Perirectal fluid on imaging without erythema/ﬂuctuance: can be considered for nonoperative management
  – Neutrophil count
  – Platelets count
  – Performance status
  – Timing of systemic therapy
Immunocompromised patient or need for urgent systemic therapy

- Exam under anesthesia, drainage, treatment of associated fistulae
- Incise abscess
- Identify fistula tract, draining seton
- Once/if immune system recovers, can consider a definitive procedure for fistula
Free Air Including Perforation

Brian Badgwell, MD, MS
Section Chief – Gastric, Peritoneal, & Acute Care Surgical Oncology
MD Anderson Cancer Center
Pneumoperitoneum

- Pneumoperitoneum = the presence of gas (as air) in the peritoneal cavity
- Often mandates an emergent laparotomy
- Pneumoperitoneum is caused by bowel perforation in ~90% of cases
- Remaining 10% result from barotrauma, gynecologic insufflation, and retained postoperative or postprocedural air
Nonsurgical Pneumoperitoneum

- Defined as the presence of air in the peritoneal space that is detectable by imaging and either managed successfully by observation or results in a nondiagnostic laparotomy

- Most cases after medical/procedural intervention

- Early descriptions describe as “benign pneumoperitoneum”, “asymptomatic pneumoperitoneum”, or “misleading pneumoperitoneum”

- Review- 196 cases reported, largest single series = 8 patients

Pneumoperitoneum in the Cancer Patient

**Increased risk for pneumoperitoneum:**
- Local tumor invasion
- Immunosuppression
- Radiation therapy
- Chemotherapy
- Frequent endoscopic procedures
Pneumoperitoneum in the Cancer Patient

• **Influence surgical decision-making:**
  - Neutropenia
  - Chemotherapeutic side effects
  - Radiation therapy
  - Steroid use
  - Chronic pain

• Choice of treatment that represents the best balance between clinical presentation and oncologic prognosis can pose a dilemma

• Scarce literature addressing the cancer patient
Case Presentation

46 year old female with stage 4 colorectal cancer, carcinomatosis, and lung metastases

- Treated with 5FU, leucovorin, & oxaliplatin 24 hours ago
- Acute onset of abdominal pain, nausea, vomiting
- Called to see patient in ER for finding of pneumoperitoneum on CT scan

- AF, 116, 119/78
- Exam notable for diffuse abdominal tenderness, no peritoneal signs

- WBC count 6.8
Case Presentation
Purpose:

To characterize the clinical presentation, management, and outcome of patients with cancer and pneumoperitoneum
Methods

- **Study population:** patients with evidence of pneumoperitoneum on radiographic imaging as identified by chart review

- **Exclusion criteria:** abdominal surgery within 30 days, pneumoperitoneum secondary to respiratory trauma, or intraperitoneal air only in association with intraperitoneal abscess formation

- **Groups:**
  1. Comfort Care
  2. Non-Operative
  3. Surgical
## Patient Demographics

<table>
<thead>
<tr>
<th>Table</th>
<th></th>
<th>Comfort Care n=19 (%)</th>
<th>Non-Operative Management N=33 (%)</th>
<th>Surgery n=72 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median Age, y (range)</td>
<td>62 (18-92)</td>
<td>62 (45-76)</td>
<td>61 (31-83)</td>
<td></td>
</tr>
<tr>
<td>Origin of Pneumoperitoneum</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gastroesophageal</td>
<td>0</td>
<td>2 (6)</td>
<td>2 (3)</td>
<td></td>
</tr>
<tr>
<td>Small Bowel</td>
<td>1 (5)</td>
<td>5 (15)</td>
<td>18 (25)</td>
<td></td>
</tr>
<tr>
<td>Colorectal</td>
<td>3 (16)</td>
<td>12 (36)</td>
<td>48 (67)</td>
<td></td>
</tr>
<tr>
<td>Indeterminate</td>
<td>15 (79)</td>
<td>14 (42)</td>
<td>4 (6)</td>
<td></td>
</tr>
<tr>
<td>Disease Stage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>0</td>
<td>1 (3)</td>
<td>4 (6)</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>0</td>
<td>3 (9)</td>
<td>3 (4)</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>0</td>
<td>2 (6)</td>
<td>10 (14)</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>17 (89)</td>
<td>23 (70)</td>
<td>47 (65)</td>
<td></td>
</tr>
<tr>
<td>Unstaged</td>
<td>2 (11)</td>
<td>4 (12)</td>
<td>8 (11)</td>
<td></td>
</tr>
</tbody>
</table>
### Length of Hospital Stay and 30-day Morbidity & Mortality

