Endoscopic Management of Gastrointestinal Cancer

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OBJECTIVES

- Describe various aspects of evaluation and management of patients with GI Cancer
- Discuss algorithmic approach to diagnosis, staging and treatment of GI cancer
- Discuss role of endoscopy in GI cancer
- Describe impact of curative and palliative endoscopic interventions in GI Cancer

Care of the GI Cancer Patient: The Endoscopist’s Partners

- Colorectal Surgery
- Interventional Radiology
- Medical Oncology
- Minimally Invasive Surgery
- Surgical Oncology
- Palliative Care
- Thoracic/Foregut Surgery
- Radiation Oncology
- Hepatobiliary Surgery, Hepatology, Liver Transplant
- Interventional Endoscopy
- Patient Family
Endoscopy & GI Cancer: Interface

- Tissue Diagnosis & staging of tumor
- Endoscopic Interventions: Curative intent
- Palliative Endoscopic Interventions

Multidisciplinary Cancer Care Algorithm

- Tissue/Biopsy (EUS, CT, Surgical)
- Staging
- Imaging (CT C/A/P)
- Multidisciplinary Approach (Tumor Board)

Interventional Endoscopy
- Fiducial placement
- Celiac plexus neurolysis
- ERCP with stenting
- Enteral stenting

Multidisciplinary Approach
- Surgical Oncology
- Medical and Radiation Oncology
- Palliative Care

Interventional Endoscopy Services in GI Cancer Domain

- Esophageal Endotheraphy
- Endoscopic Resection
- Radiofrequency Ablation
- Endoscopic Cryablation
- Endoscopic Stents
- ETTS
- Deep Enteroscopy
- Double Balloon Enteroscopy
- Spiral Enteroscopy
- Push Enteroscopy
- Enteroscopy
- Large Colon Polyps
- Colon/rectal
- Rectal Cancer EUS
- Rectal Carcinoid
- Removal

Therapeutic ERCP
- Cholangiopy
- Pancreatoscopy
- Radio ERCP
- Bi/L Metal Stents Hilar
- Cholangiocarcinoma
- Tissue sampling
- Palliation of Jaundice
- RFA of biliary tumors

Special Programs
- Endoscopic Mediastinoscopy
- Endoscopic EUS
- Pancreatic Cancer
- Hepatobiliary Oncology

Interventional EUS
- FNA & Core Biopsy
- Mediastinal Sampling
- Adenoma Sampling
- Celiac Neurolysis/Block
- Liver Mass Sampling
- Neuroendocrine Tumors
- Lymphoma Sampling
- Tumor Restaging
- Fiducial Placement
- BILIARY DRAINAGE

New Technology
- Confocal Endomicroscopy
- “Third Eye” Retroscope
- Video Choledochoscopes
- VLE
Advanced Imaging Platforms In Endoscopy

- HD-WLE: Hi Definition White Light Endoscopy
- NBI: Narrow Band Imaging
- FICE: Fujinon Intelligent Chromoendoscopy
- AFI: Autofluorescence Imaging
- eCLE: Endoscope based Confocal Laser Endomicroscopy
- pCLE: Probe based Confocal Laser Endomicroscopy
- OCT: Optical Coherence Tomography
- VLE: Volumetric Laser Endomicroscopy
- ETMI: Endoscopic Trimodal Imaging
- HRME: Hi Resolution Microendoscopy

Tissue Diagnosis

What is the commonest example of an endoscopic procedure that achieves tissue diagnosis of cancer?

Answer: Colonoscopy with biopsy of a colonic mass.

Tissue Diagnosis

- Accurate tissue diagnosis is key in Oncology
  - Inaccurate diagnosis disastrous!
- Accurate diagnosis critical for “personalized” cancer care
  - Cytologic staining, molecular cytogenetics etc
- A “Pancreatic Mass” could be:
  - Adenocarcinoma
  - Lymphoma
  - Neuroendocrine tumor
  - Or Autoimmune Pancreatitis!!
Tissue Diagnosis

- **Endoscopic approach to tissue diagnosis:**
  - Minimally invasive
  - Cost effective
  - Efficient
  - Low risk
  - Widely prevalent
  - Expedient
  - Accurate

Endoscopic Tissue Acquisition Modalities

- Colonoscopy & Upper Endoscopy with Biopsies
  - Slim caliber scopes
  - Double balloon scopes
- ERCP with brush cytology & intraductal biopsy
  - Cholangioscopy
- EUS-FNA of a variety of masses & target lesions
  - Fine Needle Aspiration (FNA)
  - Fine Needle Biopsy (FNB)

EUS & ERCP: Tissue Acquisition

- Mediastinum
- Subepithelial GI Tract lesions (e.g., GIST)
- Pancreas
- Biliary tree
- Lymph Nodes
- Perirectal & Pelvic Lesions
- Renal Lesions
- Adrenal lesions
- Liver
EUS Guided FNA for Pancreatic Tumors

- Sensitivity = 90%
- Specificity = 100%
- Accuracy = 94%
- For lesions as small as sub-cm
- Yield is enhanced with on-site cytopathologist
- FNA primary tumor, LNs, & liver lesions


EUS STAGING OF GI CANCER
T & N Stage
Vascular Invasion

- Esophageal Cancer
- Pancreatic Cancer
- Rectal Cancer
- Gastric Cancer

Management of GI Cancers
Curative Intent
Endoscopic Treatment of GI Cancer
Curative Intent

- Resection (removal) of tumor
  - EMR (mucosal resection)
  - ESD (submucosal dissection)
  - EFTR (full thickness resection)

- Ablation (destruction) of tumor
  - Lasers
  - Cryoablation (freezing)

Endoscopic Resection of Luminal GI Cancer

- Early Esophageal Cancer
- Early Gastric Cancer
- Foregut Carcinoid lesions
- Ampullary neoplasia
- Rectal Carcinoids
- Pedunculated colon polyps with carcinoma

Endoscopic Cancer Resection Caveats!

