**Gastrointestinal Surgical Disease**

**Esophagus**: No serosa: easily injured, doesn’t heal well, cancer spreads easily

**Complications of surgery**: Index of suspicion of unable to belch or vomit
  - Prognosis: 90% relieved, 1% mortality

**Achalasia**: Dysphagia of liquids, then solids (vs. tumor). **Treatment**: surgery (Heller myotomy), 95% relief

**Diverticuli**
  - Zenker’s (false): between thyropharyngeus/cricopharyngeus muscles  **Treatment**: myomectomy
  - Middle: NOT a pulsion diverticulum. Traction due to scarring from mediastinal inflammation (saroid, histo)
  - Epiphrenic (distal): Pulsion related to reflux  **Treatment**: myomectomy

**Tumors**: 85% squamous worldwide
  - Nutrition risk factors: decreased vitamin C, retinol, riboflavin, increased nitrosamines in fungus-infected food
  - Other risk factors: alcohol (9g/day), tobacco (20cig/day), Barrett’s (10% risk), caustic injury
  - Tylosis: audosomal dominant. Hyperkeratosis of palms. 95% risk of esophageal cancer
  - **Symptoms**: Dysphagia (solids, then liquids), odynophagia, hoarseness, recurrent aspiration pneumonia
  - **Diagnosis**: “shelf,” “apple core” on barium swallow. CT for staging
  - **Treatment**: Upper 1/3: Aimed at palliation (swallow) since such poor prognosis
    - Middle: esophagectomy & bypass  Lower 1/3: resection and end-to-end anastomosis
  - **Prognosis**: Cure rate: 20%

**Trauma**: Perforation, usually instrumentation (EGD, NGT, tamponade balloon), spontaneous (Boerhaave)

**Caustic Ingestion**: worst is alkaline. **Treatment**: NPO, IV antibiotics, steroids, Barium swallow in 4-6 weeks

**Obesity**

**Physiology**: Ghrelin (gastric) acts on anterolateral nucleus of hypothalamus

**Surgical indications**: BMI 35-40 + comorbidities or BMI > 40
  - Comorbidities: sleep apnea, degenerative joint disease, GERD, urinary stress incontinence, hypertension, infertility (PCOS), psychosocial

**Treatment**
  - **Behavior modification** - indicated for BMI < 27
    - Low calorie diet. 1200-1500 for men. lose 1-2 lb/week
    - Increased energy expenditure is less effective
  - **Pharmacotherapy** - indicated for BMI 27-30
    - Sibutramine (serotonin, NE reuptake inhibitor). Side effects: headache, insomnia
    - Orlistate (lipase inhibitor). Side effects: steatorrhea
  - **Surgery**: Must have BMI, failed nonoperative, and have adequate psychological state to assure compliance
    - Restrictive: Vertical band gastroplasty, adjustable gastric banding: **Loss of 45% EBW** (excess body wt)
    - Malabsorption: Biliopancreateing diversion (BPD): **Loss of 70-90% EBW**
    - Combined: Roux-en-Y gastric bypass (most common) **Loss of 75-85% EBW**
  - **Complications**
    - Anastomotic leak, DVT/PE, stricture, nutritional problems (esp B12 def), erosion of band (1%)
    - Cholelithiasis in 1/3 (do cholecystectomy or ursodexyherolic acid treatment)
Stomach & Duodenum

Anatomy: LES: 2 cm long and 6 mmHg in healthy
- **Pylorus**: 1-3 cm long. Prevents duodenal reflux, prevents forward passage of particles >3-5mm
- **Fundus**: Location of gastric pacemaker
- **Corpus**: most of parietal cells, chief cells, ECLs
- **Antrum**: G cells. *Distinguished by lack of parietal cells here (stain with eosin)*
- **Vagus**: Left vagus: Anterior nerve of Laterjet, hepatic branch
  Right vagus: Posterior n. of Laterjet, celiac, occasionally Criminal n. of Grassi (hard to ligate)

Physiology: Parietal cell receptors: CCKB, Gastrin, M3, H2 - all act to secrete acid. Can all be inhibited.