<table>
<thead>
<tr>
<th></th>
<th>Non-operative N=33 (%)</th>
<th>Surgery N=72 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median LOS, d (range)</td>
<td>8 (0-50)</td>
<td>16 (2-77)</td>
</tr>
<tr>
<td>Complications</td>
<td>13 (39%)</td>
<td>33 (46%)</td>
</tr>
<tr>
<td>30-day Mortality</td>
<td>4 (12%)</td>
<td>11 (15%)</td>
</tr>
</tbody>
</table>
Kaplan-Meier curves for overall survival according to whether pneumoperitoneum was treated with surgery (n = 72) or non-surgical management (n = 33)
Conclusions

• Most patients treated with surgery

• Treatment was based on patient, family, and practitioner decisions in the context of the clinical presentation and with respect to oncologic prognosis.

• Not applicable to population without advanced cancer

• It is okay to refrain from operative intervention in some situations and may not result in 100% mortality
Management of Bevacizumab-associated Bowel Perforation

Brian D. Badgwell, MD\textsuperscript{1}, E. Ramsay Camp, MD\textsuperscript{1}, Barry Feig, MD\textsuperscript{1}, Robert A. Wolff, MD\textsuperscript{2}, Cathy Eng, MD\textsuperscript{2}, Lee M. Ellis, MD\textsuperscript{1,3}, Janice N. Cormier, MD, MPH\textsuperscript{1}

\textsuperscript{1}Department of Surgical Oncology, \textsuperscript{2}Department of Medical Oncology, \textsuperscript{3}Department of Cancer Biology

Background

• The efficacy of bevacizumab, a humanized monoclonal antibody to VEGF (Avastin; Genentech, San Francisco, CA), in combination with chemotherapy has been demonstrated in several prospective, randomized phase III studies.\(^1\)\(^-\)\(^3\)

• Being studied as part of the treatment regimen in a wide range of malignancies.

• Toxicity profile acceptable but includes hypertension, proteinuria, delayed wound healing, arterial thrombosis, and bleeding.

• GI perforation is a rare but well documented complication with incidence of \(~1\) to \(2\%\).

Results

- We identified 1,442 patients who had been treated with bevacizumab over the study period with perforation occurring in 24 (1.7%)
Results

• 20 – Non-operative treatment
  – 7 Required drains

• 1 patient failed non-operative treatment for a perforated diverticulitis with abscess formation
Results

4 treated with immediate surgical exploration.

• 2 had perforated appendicitis.

• 1 patient perforated at the site of a GE junction tumor & underwent a gastrectomy with cervical esophagostomy

• 1 patient developed a perforation in the setting of ovarian carcinomatosis requiring a diverting loop jejunostomy.
• The 30-day post-perforation mortality rate was 12.5% (n=3/24)

• 60-day mortality rate was 25% (n=6/24)

• Median overall survival time after bevacizumab-associated perforation was 12.5 months
Conclusions

• The low incidence (1.7%) of bevacizumab-associated bowel perforation in the present study appears to mirror that seen in earlier trials.

• Higher rates of perforation can be expected in patients with ovarian, pancreatic, or gastroesophageal cancer.

• Nonetheless, this serious adverse event can be managed successfully in selected patients without surgical intervention.