- Tumor should be superficial (limited to mucosa)
- Not poorly differentiated
- No lymphatic invasion on pathology
- No vascular invasion
- Deep margin should be clear
- Post-resection surveillance mandatory
- Multidisciplinary review recommended (Tumor Board)
Endoscopic Therapy of Dysplastic Barrett’s & Early Esophageal Cancer

- HGD (high grade dysplasia), CIS (carcinoma in-situ) & Early (T1a) carcinoma:
  - Conventionally treated like invasive adenocarcinoma
  - So far Standard of care has been “esophagectomy”
  - Paradigm shifted to endoscopic resection and ablation
    - EMR, ESD
    - RFA
    - CRYOTHERAPY
    - MULTIMODAL THERAPY

Endoscopic vs Surgical resection of T1 Esophageal Cancer: Similar Survival

Management of GI Cancers Palliative Intent
Endoscopic Management of GI Cancer: Palliative Intent

- Treating obstructive jaundice (ERCP/stent)
- Relief of dysphagia (Esophageal stent)
- Treating duodenal or colonic obstruction (Stents)
- Ablating tumor (Cryo/Laser)
- Pain relief (EUS Celiac Neurolysis)
- Other interventions (bleeding control, fiducials)

ERCP: Palliation of Jaundice

- ERCP with biliary stent placement
  - Most efficient intervention for obstructive jaundice
  - Plastic or metal stents
  - Cholangiocarcinoma
  - Pancreatic cancer
  - Metastatic cancer to liver/biliary tree
- EUS guided ERCP can now be done in difficult cases

Palliation of Jaundice

If ERCP fails, is there an alternative to PTC or surgical drainage?

EUS Guided ERCP!
Management of GI Luminal Obstruction

Enteral Stenting
(Placement of Permanent, Metal Stents in GI Lumen to Palliate Obstruction In Gastrointestinal Malignancy)

- Esophageal Stenting
- Gastric Outlet Obstruction
- Duodenal Obstruction
- Colonic Obstruction

Dysphagia Palliation
Esophageal Cancer

- Esophageal Stenting
- Endoscopic Cryoablation
- PDT
- Laser
Patients with pancreatic cancer and chronic pancreatitis often have severe debilitating pain. Pain is mediated through neurons in the celiac plexus. Injection of medications into this nerve plexus can provide pain relief. Traditionally, this has been performed under CT guidance. EUS guided approach is now standard.
EUS-Guided Celiac Plexus Block or Neurolysis

- Celiac Plexus Block – injection of steroids (triamcinolone)/long acting anesthetic (bupivacaine)
- Celiac Neurolysis – injection of ethanol/bupivacaine
- EUS allows real time imaging and visualization of celiac ganglion & vascular structures

Pain score reduction in 78% of patients
Mean pain score decreased by 50%

EUS-guided Celiac Plexus Neurolysis for Cancer

- 58 patients with pancreatic cancer
- Follow-up 6 mo

Gold fiducial placement for Cyberknife frameless radiation

- Traditionally placed by CT or surgery
- With advent of EUS fiducials can be easily and safely placed in:
  - Pancreas
  - Celiac nodes
  - Adrenal glands
  - Mediastinum
EUS-Guided Fiducial Placement

<table>
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<tr>
<th>Author</th>
<th>Year</th>
<th>N</th>
<th>Needle gauge</th>
<th>Site of cancer</th>
<th>Success</th>
<th>Complications</th>
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<tr>
<td>C.J. DiMaio</td>
<td>2009</td>
<td>30</td>
<td>22</td>
<td>Multiple</td>
<td>29 (97%)</td>
<td>Fever + LFT abnormalities</td>
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<tr>
<td>T. Ammar</td>
<td>2010</td>
<td>13</td>
<td>22</td>
<td>Multiple</td>
<td></td>
<td>None</td>
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<tr>
<td>S. Varadarajulu</td>
<td>2010</td>
<td>9</td>
<td>19</td>
<td>Pancreas</td>
<td>100</td>
<td>None</td>
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<tr>
<td>M. Sanders</td>
<td>2010</td>
<td>51</td>
<td>19</td>
<td>Pancreas</td>
<td>46 (90%)</td>
<td>Migration - 7% Pancreatitis - 2%</td>
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<tr>
<td>W. Park</td>
<td>2012</td>
<td>53</td>
<td>19</td>
<td>Pancreas</td>
<td>50 (94%)</td>
<td>Needle malfunction - 2% Bleeding - 1%</td>
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Interventional EUS: Future Interventions in GI Cancer

- EUS-FNI (Fine Needle Injection)
  - Chemo, Vectors
- EUS-Guided RFA
  - Pancreatic, Liver, other solid organs
- EUS-Guided Cytobrush Cytology
- EUS-Guided Endomicroscopy (nCLE)
  - Diagnosis of cancerous pancreatic cysts
  - Diagnose indeterminate solid lesions
Summary

- Interventional Endoscopy has a key role in the care of the GI Cancer patient
- Tissue diagnosis to palliation
- Multidisciplinary management is critical
- Significant advantage in era of health care reform (reduced cost/morbidity/LOS)
- Minimally invasive therapeutic endoscopy options continue to develop for Oncologic care