Peptic Ulcer Disease

Types: *I - lesser curvature, II - lesser & duodenal, III - prepyloric, IV - near GEJ*
- Types II and III are hypersecretory - need vagotomy

Symptoms: Pain radiating to the back, *made better with food in duodenal, made worse with food in gastric*

Risk factors: Tobacco, NSAIDs, prior PUD, H. pylori

Diagnosis: Endoscopy with multiple biopsies from edge.
- Empirical with H. pylori. Mandatory testing (ELISA, biopsy, stain (warthin-silver), urea breath test (CLO)

Treatment:
- Medical: stop tobacco, NSAID, steroid, alcohol
  - Treat H. pylori: Triple (PPI, flagyl, clarithromycin - 90%), Quadruple (PPI, flagyl, tetracycline, bismuth - 98%)
    - Bismuth: interferes with adhesion, urease, phospholipase, proteolysis
  - Repeat endoscopy in 6 weeks, if no substantial decrease in ulcer (>50% reduced), do another 6 weeks.
    - Not resolved: resection. Ulcer enlarged: resection AND vagotomy
- Surgery. Indications: *bleeding, perforation, gastric outlet obstruction, intractibility*
  - I, II, III: 50% gastrectomy
    - Billroth I (Duodenum -> stomach)
    - Billroth II (Stomach -> jejunum) (side anastomosis)
    - Roux-en-Y (Stomach -> jejunum, duodenum -> jejunum)
    - Highly-selective: only branches ligated. Leave Crow’s feet so antral pacemaker, sphincter intact.
    - Check serum gastrin to rule out Zollinger-Ellison
- Complications: Perforation, hemorrhage, gastric outlet obstruction
  - Perforation: peritonitis (rebound). Diagnosis: CXR, AXR (free air). Treatment: repair with omental (Graham) patch
    - If hypotensive, suspect sepsis. If it occurs while on medical therapy: indication for HSV/V&P later
  - Bleeding: Hematemesis, melena, bloody stool. Diagnosis: lavage, CBC, BMP, serial H&H, endoscopy
    - EGD. White clot: observe
      - Fresh clot: Epinephrine, sclerosing agent, thermal ablation, laser, suture (laparoscopically)
      - Clot with visible artery: operate in 24-48 hours. Rebleed risk is 40%.
    - If source is gastric (vs. duodenal), biopsy is mandatory to rule out gastric cancer.
    - Investigate systemic causes for bleeding (uremia plately dysfunction, coagulopathy)
  - Outlet obstruction: projectile vomiting like pyloric stenosis. Treatment: Fluids, correction of electrolytes
  - Intractibility: Suspect Zollinger-Ellison syndrome. Treatment: Vagotomy

Adenocarcinoma of the stomach: Intestinal (hematogenous spread), Diffuse (signet ring cells, blood type A)
- Symptoms: Early: asymptomatic, Late: epigastric pain, weight loss, dysphagia, hematemesis, nausea/vomiting
- Diagnosis: Endoscopy (good at detecting lymphatic spread), CT for staging
- Treatment: 85% gastrectomy - at least 6cm distal to lesion, Roux-en-Y anastomosis, radiation + chemo (maybe)

Adenocarcinoma of the duodenum: mostly periampullary. Treatment: Whipple procedure (Pancreatoduodenectomy)

Lymphoma 2/3 of GI lymphomas are in stomach. 75% 5-year survival
- Diagnosis: Whole body CT. Look in Waldeneyer’s ring.
- Treatment: Stage I + II: resection + chemotherapy. Stage III: chemo only. MALT responds to H. pylori eradication

GIST: Diagnosis: 10 mitoses per 50 fields. Treatment: excision to 2-3 cm margin
**Gastrinoma (Zollinger-Ellison Syndrome)**