• Model for other/new agents
Summary

• Most often advanced cancer and palliative scenarios

• Different presentation and treatment from non-cancer population

• Palliative care principles – goals of care

• Can the patient recover back to a meaningful quality of life

• Extremely challenging discussions at transition from therapeutic to palliative treatment
Hepatobiliary Emergencies in Cancer Patients

Travis E. Grotz, MD | Mayo Clinic
Hepatobiliary Emergencies

- Bleeding
- Obstruction
- Infection
Hepatobiliary Emergencies

- Bleeding
- Obstruction
- Infection
HPB Bleeding Emergencies

7.9 x 7.6 x 7.2 cm solid mass with arterial enhancement and washout on delays

Blood products here and in the pelvis
HPB Bleeding Emergencies

Pre-embolization

Post-embolization
Post-embolization

Post-procedure scan shows necrosis and decrease from 8 cm to 6 cm.
HPB Bleeding Emergencies

- Patients may present with
  - Hemorrhagic shock
  - RUQ/Back/shoulder pain
  - Abdominal distension
  - Peritonitis

- Spontaneous rupture of HCC is reported in 3% of cases
- Benign tumors- adenoma, less likely FNH or hemangioma
- Intrahepatic metastasis from lung, colon or renal cell carcinoma and melanoma
- Iatrogenic following perc liver biopsy, PTC or endoscopic biliary procedures (risk is 1-2%)
HPB Bleeding Emergencies

Management

- Resuscitation and stabilization of hemorrhagic shock
- Interventional radiology for embolization
- Slow oozing from tumors may be managed with radiation
HPB Bleeding Emergencies

Subscapular hematoma- may result from PTC, biopsies etc.

Site of rupture may not be the site of hemorrhage
Open Glisson’s capsule to expose the bleeding vessel
Obtain hemostasis at site of bleeding and entire area of stripped capsule

Hepatobiliary Emergencies

Obstruction

Bleeding

Infection
HPB Obstruction Emergencies

Arises from

• Hepatic, biliary or pancreatic tumors, hepatoduodenal lymphadenopathy, radiation or anastomotic strictures

Presents with

• Jaundice, acholic stools, tea-colored urine, pruritus and/or cholangitis
HPB Obstruction Emergencies

Endoscopic biliary drainage
- Plastic stents- removable, least durable
- Covered metal stents- most durable and removable but expensive
- Uncovered metal stents- moderate durable and not removable
- Risk of perforation pancreatitis and re-obstruction

Percutaneous biliary drainage
- Risk of bleeding
- Success and complication rates similar to EBD
- Electrolyte abnormalities and tube dislodgement
- Cholecystostomy tube is an alternative option

Surgical biliary drainage
- Trade off for increased initial complications for longer durability and fewer readmissions
- Consider in operative candidates with life expectancy > 6 months
Obstruction w/ Infection = Emergency

Endobiliary pressure $> 20 \text{ cm H}_2\text{O}$

BILIARY-VENOUS REFLUX

No basal membrane between sinusoids and small biliary ducts

bacteria\hspace{2cm}toxins

Systemic circulation
Hepatobiliary Emergencies

Infection

Obstruction

Bleeding
Distended gallbladder, wall thickening, pericholecystic fluid and fat stranding. No stones.
HPB Infection Emergencies

Has bilateral bare metal stents in a Y-configuration. Percutaneous cholecystostomy catheter was placed and initial contrast injection shows a non-patent cystic duct.

6 weeks later contrast shows patent cystic duct and the catheter was removed with no recurrence of cholecystitis.
HPB Infection Emergencies


10% Pts good operative candidates

20% failure rate with abx alone

½ Pts go onto IC
## Infection

<table>
<thead>
<tr>
<th>Expected survival (months)</th>
<th>Low risk of recurrence (10–20 %)</th>
<th>Moderate risk of recurrence(^a) (20–30 %)</th>
<th>High risk of recurrence (30–40 %)(^b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>No cholecystectomy</td>
<td>No cholecystectomy</td>
<td>Perform cholecystectomy</td>
</tr>
<tr>
<td>6</td>
<td>No cholecystectomy</td>
<td>No cholecystectomy</td>
<td>Perform cholecystectomy</td>
</tr>
<tr>
<td>12</td>
<td>No cholecystectomy</td>
<td>Perform cholecystectomy</td>
<td>Perform cholecystectomy</td>
</tr>
<tr>
<td>24</td>
<td>Perform cholecystectomy</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) Patients with only one risk factor for cholecystitis may be considered at moderate risk

