Post-Oncologic Surgery Care

What to Look For

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HOLLIS CANCER CENTER
LAKELAND, FL
Oncologic Surgery

- **Multidisciplinary management**
  - Medical oncologist and Radiation oncologist
  - Prospective vs Retrospective review at tumor board conference

- **Goals of surgery**
  - Diagnostic procedure
  - Curative intent
  - Palliative surgery

- **Patient communication and education**
  - Understanding disease process
  - Prognosis
  - Lifestyle changes
  - Genetics/Familial inheritable syndromes

- **Patient’s goals, experiences, and directives**
  - Tolerance of surgery
  - Nutritional state
  - Postoperative experiences

- **Therapies that impact surgical outcomes**
  - Early postoperative
  - Late postoperative

- **Clinical trial participation/research**
  - Novel therapies
  - Biotherapy, hormonal therapy
  - Access to clinical trials
  - Participation bias/genetic testing
Oncologic Surgery:
Goals of Surgery

- **Diagnostic procedures**
  - Punch biopsy on skin or visible tumor
    - Inflammatory breast cancer, fungating tumor at the skin, melanoma
  - US guided fine needle aspiration
    - Small pain, occasional small hematoma
  - Incisional biopsy
    - Pain, infection
  - Excisional biopsy
    - Pain, infection, potentially leaving positive margins
Oncologic Surgery: 
Goals of Surgery

- Curative intent
  - Surgical resection with intent to remove all disease
    - Metastectomy ???
  - Extent of local regional spread or invading another organ
  - Lymph node status
  - Perineural and Lymphovascular invasion status
  - Resection margin status
  - Functionality after extensive curative resection
  - Medically fit to tolerate surgery?
Oncologic Surgery: Goals of Surgery

Palliative surgery

- Obstructing tumor in face of metastatic disease
  - Resection, bypass, ileostomy, colostomy, PEG tube
- Infection and perforation of gastrointestinal tumor
- Stents in GI tract (small bowel and large bowel)
- Infection and necrosis of solid organ tumor
- Malignant effusions
  - Pleural, pericardial, ascites
Oncologic Surgery: Patient’s Experiences

- Pain at the surgery site
- Venous thromboembolism
  - 5-7x increased risk in cancer patients
  - Deep vein thrombosis
  - Pulmonary embolism (fatal in cancer patients at 3x risk)
  - Age > 85 = 10-fold higher incidence rate vs 45-65 year old

- Bleeding
  - Disseminated intravascular coagulopathy (7%)

- Damage to nearby tissues and organs

- Infections
  - Immunosuppression
  - Gut flora
Oncologic Surgery: Patient’s Experiences

- Arterial embolism
  - Cancer compression of arterioles
  - Thrombin production
  - VEGF production
  - Inhibition of fibrinolysis
  - Activation of Factor X to Xa

- Emotional distress
  - Concerns regarding function
  - Survivability
  - Disfigurement
  - Impact on relationships
Oncologic Surgery: Patient Experiences

- **Patient communication and education**
  - Disease site and stage of disease, tumor biology (BIOLOGY IS KING)
  - Molecular/genetic studies
  - Neoadjuvant therapy (chemotherapy/radiation therapy/immunotherapy)
  - Surgical expectations
  - Adjuvant therapy (chemotherapy/radiation therapy/immunotherapy)
  - Oncology navigation
  - Impact of genetic testing (prophylactic surgery vs surveillance)
    - Familial inheritable cancer syndrome
    - Customized screening protocol
  - Clinical trial
Oncologic Surgery:
Side Effects of Surgery

- **Pain**
  - Surgical wound pain
  - Coordination with anesthesiologist to minimize pain
    - Epidural catheter, TAP block, PCA
  - Location and duration of pain varies depending upon the extent of surgery
  - Use of narcotics, muscle relaxants, anxiolytics
  - Signs of infection
    - Abscess, necrotizing fasciitis, ischemia/necrosis
Oncologic Surgery: Side Effects of Surgery

- **Fatigue**
  - Very common after surgery
  - Most commonly occurs when surgery takes place on the chest or abdomen
  - Side effect of anesthesia
  - Lack of energy (low fitness level)
  - Loss of appetite after surgery
  - Stress of surgery
Oncologic Surgery:
Side Effects of Surgery

- Appetite loss
  - Early satiety
  - Poor appetite
  - Change in sense of smell and taste
  - Associated with some weight loss and occasionally dehydration
  - Modification of food intake
  - Vitamin and mineral deficiency
  - Occasional need for supplemental nutrition
  - Dobhoff tube, percutaneous endoscopic gastrostomy tube, jejunostomy tube
Oncologic Surgery:
Side Effects of Surgery

- Problems with other body parts
  - Potential for organ dysfunction
  - Prolonged ileus
  - Nausea and vomiting/stomach cramps
  - Constipation
  - Liver dysfunction
  - Renal dysfunction
  - Pneumonia
  - Cardiac strain or myocardial infarction
  - Stroke
Oncologic Surgery:
Side Effects of Surgery