- Gastrinoma Triangle: 1) Cystic duct/CBD, 2) 2nd/3rd duodenum, 3) Neck of pancreas
- 60% are malignant, but grow slowly
- **Diagnosis:** CT/MRI to locate
  - Fasting gastrin level (with no PPIs x 1 wk): >1200pg is diagnostic.
  - Somatostatin (octeotride) receptor scan
  - Ca²⁺, secretin gastrin stimulation test
- **Treatment:** Screen for MEN syndromes (ex. Calcium level for PTH)
  - Sporadic: resection, definitely PPIs, vagotomy. Usually solitary: enucleation/Whipple depending on involvement
  - MEN-associated: Probably not resect because usually multifocal
    - Resect PTH adenoma because Ca²⁺ stimulates gastrin
  - Unresectable: chemotherapy (streptazosin)

**Insulinoma**

**Diagnosis:** Whipple triad: fastic glucose <60 mg/dl, symptomatic hypoglycemia, relief with glucose administration
- Rule out exogenous insulin with C-peptide level

**Treatment**
- Sporadic: Resect. 80% solitary.
- MEN-associated: often multicentric. Chemotherapy (diazoxide)

**Varices**

1. Band ligation
2. Correct coagulopathy
3. Pressor treatment (octeotride, vasopressin)
4. Repeat endoscopy/sclerotherapy if still bleeding
   - a. Portosystemic shunt (50% mortality)
   - b. Balloon tamponade
   - c. Transjugular Intrahepatic Portosystemic Shunt (TIPS)
5. If bleeding resolves: long-term B-blocker therapy, portosystemic shunt if healthy (lower risk of encephalopathy)

**Postgastrectomy Syndromes**

- **Early Dumping:** Onset 15 min postprandial: weakness, tachycardia, diaphoresis, palpitations, diarrhea
  - Due to hypertonic fluid (sugars) in the small intestine AND erratic hormone release (VIP, glucagon, his)
  - **Treatment:** Somatostatin and avoiding hypertonic foods. Better result with Roux-en-Y
- **Late dumping:** Onset 3 hours postprandial. Same symptoms as early dumping but no diarrhea or borborygmi
  - Due to large amt of sugar causing profound insulin release --> hypoglycemia
  - **Treatment:** snack 2 hours after meals to buoy glucose levels
- **Postvagotomy diarrhea:** seen in 50%, but usually disappears on its own
- **Afferent loop obstruction:** Billroth II only. Kink in the afferent loop of duodenum, secretions get trapped.
  - **Symptoms:** crushing pain postprandially. 45 minutes: rush, increased pain, vomiting dark brown
- **Blind loop syndrome:** More common after Billroth II than Roux-en-Y
  - Due to bacterial overgrowth in loop which is excluded from flow of chyme. **Symptoms:** B12 def, malabs.
  - **Treatment:** antibiotics
- **Alkaline reflux gastritis:** Distal contents reflux into the stomach. Weakness, weight loss, nausea, pain, anemia
  - **Diagnosis:** endoscopy: bile stained stomach, sciontography shows delayed gastric emptying
  - **Treatment:** Roux-en-Y conversion
- **Recurrent Ulcer:** Most commonly due to incomplete vagotomy (Criminal n. of Grassi). **Treatment:** PPI, reop
- **Gastric Atony:** 50% Roux-en-Y show delay, few are symptomatic
  - **Treatment:** Urechole, erythromicin (promotility)
Small Intestine

Anatomy
- Duodenum: bulb, descending (minor/major papilla), inferior, ascending. To Ligament of Treitz
- Jejunum: first 40% of segment distal to Ligament of Treitz. More plicae circularis, longer vasa recta.
- Ileum: Distal 60%. Contains Peyer’s patches. Ileocecal valve prevents reflux of bacteria.