\(^b\) Patients with multiple risk factors for cholecystitis or concern for isolated/symptomatic metastases

Hepatobiliary Emergencies

- Bleeding
- Obstruction
- Infection
Management of HPB malignancies

- Individualized based on
  - Current clinical status
  - Surgical risk
  - Current and future cancer treatments
  - Overall prognosis
Abdominal Pain in the Setting of Neutropenia

Christopher Scally, MD, MS
Assistant Professor, Surgical Oncology
University of Texas M.D. Anderson Cancer Center
Background

- Abdominal pain is a relatively common complaint in patients undergoing cytotoxic chemotherapy with neutropenia
- More common in patients with hematologic malignancies
- Differential Diagnosis is broad:
  - Early case series of 58 patients noted 26 different clinical diagnoses
Background

• Most literature focuses on Neutropenic Enterocolitis
  – Neutropenic Enteropathy
  – Necrotizing Colitis
  – Typhlitis (Confined to cecum)

• Clinical Criteria for Diagnosis:
  – Neutropenia (<1000 WBC/uL)
  – Fever
  – Abdominal pain
  – Bowel wall thickening on imaging
Background

- Historical Literature:
  - High mortality
  - Dismal results with surgical intervention (30-50% 30-day postoperative mortality, high complication rates)
Challenges in Surgical Management of Abdominal Pain in the Neutropenic Cancer Patient

Brian D. Badgwell, MD,* Janice N. Cormier, MD, MPH,* Curtis J. Wray, MD,* Gautam Borthakur, MBBS,† Wei Qiao, MS,‡ Kenneth V. Rolston, MD,§ and Raphael E. Pollock, MD, PhD*

• 60 patients undergoing surgical consultation for abdominal pain in the setting of neutropenia
• 58/60 patients received chemotherapy <8 weeks from surgical consult (median 10 days)
• 72% had hematologic malignancy
• High rates of comorbidity (68% at least one acute medical condition or coexisting infection)
• Lengthy hospital stay (12.5 days)
Contemporary Cohort

- Neutropenic enterocolitis most common etiology but <1/3 of cases
- All patients treated with broad spectrum antibiotics
- 73% treated with G-CSF stimulants
- 9 patients (15%) underwent operative intervention
  - 2 immediately
  - 5 surgery delayed to allow counts to recover
  - 2 developed late complications requiring surgery

### TABLE 1. Study Population Demographics and Diagnoses (n = 60)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>No. Patients</th>
<th>% of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median age, yrs (range)</td>
<td>58 (22–84)</td>
<td>—</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>31</td>
<td>52</td>
</tr>
<tr>
<td>Female</td>
<td>29</td>
<td>48</td>
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<tr>
<td>Malignancy</td>
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<td></td>
</tr>
<tr>
<td>Hematologic</td>
<td>43</td>
<td>72</td>
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<tr>
<td>Solid tumor</td>
<td>17</td>
<td>28</td>
</tr>
<tr>
<td>Median ANC ×1000 cells/µL (range)</td>
<td>0.17 (0–0.99)</td>
<td>—</td>
</tr>
<tr>
<td>Median duration of neutropenia, d (range)</td>
<td>9 (1–120)</td>
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<td>Cause of abdominal pain</td>
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<td>Neutropenic enterocolitis</td>
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<td>28</td>
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<tr>
<td>Small bowel obstruction</td>
<td>7</td>
<td>12</td>
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<tr>
<td><em>Clostridium difficile</em> colitis</td>
<td>4</td>
<td>7</td>
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<tr>
<td>Diverticulitis</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Appendicitis</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Cholecystitis</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Colonic pseudo-obstruction</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Splenic rupture</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Unclear</td>
<td>21</td>
<td>35</td>
</tr>
</tbody>
</table>

ANC indicates absolute neutrophil count.
Contemporary Cohort

- Overall poor outcomes:
  - 19/60 patients died in hospital
  - 2 discharged to hospice
- 30 day mortality 30%
- 90 day mortality 52%

