Upper Gastrointestinal Endoscopy

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Background

- Flexible endoscope originally developed in 1957
- Dominant modality for the Dx of GI disease
- Endoscopic surgery – mucosal ablation, resection, tissue approximation
- NOTES
Basic Upper Endoscopy
Indications
- Weight loss
- Early satiety
- Hematemesis, iron deficient anemia
- Dysphagia, odynophagia
- Persistent epigastric pain or heartburn

Contraindications
- Patient co-morbidity
- Inability to tolerate conscious sedation
Technique

- Performed under conscious sedation
- Monitoring blood pressure and $O_2$ sats
- Scope advanced gently under direct vision while insufflating
Potential Complications

- Performance-related
- Perforation – scope tip, elbow trauma or barotrauma
- Bleeding
- Infection
Potential Complications

- Medication-related
- Cardiac – arrhythmias and hypotension
- Pulmonary – airway compromise and aspiration
- Cetacaine
Therapeutic Interventions
Tissue Sampling

- Spiked forceps
- Multiple biopsies - ulcers
- Superficial vs deep biopsy
- Brush cytology
Bleeding

- Direct role in the evaluation and tx of UGIB
- Both a diagnostic and therapeutic potential
- Multiple endoscopic options for hemostasis
  - Thermal and non-thermal
  - Combination (coagulation, clipping ± coagulation)
Tissue coagulation

Collagen contraction

Vessel shrinkage

Types of thermal energy tools
  - Contact
  - Non-contact
Contact Thermal Tools

- Contact or coaptive techniques involve the use of probes passed via biopsy channel.
- Allows for pressure tamponade of the bleeding point.
- Simultaneous application of thermal energy for coagulation.
Noncontact Thermal Tools

- Involves delivery of energy to mucosal surface without direct contact
- Argon plasma coagulation
- Energy is actually sprayed
- Well suited for cases where large mucosal areas require treatment
Nonthermal Hemostatic Tools
Injection Sclerotherapy

- Delivery of hemostatic agents is performed by passage of a needle catheter system
- Agent is injected submucosally at 3 or 4 sites surrounding the bleeding point
- Works via direct tamponade and vasoconstriction
Banding

- Rubber band ligation

- Target is suctioned into the tip of the scope and then ligated

- Dieulafoy ulcers, esophageal and gastric varices
Other Options

- Clips
- Loops

- Can be used at multiple sites within GI tract in conjunction with other techniques
Dilation

- Can be performed for any enteral stricture that can be reached

- Stenoses and anastomotic strictures

- Use of fluoroscopy as an adjunct is believed to reduce risk of perforation
Dilation

- Long complex strictures may be less responsive
- Can require repeat treatments
- Aggressive biopsying after dilation
- Bleeding, perforation, mucosal tears and recurrent strictures
Dilation

- Common types
  - Guide wire driven – applies axial and radial force
  - Balloon – radial force
Adjunct

- Fluoroscopy
  - Ensures positioning of the device within the lumen
  - By injecting contrast to dilate the balloon, full expansion can be appreciated
Stents

- Used for treatment of strictures, leaks, fistulae, obstructing neoplasms

- Delivery system depends on stent type and location for deployment
Types

• Through-the-scope
  - Delivered through the endoscope channel

• Wire-guided
  - Limited to the esophagus, GE junction or rectosigmoid junction
  - Can be used following esophagojejunalostomy
Types

- Covered
  - Temporarily bridge leaks and fistuile
  - Removable
  - Prone to migration

- Uncovered
  - Temporary relief from benign or malignant strictures
  - Less migration
PEG

- Used since 1980 for access to GI tract for feeding or decompression

- Indications
  - Severe neurologic impairment
  - Oropharyngeal tumors
  - Facial trauma
Technical Pearls

- PEG should be placed in LUQ - 2 fingerbreaths below costal margin and medial to midline

- Transilluminate

- Generous skin incision
Complications

- Local wound infection
  - Most common
  - Minimize excessive tension on bolster
  - Treated with drainage + wound care
- Progressive enlargement of the tract
- Separation of the gastric and abdominal walls with leakage
- Gastrocolic fistula
  - Severe diarrhea after feeding
Other Options

- Intolerant of gastric feedings
- PEG + jejunostomy tube extension
- Direct percutaneous endoscopic J tube
- Lower incidence of aspiration, increased procedural risks (bleeding, perforation, leakage)
ERCP
ERCP

• Provides images of the pancreatic and biliary trees and access for therapy

• Sphincterotomy, removal of CBD stones, dilation of biliary strictures, stent placement and drainage of pseudocysts
Complications

• Perforation
  – Extension or tearing of the papilla beyond the junction of the CBD with duodenal wall

• Bleeding
  – At the time of procedure or in a delayed fashion (1 to 2 weeks later)

• Pancreatitis
  – Most common
  – Related to contrast injection
Additional Procedures
Endoscopic Mucosal Resection

- Treatment of premalignant and superficial cancers
- Employed for adenomas, dysplastic lesions and early-stage carcinomas
- Multiple technical variations
Endoscopic Ultrasound
EUS

- Introduced in 1980s
- Can accurately diagnose cancer
- FNA, LN sampling and drainage of pseudocysts
- One of the best modalities for evaluation and detection of pancreatic tumors – 95% sensitivity
Sensitivity is rooted in its ability to delineate the various layers of the GI tract

Can identify submucosa and differentiate between intramural and extrinsic masses

Characteristic patterns and readily learned and rapidly recognized

Established criteria for differentiating benign from malignant lesions
Future Directions
Future of Endoscopy

• Based on advancements of both tools and applications available to endoluminal therapy

• Intraluminal and transluminal endoscopic techniques – potential surgical options

• NOTES
• Access the abdominal cavity through naturally-existing orifices

• May not require a sterile working environment

• Could be done under conscious sedation