Physiology: digestion, absorption, endocrine.
- Submucosal (Meissner’s) and Myenteric (Aurbach’s) plexuses
- Migrating motor complex (MMC): 1) Quiescent, 2) Accelerating, 3) Spikes, 4) Intermittent spike. 90-120min.
- Absorbs 80% of succus entericus (intestinal juice)

Meckel’s Diverticulum
- 2% of population, 2:1 Male to female, 2 types of mucosae, within 2 feet of ileocecal valve
- Incomplete obliteration of the vitelline duct (normally closes week 8-10). Antimesenteric side.
- 50% have gastric mucosa, sometimes pancreatic, colonic
- Often confused with acute appendicitis. Consider testing if normal appendix found in appendectomy.
- Symptoms: 95% asymptomatic. 5% with hemorrhage, ileus (volvulus), intussusception, diverticulitis, perforation
- Diagnosis: Technetium 99m pTc (90% sensitive)
- Treatment: Resection if adhered, heterotopic tissue present, has a hostile abdomen.

Crohn’s Disease
- Epidemiology: 70/100,000. IBD1 locus. Bimodal: twenties, seventies. Ileocecal involvement in 40-50%
- Pathology: Chronic, transmural, skip lesions, granulomas(60%). Extraintestinal (skin, eyes, mouth, joints, biliary)
  - Thought to be abnormal response to intracellular intestinal bacteria
- Symptoms: abdominal pain, diarrhea, weight loss. Bleeding is uncommon unlike Ulcerative Colitis.
  - Constitutional symptoms develop: fatigue, fever, weight loss, anorexia. Perianal fistulae.
  - Extraintestinal: uveitis, pyoderma gangrenosum, ankylosing spondylitis, sclerosing cholangitis.
  - Nutritional losses: hypoalbuminemia, fat-soluble vitamin deficiency, b12 deficiency
  - Nephrolithiasis. Fat malabsorption causes excess of oxalate causing oxalaturia.
- Treatment
  - Medical: Analgesics, antidiarrheal, anti-inflammatory (5-ASA, steroids), nutritional support, immunosuppressive (6-MP), probiotics.
  - Surgery: Complications and failed medical therapy.
    - Recurrence after surgery is 40% within 5 years, usually proximal to existing lesions.
    - Try to minimize resection knowing that you will likely reoperate. Need 100cm small int. for oral.
  - Complications: wound healing (medical), short bowel [malabsorption] syndrome (surgery)
    - Fistula not itself a reason for surgery: seton tube (progressive healing), flagyl
    - SBO: CT to rule out perforation

Benign Tumors
- GISTs: from interstitial cells of Cajal. c-kit protooncogene. No necrosis, metastasis. Formerly leiomyomas.
- Hemangiomas (Osler-Weber-Rendu. [AD]), hamartomas, lymphangiomas, neurogenic tumors
- Periampullary duodenal adenocarcinoma: most common malignancy in FAP patients after proctocolectomy.

Adenocarcinoma: 50% of small intestine malignancies. Occur most commonly proximal.
- Symptoms: obstruction with weight loss. Occult bleeding, anemia.

Carcinoid Tumors: Kulchitsky cells of crypts of Lieberkuhn. Amine precursor uptake and decarboxylation (APUD)
- 1 cm size delineates danger. Under this, only 2% metastasize. Over 2 cm, 90% metastasize.
- Symptoms: Obstruction most common! Not due to tumor, but induced desmoplastic reaction of mesentery.
  - Carcinoid syndrome: flushing, bronchospasm, cramping, diarrhea, vasomotor, pellagra, R heart failure
- Treatment: Resection

Lymphoma: most common site of extranodal lymphoma (5%). Mostly in ileum (Peyer’s patches). Mostly elderly.
- Symptoms: Usually nonspecific. 1/4 present abdominal emergencies (perforation, hemorrhage, obstruction.
- Diagnosis: CT showing nodularity and thickening of bowel wall with adenopathy
- Treatment: Resection, chemo and or radiation. 20-40% 5-year survival
SMALL BOWEL OBSTRUCTION