- 9 surgical patients:
  - 3 deaths – none within 30 days
    - 10 mo, 11 mo, 3 mo
  - 3 surgical complications
Principles of Management

- Maintain broad differential
- Aggressive medical therapy
- Early onboarding of palliative/supportive care
- Realistic discussion of prognosis
- Non-operative/interventional radiology strategies
- Delay operative intervention when feasible
Thank You
Christopher Scally, MD, MS
cpscally@mdanderson.org
References

Bowel Obstruction in Advanced Cancer Patients

Alisa N Blumenthaler, MD
Bowel Obstruction in Advanced Cancer Patients

• Causes:
  • Benign (~20%)
    • Adhesions
    • Hernia
    • Inflammation
Bowel Obstruction in Advanced Cancer Patients

• Causes:
  • Benign (~20%)
    • Adhesions
    • Hernia
    • Inflammation
Bowel Obstruction in Advanced Cancer Patients

• Causes:
  • Benign (~20%)
    • Adhesions
    • Hernia
    • Inflammation
  • Malignant (~70%)
    • Intact primary tumor
    • Local recurrence
    • Intra-abdominal metastasis
    • Peritoneal disease
    • Mesenteric masses
    • Functional (invasion of nerve plexuses)

Baron, Current Oncology Reports 2009; Pujara et al. JACS. 2017
Malignant Bowel Obstruction (MBO)

- Burden of disease
  - 1,103,528 discharges in 2010
  - 13% of inpatient hospital admissions
- Most common indication for Palliative Surgery consultation

Management

- Options:
  - Medical
  - Surgical
  - Non-surgical procedures (endoscopy, IR)
- Worse OS after endoscopy/IR procedures compared to others
  - 2/2 disease status

<table>
<thead>
<tr>
<th></th>
<th>GOO</th>
<th>SBO</th>
<th>LBO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgery</td>
<td>44%</td>
<td>25%</td>
<td>57%</td>
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<tr>
<td>Medical</td>
<td>22%</td>
<td>52%</td>
<td>25%</td>
</tr>
<tr>
<td>Endoscopy/IR</td>
<td>34%</td>
<td>24%</td>
<td>18%</td>
</tr>
</tbody>
</table>

Treatment Options

- Surgical Options for MBO:
  - Bypass
  - Resection
  - Ostomy

- Outcomes:
  - Complications 7-58%
    - Wancata et al: 44% v 27% in benign obstruction
  - Postoperative mortality up to 32%
Hospital utilization and disposition among patients with malignant bowel obstruction: a population-based comparison of surgical to medical management

Sarah B. Bateni, Alicia A. Gingrich, Susan L. Stewart, Frederick J. Meyers, Richard J. Bold, and Robert J. Canter

- Medical management:
  - Higher rates of re-obstruction, operation within 1 yr
- Surgical management:
  - Higher rates in-hospital death
  - Lower rates of discharge to home
- No difference in OS (~6.5 months)
Treatment Options

- Increased morbidity:
  - Age
  - Male sex
  - American Society of Anesthesiologists score
  - Cirrhosis
  - Sepsis
  - Hypoalbuminemia
  - Small bowel resection

- Increased mortality:
  - Age
  - Hypoalbuminemia
  - Ascites
  - # disease sites on imaging
  - Disseminated carcinomatosis
  - Abdominal visceral metastasis
  - Intact primary tumor or local recurrence
  - Chemo within 6 months
  - Performance Status
  - Non-colorectal cancer primary

Treatment Options

- Contraindications to operation:
  - Ascites
  - Carcinomatosis
  - Multiple sites of obstruction
  - Hypoalbuminemia
  - Palpable intra-abdominal masses
Treatment Options – Non-operative

- Self-expandable metal stents:
  - Duodenal obstruction:
    - Technical success 97%, clinical success 90%
    - Re-obstruction 20%, migration 5%
    - Compared to Gastrojejunostomy:
      - Similar technical success
      - Similar complication rates
      - Shorter hospital stay
      - More common re-obstruction
    - Benefits may not be realized in cases of peritoneal carcinomatosis
  - In general, stent for patients with anticipated short survival; consider surgery when prognosis is more hopeful.