- **Common side effects at the surgery site**
  - **Swelling:** surgical site swelling as result of inflammation
  - **Drainage:** fluid buildup at the surgical site in the form of a seroma, hematoma, or lymphocele; possible fat necrosis
  - **Infection:** May occur at the surgical site or at a distant location
    - Erythema, warmth, increased pain, purulent drainage
    - Fibrinous exudate vs purulent exudate
    - Necrotizing fasciitis
    - Abscess formation
  - **Interventions include:** IV or oral antibiotics, incision and drainage, pigtail catheter drainage, chest tube, wound vats
Oncologic Surgery:

Issues specific to cancer patients after surgery

- Major surgery, patients have **increased risk** for:
  - DVT and pulmonary embolism
  - Anastomotic leaks (enteroenterostomy, enterocolostomy, biliary leak, pancreatic leak)
  - Fistulas (enterocutaneous, colocutaneous)
  - Abdominal wall fascial dehiscence
  - Lymphedema after lymphadenectomy (breast and melanoma)
  - Paresthesia (tingling sensation, numbness)
  - Chronic pain (neuroma)
  - Organ injury during extensive surgery: ureters, bladder, spleen, gallbladder
  - GI tract dysfunction (nausea/vomiting, diarrhea, constipation)
Oncologic Surgery: A Trigger for Metastases

Surgery:
- Induces increased shedding of cancer cells into circulation
- Suppression of anti-tumor immunity allowing circulating cells to survive
  - MDSC = myeloid-derived suppressor cells, immature myeloid cells with ability to suppress immune responses
- Upregulation of adhesion molecules in target tissues and in cancer cells
  - Enhances migration and invasion at a target site
- Induction of local and systemic inflammatory responses
  - Accelerated growth of residual and micro-metastatic disease

Perioperative factors:
- Anesthesia, transfusions, hypothermia

# Oncologic Surgery:
## Risk Factors for Surgical Site Infections

<table>
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<tr>
<th>Patient related</th>
<th>Local features</th>
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<td>- Peripheral vascular disease and smoking</td>
<td>- Long (prolonged) surgical procedure</td>
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<tr>
<td>- Anemia</td>
<td>- Oxygenation is poor (hypoxia)</td>
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<td>- Trauma</td>
<td>- Contamination of instruments and poor skin preparation</td>
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<td>- Immunosuppression including diabetes</td>
<td>- Antibiotic prophylaxis is inadequate</td>
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<td>- Elderly (old age)</td>
<td>- Local tissue necrosis and low temperature (hypothermia)</td>
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<td>- Nutritional: Malnutrition</td>
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<td>- Too much obesity</td>
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<td>- Stress</td>
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Neoadjuvant chemotherapy effect on tumors:

- **Complete** pathologic response
  - Breast cancer
  - Pancreas cancer
  - Esophageal and Gastric cancer
  - Colorectal cancer
  - Sarcoma/GIST
  - Ovarian cancer
  - Lung cancer
  - Melanoma
- **Partial** pathologic response (reduced size by >30%)
- **Stable** disease
- **Progressive** disease (tumor size increase by 20% or new metastases)

Role of Immunocheckpoint inhibitors

- Challenges with resistance to ICIs
Oncologic Surgery: Therapies that Impact Surgical Outcomes

- **Alkylating agents:**
  - Non-specific cell cycle inhibitor of DNA replication
  - Miscoding
  - Crosslinking

- **Side effects:**
  - Mucositis, stomatitis, esophagitis
  - Diarrhea, fatigue, nausea, vomiting
  - Loss of appetite, joint/muscle back pain

- **Antimetabolites:**
  - Cell specific S-cycle
  - Structurally similar to structures in the cell
  - Interfere with availability of normal purine or pyrimidine nucleotide precursors

- **Side effects:**
  - Nausea, vomiting, or loss of appetite, fatigue, sore muscles, headache and dizziness, diarrhea or constipation
  - Inflammation of the mouth and lips.
  - Higher levels of liver enzymes, which can be a sign of inflamed or injured liver cells.
  - Hair loss, rash or dry and cracked skin.
Oncologic Surgery:
Therapies that Impact Surgical Outcomes

- **Anti-tumor antibiotics:**
  - They function as cell-cycle-nonspecific DNA intercalating agents, interfering with DNA and RNA synthesis
  - Interfere with cancer cell copying their genome

- **Side effects:**
  - Tingling, nausea, vomiting, nerve pain, abdominal pain, diarrhea, fever, hair loss, and skin rashes.