- Most common etiologies: hernia (worldwide), prior surgery (US) [90% get adhesions, 5% get SBO]
- Inflammatory etiologies: diverticulitis, cholecystitis, appendicitis, PID, endometriosis.
- Other etiologies: volvulus, intussusception, Crohn’s, gallstone ileus, SMA syndrome (compresses duodenum)
- Pathophysiology: Fluid deficit (3rd space in bowel wall, electrolyte imbalance), ischemic bowel
  - Risk factors for ischemic bowel: Fever, tachycardia, leukocytosis, local tenderness. (additive, all=67%)
  - Nonoperative management for more than 24-48 hours without resolution: high risk of ischemia.
- Symptoms: Nausea and vomiting (worse if proximal) - dehydration, distension (worse if distal), constipation, obstipation (varies based on location). Bowel sounds decrease to nil. Hypochloremic, hypokalemic alkalosis.
- Diagnosis: Abdominal series (supine and upright) - air/fluid levels, CXR. R/o renal/biliary calculi, pneumoperitoneum, pneumatosis intestinalis, pneumonia. Get CT if equivocal.
  - Plain films will show distended loops of bowel with lack of transition zone.
- Treatment: Resuscitation (volume, electrolytes), NG tube.
  - 80% those with prior-surgery adhesive SBO resolve with nonoperative treatment
  - High % without prior surgery fail nonoperative management, go to the OR after 24-48 hrs or deterioration
  - Exceptions: early postoperative SBOs get 2 weeks to resolve, hostile abdomen.
  - Surgery: Laparotomy (laparoscopy unproven). Antibiotics for gram negatives, doppler of arteries, resect.
- Complications: wound infection, anastomotic leak, abscess, peritonitis, fistula. Mortality 1%, 25% (ischemic)

LARGE BOWEL OBSTRUCTION

- Etiologies: Cancer (65%), diverticulitis scarring (20%), volvulus (5%), inflammatory disorders, benign tumors
- Symptoms:
  - Same as small bowel obstruction if ileocecal valve is incompetent (25%)
  - Competent (75%): get “closed loop” between valve and occluded segment
    - Massive colonic distention (12cm)
- Diagnosis: AXR, barium enema (never oral) if AXR positive.
- Treatment:
  - IVF, NGT. Neostigmine (contracts colon) if this fails.
  - Indications for surgery: distention >12cm, severe tenderness, peritonitis, sepsis
  - Ogilvie syndrome (ileus with no mechanic obstruction): fiberoptic colonoscopy
  - Volvulus: rectal stent tube for decompression
Hepatobiliary system

Painless Jaundice

- **Diagnosis:** Ultrasound (no stones present), CT, ERCP with brushings for cytology, endoscopic ultrasound
  - Ultrasound shows dilated intrahepatic ducts but normal CBD.

  - **Cholangiocarcinoma (Klatskin tumor)**
    - **Risk factors:** Tobacco use, recent weight loss
    - **Treatment:** Pancreaticoduodenectomy (Whipple). **Prognosis:** Terrible

- **Ampullary adenocarcinoma.** **Treatment:** Whipple. **Prognosis:** better (65% 5-year survival)

- **Pancreatic adenocarcinoma**
  - **Risk factors:** Tobacco use, recent weight loss
  - **Prognostic factors:** <3cm, -nodes, diploid, S-phase < 19%, - margins, postop chemo/rad.

- **Common bile duct stricture**
  - **Risk factors:** Alcholism, prior biliary surgery

- **Common bile duct stone @ ampulla**
  - Hard to see with abdominal ultrasound.