Treatment Options – Non-operative

- Self-expandable metal stents:
  - LBO:
    - Technical success 93%, clinical success 91%
    - Perforation 3.8%
    - Re-obstruction 7.3%, migration 15%
  - Compared to open surgery:
    - Shorter LOS
    - Fewer serious adverse events

Baron, Current Oncology Reports 2009; Jeurnink, BMC Gastroenterology, 2007
Treatment Options – Non-operative

- Decompressive tubes:
  - Gastrostomy:
    - When luminal patency cannot be achieved
    - Symptom palliation
    - Relative contraindication: ascites
  - Jejunostomy
- Medications
  - Somatostatin analogs, pro-kinetic, anti-nausea

Survival - Optimal Outcome Measure?

- Overall, the prognosis for patients with MBO is poor.
  - OS ranges 3-6 months in most studies

- The optimal outcome is poorly defined:
  - Survival?
  - Symptom improvement?
  - QOL?

Median Survival:
- GOO – 2.7 months
- SBO – 3.5 months
- LBO – 7 months

Kaplan-Meier survival estimates

Median Survival:
- GOO – 2.7 months
- SBO – 3.5 months
- LBO – 7 months


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Optimal Outcomes – Symptom Improvement

Selective Approach for Patients with Advanced Malignancy and Gastrointestinal Obstruction

Deep Pujara, MPH, Yi-Ju Chiang, MSPH, Janice N Cormier, MD, MPH, FACS, Eduardo Bruera, MD, Brian Badgwell, MD, FACS

- Factors negatively associated with eating at discharge:
  - Intact primary/local recurrence
  - Carcinomatosis
  - Albumin < 3.5
- No difference in tolerance of diet at discharge based on intervention type (surgery v medical v endoscopy/IR)
Optimal Outcomes – Symptom Improvement

Outcome of Palliative Operations for Malignant Bowel Obstruction in Patients With Peritoneal Carcinomatosis From Nongynecological Cancer

Sarah L. Blair, MD, David Z. J. Chu, MD, and Roderich E. Schwarz, MD

- 45% discharged tolerating a regular diet
- Factors negatively associated with tolerating solid food:
  - SBO
  - Ascites
  - Albumin < 3.5

Optimal Outcomes - QOL

- QOL considered as outcome for decision-making
- Lack of QOL and patient reported outcomes data
- High attrition rates due to short survival, and high symptom burden
Optimal Outcomes

- Optimal outcomes and optimal treatment approaches remain elusive.
- The decision-making process is complex
  - Include: patients and their families
  - Assess: goals and values
  - Considerations:
    - Disease specific
    - Treatment options
    - Patient wishes
Complex Decision-Making

Pujara et al. JACS. 2017
Complex Decision-Making

Pujara et al. JACS. 2017
Complex Decision-Making

- Imaging extent of disease
- Future treatment options
- Recent chemotherapy
- Obstruction site: goo, sbo, lbo
- Obstruction cause: adhesions, tumor, unknown
- Prognosis
- Palliative surgery for bowel obstruction
Complex Decision-Making

- Imaging extent of disease
- Future treatment options
- Nutritional status
- Recent chemotherapy
- Palliative surgery for bowel obstruction
- Obstruction site: goo, sbo, lbo
- Obstruction cause: adhesions, tumor, unknown
- Prognosis

Pujara et al. JACS. 2017

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Complex Decision-Making

- Imaging extent of disease
- Nutritional status
- Patient functional & performance status
- Prognosis
- Palliative surgery for bowel obstruction
- Future treatment options
- Recent chemotherapy
- Obstruction site:goo, sbo, lbo
- Obstruction cause: adhesions, tumor, unknown
- Patient preference - Risks / benefits - Goals
- Surgeon preference - Risks/benefits - Goals

Pujara et al. JACS. 2017
Ongoing Trial

- SWOG S1316 (NCT #02270450):
  - Multi-institutional hybrid observational - randomized clinical trial
  - Patients with intra-abdominal cancer and MBO
  - Compare outcomes after therapeutic surgical intervention vs non-operative management
  - Including symptom improvement, PROs
Palliative Care

- Interdisciplinary approach
- Four domains of QOL:
  - Physical
  - Functional
  - Psychosocial
  - Spiritual
- Patients with MBO experience significant QOL altering symptoms:
  - Nausea/vomiting, pain, feeling ill, side effects
- NCCN guidelines: malignant bowel obstruction or requiring palliative stenting or venting gastrostomy tube.