- **Topoisomerase inhibitors:**
  - Type I enzymes cleave one DNA strand and pass either one or two DNA strands through the break before resealing it
  - Type II molecules cleave both DNA strands in concert and pass another double strand through the break followed by re-ligation of the double strand break

- **Side effects:**
  - Fatigue, gastrointestinal problems like diarrhea, hair loss, anemia, and increased risk of infection
  - Cardiotoxicity
  - Secondary malignancies
Mitotic inhibitors:
- Interfere with the assembly and disassembly of tubulin into microtubule polymers
- Interrupts cell division, usually during the mitosis (M) phase of the cell cycle

Side effects:
- Bone marrow depression, nausea and vomiting, mucositis, and diarrhea
- Cardiotoxicity
Case 1: 45M with progressive growth of a pimple on left arm for 8 months

- No history of trauma
- No history of skin cancer
- No exposure to toxic chemicals or radiation
- Landscape and tree cutter
- Tobacco smoker
**Case 1:** 45M with progressive growth of a pimple on left arm for 6 months

- **CT scan of left arm**
- **MRI of left arm**
- **CT scan of chest:** No evidence of pulmonary nodules
Case 1: 45M with progressive growth of a pimple on left arm for 8 months

Surgical resection with SLNBx at left axilla

STSG to left arm wound
After confirming neg margins

PATHOLOGY: Malignant pilomatrixoma (16 cm x 14 cm x 8 cm)
**Case 2:** 35M with history of left-sided abdominal pain, hematochezia

- Seen at another hospital, identified with long, high-grade partially obstructing *descending colon signet-ring cell adenocarcinoma*
- Consulting gastroenterologist placed colonic stent
- Details on primary surgeon’s input was not available
- Staging workup reveals **bone metastasis**
- Family history of colon cancer (father)

- **Started on chemotherapy:**
  - *mFOLFOX6 + MVASI* (bevacizumab- awwb) 5mg/kg IV
  - Oxaliplatin 85mg/m² IV
  - Leucovorin 400mg/m² IV
  - Fluorouracil IVP 400mg/m² & 2400mg/m² (1200mg/m² 2 x2d) CI q 14d x 12 Cycles
Case 2: 35M with history of left-sided abdominal pain, hematochezia

- Presents to OHH ER with sudden onset of increased abdominal pain
- On-call surgical consultant requested on day of admission
- Suboptimal discussion and multidisciplinary communication breakdown (chemotherapy???)
Case 2: 35M with history of left-sided abdominal pain, hematochezia

- HD 7, surgical oncology consultation requested for second opinion on a Friday, late afternoon
- Peritonitis, septic shock
- Access to information!!
- Rumored that efforts were being made to transfer to Tampa General Hosp
Case 2: 35M with history of left-sided abdominal pain, hematochezia

- IVFs, IV antibiotics, IV antifungal therapy, NG tube, central line, A-line
- Exp lap with subtotal left colectomy after drainage of fecal peritonitis, colostomy and partial small bowel resection
- **PATHOLOGY:**
  - ypT4a, pN2b, M1 poorly differentiated adenocarcinoma, signet ring cell type with abundant mucin with perforation at mid-descending colon
  - Extensive Lymphovascular invasion and perineural invasion
  - Negative margins, 9/12 LNs with metastatic disease
  - Tumor bud: HIGH (> 10)
  - MMR status: MLH1 and PMS2 intact; **MSH2 and MSH6 absent**
- **Complication:** anastomotic leak at the small bowel anastomosis POD 8, sepsis, hospice
Case 3: 53F with left-sided abdominal pain associated with intermittent nausea, vomiting and hematochezia

- Cuban native, sponsored by her family
- Intermittent constipation and abdominal bloating since Autumn 2022
- 20 lb. weight loss
- Sought medical attention, presented to ER at another hospital
- Work-up: CT scan of abdomen and pelvis reveals descending colon mass and colonoscopy with biopsy reveals poorly differentiated adenocarcinoma with high-grade stricture
- Surgical attempt to remove colon cancer “frozen abdomen and cannot remove it”... “diverting loop colostomy” sent to medical oncologist
- Developed DVT and IVC filter placed
Case 3: 53F with left-sided abdominal pain associated with intermittent nausea, vomiting and hematochezia
**Case 3:** 53F with left-sided abdominal pain associated with intermittent nausea, vomiting and hematochezia

- Referred for second opinion after admission to Oak Hill Hospital for persistent left sided abdominal pain, radiating to her back
- Family history of cancer:
  - prostate cancer (father, paternal grandfather)
  - uterine cancer (maternal grandmother, cousin)
  - breast cancer (maternal aunt, paternal aunt)
**Case 3:** 53F with left-sided abdominal pain associated with intermittent nausea, vomiting and hematochezia

- Exploratory laparotomy with takedown of loop colostomy, left hemicolecction with en-bloc resection of proximal jejunum, duodenojejunostomy and colocolostomy

- **PATHOLOGY:**
  - Poorly differentiated adenocarcinoma of descending colon
  - Tumor size: 10 cm, circumferential, no LVI or PNI
  - pT4b, pNo, M0 with 0/29 LNs, negative margins
  - Direct involvement of the small intestine
  - Tumor bud score: HIGH (> 10)

- **MMR status:**
  - MLH1 and PMS2 intact
  - MSH2 and MSH6 absent
Case 3: 53F with left-sided abdominal pain associated with intermittent nausea, vomiting and hematochezia

UGI swallow study with small bowel series on POD 20

Tolerating adjuvant chemotherapy
ICI is on hold
Thank you

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