Gallbladder carcinoma. **Treatment:** opencholecystectomy, 2-3cm margin

Gallbladder polyp **Treatment:** Observe if < 2cm, cholecystectomy if > 2cm

Porecelain gallbladder **Treatment:** cholecystectomy

### Pancreatitis

#### Ranson Criteria:

<table>
<thead>
<tr>
<th>Admission</th>
<th>48 hours</th>
<th>Mortality by # of factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;55 years old</td>
<td>HCT decrease 10%</td>
<td>3: 28%</td>
</tr>
<tr>
<td>WBC &gt; 16k</td>
<td>BUN increase 5mg/dl</td>
<td></td>
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<tr>
<td>Glucose &gt; 200mg/dl</td>
<td>Ca2+ &lt; 8 mg/dl</td>
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<tr>
<td>LDH &gt; 350</td>
<td>PaO2 &lt; 60 mmHg</td>
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<tr>
<td>AST &gt; 250</td>
<td>Base deficit &gt; 4</td>
<td></td>
</tr>
<tr>
<td>HCT decrease 10%</td>
<td>Fluid sequst. &gt;6L</td>
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</tbody>
</table>

#### Complications:

- Abscess: I & D
- Sudden hypotension: angiography
- Pseudocyst (pain, anorexia): CT
  - Observe 6 weeks, cystogastrostomy

#### Admission

- >55 years old
- WBC > 16k
- Glucose > 200mg/dl
- LDH > 350
- AST > 250

#### 48 hours

- HCT decrease 10%
- BUN increase 5mg/dl
- Ca2+ < 8 mg/dl
- PaO2 < 60 mmHg
- Base deficit > 4
- Fluid sequst. >6L

#### Mortality by # of factors

- 3: 28%
- 5-6: 40%
- 7-8: 100%

### Hepatic Mass

**Diagnosis:** ultrasound. Cystic (symple cyst), noncystic (hemangioma, FNH, adenoma, HCC, metastasis)

- **Cystic**
  - Simple cyst: aspirate if symptomatic. Observe if asymptomatic
  - Multilocular cyst: echinococcal cyst. **Treatment:** hypertonic saline, excision
  - Abscess. **Treatment:** IV antibiotics, CT-guided drainage. Many small abscesses: IV antibiotics only.
  - Amebic abscess. **Diagnosis:** ELISA, ultrasound. **Treatment:** Metronidazole. no excision!

- **Solid**
  - Hemangioma. **Diagnosis:** radiolabeled RBC scan. **Treatment:** resect if symptomatic, risk of rupture, uncertain
  - Focal nodular hyperplasia. **Diagnosis:** CT scan shows central stellate scar. **Tx:** observe, biopsy to r/o cancer
  - Adenoma. **Treatment:** resect if risk of rupture (persistent, large, pregnant)
Large Intestine

Anatomy:
- Sigmoid (intraperitoneal) --> Rectum @ sacrum, becomes posteriorly retroperitoneal
- Rectum: 15 cm long. Tenia coli (longitudinal layer of muscularis) disperse @ sacral promontory
  - Top 5cm are anteriorly retroperitoneal, lower 10cm are completely retroperitoneal
- Anal canal: 3-4cm, from the dentate (pectinate) line --> anal verge
  - Dentate line: columnar (intestinal) epithelium --> squamous (anal) epithelium
  - Rectal columns of Morgagni: most common site of abscess.
- Blood supply
  - Splenic flexure is “watershed zone”
  - Rectum: superior hemorrhoidal (IMA), middle (Internal iliac), lower (internal pudendal -- int. iliac)

Physiology:
- 700ml chyme --> 200ml stool. 800-900ml flatus daily. Indole/skatole give odor.
- Normal frequency of defecation: 24 hours (8-72 hours)
- High number of bacteria: 25-30% infection rate of colon surgery that was not prepped first.

DIVERTICULOSIS
- 70% of elderly patients may have asymptomatic diverticulosis. Increases from 50s-80s.
- 80% an asymptomatic finding on barium enema.
- 95% occur in sigmoid colon. Usually occurs where branches of marginal artery penetrate the wall of the colon.
- Etiology: higher than normal intraluminal pressures as would occur with low fiber diet.
- Symptoms: 40% of lower GI bleeds. Most common cause of lower GI bleeds in < 60 years old.
  - 25% of bleeds are massive (requires 4+ units of blood in 24 hours to maintain hemodynamics)
  - Usually asymptomatic. Recurrent abdominal pain in LLQ, change in bowel habits. Bleeding.
  - Fever and leukocytosis MUST be absent.
- Treatment: Diet of increased fiber, psyllium.