Cella, J Pain and Symptom Management, 1994;
Badgwell et al, J Surg Oncol, 2014;
Palliative Care

• A recent study:
  • 61% of patients admitted with malignant GI obstruction were referred to Palliative Care service.
  • Lower PC rate in patients treated with surgery
  • Of those without PC consult, 78% stage IV, and 36% related to peritoneal carcinomatosis.

Blumenthaler et al. Amer Coll Surg Clinical Congress. 2020
Palliative Care

• Patients with PC consult receive broader interdisciplinary care.
Summary

- Limited survival in MBO
- High operative risks
- Patient selection is paramount
- Complex decision-making
- High symptom burden, consider Palliative Care involvement
Questions or Comments

ANBlumenthaler@mdanderson.org
@alisab44
Palliative Care Considerations

Caite Hodge, MD/MPH | Palliative Medicine Fellow
WHO Definition Palliative Care

“Palliative care is an approach that improves the quality of life of patients (adults and children) and their families who are facing problems associated with life-threatening illness. It prevents and relieves suffering through the early identification, correct assessment and treatment of pain and other problems, whether physical, psychosocial or spiritual.”

WHO. Palliative Care. 2020. who.int/news-room/fact-sheets/detail/palliative-care
Definition of terms

- **Palliative Care/Supportive Care**
  - Care focused on symptom management and QoL at ANY point during the disease course
  - Not just hospice
- **Surgical Palliative Care**
  - Can be thought of broadly as palliative care for the surgical patient
  - Focuses on QoL, decreasing suffering
- **Palliative Surgery**
  - Part of surgical palliative care
  - Surgical intervention intended to treat symptoms
- **Noncurative Treatment**
  - Intervention to treat patient without curing disease
  - Can be life-prolonging or palliative

Patient Evaluation for Palliative Surgery

• No best metric
• Various criteria have been proposed:¹
  – symptom control, prognosis, preop PS, QoL, tumor burden amenable to palliation, procedure-related M&M, feasibility, non-surgical options, anticipated duration of hospitalization, requirement for additional palliation, and cost
• Framework:²
  – Patient-related considerations
  – Procedure-related considerations
  – Tumor-related considerations

Patient-related Considerations

- Is the patient fit for surgery?

<table>
<thead>
<tr>
<th>Composite Scores</th>
<th>Single Assessments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palliative Index</td>
<td>Karnofsky Performance Score</td>
</tr>
<tr>
<td>(tumor indication, ASA, Cr, active dz)</td>
<td></td>
</tr>
<tr>
<td>UC-Davis Nomogram</td>
<td>Eastern Cooperative Oncology Group (ECOG) Performance Status</td>
</tr>
<tr>
<td>(alb, functional status, DNR, resp function, ascites, Cr, WBCs)</td>
<td></td>
</tr>
<tr>
<td>LENT Score</td>
<td>ASA</td>
</tr>
<tr>
<td>(ECOG, pleural fluid LDH, primary tumor type)</td>
<td></td>
</tr>
<tr>
<td>Glasgow Prognostic Score</td>
<td>NCI Fatigue Score</td>
</tr>
<tr>
<td>(alb, CRP)</td>
<td></td>
</tr>
</tbody>
</table>

Procedure-related Considerations

- Will the procedure relieve the symptoms?
- Durability of symptom relief?
- What are the risks? (Both morbidity/mortality and QoL)
- Are there other treatment options available?
Traditional tools may be less helpful for determining risk

– In a retrospective review of their institutional ACS NSQIP data, Vidri et al found very small numbers of patients with disseminated cancer who had palliative surgery
  • 1.8% of patients had disseminated cancer
  • ¼ of those had a palliative intent

– Rodriguez et al found that the calculator overestimate complications and underestimate other risks (LOS)
  • 31% actual vs 59% predicted complications
  • 5.4 days actual vs 2.9 days predicted LOS
  • Also had small numbers

For appropriately selected patients, palliative surgery can have good results

- Miner et al found 80% of patients reported symptom relief, with median duration of control 135 days\(^1\)
  - Symptom relief decreased to 17% if major surgical complication
  - High morbidity (29%) and mortality (10%)

- Improved to 90% symptom relief, with decreased M&M (20% and 4%) with improved patient selection via Palliative Triangle framework\(^2\)
  - Shared decision-making process includes patient, family and surgeon
  - Evaluates treatment options through lens of the patient’s symptoms/values, likelihood of the intervention to resolve these symptoms, and risks of the procedure

Tumor-related Considerations

• What is the biology of the underlying disease?
• Expected duration of tumor-related symptoms?
• Life expectancy/Disease-related OS
• What is the risk of recurrence/progression?
• Are there post-surgery treatment options for underlying cancer?
Tools for Shared Decision Making
Best Case/Worst Case

• Shared decision-making tool designed for frail older adults facing acute surgery
• Uses narrative and graphics
• Outlines best, worst and most likely case for each treatment option
• Serves as a basis for further discussion

• https://www.hipxchange.org/BCWC
REMAP

• **Reframe**
  – Provide new information, discuss what has changed

• **Expect emotion (& Empathize)**
  – Acknowledge and respond to patient/family emotions

• **Map out patient values**
  – Step back and discuss patient’s values before presenting plan
  – Determine what is most important to the patient
  – Start open-ended, but may need to guide

• **Align with goals**
  – Reflect back and summarize
  – Patient may ask for plan or physician may ask if ok to recommend plan

• **Propose a plan**
  – Propose plan that is most consistent with patient’s values and goals in light of physician’s knowledge about likely outcomes

- [https://www.vitaltalk.org/resources/quick-guides/](https://www.vitaltalk.org/resources/quick-guides/)
- [https://courses.vitaltalk.org/courses/](https://courses.vitaltalk.org/courses/)

When to consult Palliative Care Specialist

- American Society of Clinical Oncology (ASCO)\(^1\)
  - All patients with advanced cancer should get PC consult
  - Early in disease, concurrent with active tx
- National Comprehensive Cancer Network (NCCN)\(^2\)
  - All patients with advanced cancer
  - Poor performance status, MBO, malignant effusion, need for stent or venting G tube
- Palliative care underutilized
  - Review of general surgery pts who died during admission found that only 37% had PC consult\(^3\)

When to consult Palliative Care Specialist

- Patients evaluated for the conditions discussed today should get PC consult, *whether or not a procedure is done*
  - Will likely have complex symptoms to managed
  - Will face ongoing complex decision-making
  - PC can help with:
    - Difficult conversations
    - Managing patient and family distress, including bereavement
References


ACS Cancer Research Program (CRP) Educational Series

Surgical Oncology for the General Surgeon
Thursday, February 11

How to Utilize Social Media to Create a Meaningful Impact in Your Practice
Thursday, February 25

Emerging Diagnostic and Treatment Opportunities for Neuroendocrine Tumors of the Gastrointestinal Tract
Thursday, March 11

https://www.facs.org/quality-programs/cancer/events/crp-webinars
Cancer Programs Webinar Series

- Better Data; Better Quality; Better Outcomes Webinar Series – 8 webinars
- NAPBC Best Practices Webinar Series: Quality in Action – 6 webinars
- NAPRC: Practical Tips, Pearls, and Advice from the Trenches – 1 webinar
- CAnswer Forum LIVE 2021 – 6 webinars

To view and register for the webinars go to: https://www.facs.org/quality-programs/cancer/events
Thank you for joining the webinar today!

- Please help us improve the webinar by completing the evaluation being sent after the webinar.

- CME, CE, and CNE instructions included in post webinar email.

- Webinar available through ACS learning management system – learning.facs.org