DIVERTICULITIS
- Pathophysiology:
  - Limited infection of one or more diverticula, including extension into adjacent tissue.
  - Fecalith obstruction --> microperforation.
- Symptoms: LLQ pain (subacute onset), alteration in bowel habits (constipation OR diarrhea)
  - Lower GI bleeding rare (common in diverticulosis, not -itis)
  - Fever, LLQ pain, leukocytosis (“LLQ appendicitis”)
- Diagnosis/Workup
  - AXR, CT with oral and IV contrast.
  - Barium enema and colonoscopy are CONTRAINDICATED during acute phase (2-3 weeks) due to perforation risk, unless signs of obstructive or fistula symptoms.
- Treatment: Directed at specific complication.
  - Acute: medical treatment 85% of the time.
    - Admit, IVF, IV non-opioid analgesics, NPO, IV abx(aminoglycoside, coverage for B. fragilis) x 5-7 days.
  - Surgery: Resection
- Indications for surgery: Perforation, obstruction, intractability (recurrence), bleeding, fistula
  - All patients with diverticulitis must undergo a full colonoscopy 4-6 weeks after the attack to r/o malignancy
  - Procedure: sigmoid colectomy, temporary colostomy
- Complications
  - Fistula: skin, vagina, bladder (most common complication - 4%. Pneumaturia, recurrent UTI)
  - Perforation, abscess, fistula, obstruction

HEMORRHOIDS
- Classification:
  - 1: bulge in lumen Take bulking agent, increase water intake
  - 2: protrudes with defecation Band ligation
  - 3: manual reduction required
  - 4: incarcerated Surgical hemorrhoidectomy

PERIRECTAL ABSCESS: Starts by obstruction of glands of Morgagni. 70% are perianal or ischiorectal

ANAL FISSURE: Severe pain. Far worse than hemorrhoidal pain.
COLORECTAL ADENOCARCINOMA

- **Screening:**
  - Fecal occult blood testing annually after 50 years of age. 20% positive predictive value
  - Sigmoidoscopy at 50 and at 5 year intervals OR colonoscopy at 50 and at 10 year intervals

- **Presentation:**
  - Most common cause of bowel obstruction in an individual **without** prior abdominal surgeries (generally right sided cancers have worse prognosis due to late presentation (later obstruction vs. left-sided tumors))
  - Heme-positive stool (generally right-sided cancers)
  - Unexplained anemia in a male OR FEMALE over 40-50
  - History of inflammatory bowel disease (especially UC)
  - Family history of colon cancer, FAP, HNPCC, Peutz-Jeghers

- **Diagnosis:** Colonoscopy & biopsy
  - 50% of colon cancer occurs in the rectum, 20% sigmoid, 15% ascending

- **Treatment**
  - Hemicolecotomy + node dissection (50% involvement)
    - Stage I + II (any T, no nodes, no mets): Resection only
    - Stage III + IV (nodes or mets): Neoadjuvant and postoperative
  - Baseline CEA (to help detect recurrences)
  - Chest X-ray (to look for metastasis)
  - Liver function tests to look for metastasis - liver is the most common site - 20% at diagnosis. 0% 5-year surv.

- **Prognosis:** **most important variable is lymph node involvement**

- **Postoperative:** Colonoscopy or barium enema every 6 months. Bimonthly CEA level (70% predictive). PET, CXR, LFTs.

RECTAL SQUAMOUS CARCINOMA

- **Diagnosis:** transrectal ultrasound (wall invasion), CT (invasion of surrounding structures - prostate, bladder, ureter)
- **Staging:** same as with adenocarcinoma
- **Treatment:** <5cm from anal verge: can spread via inguinal lymphatics, margins include sphincter mechanism
  - Small tumor: small resection, larger tumor: NIGRO neoadjuvant therapy

ULCERATIVE COLITIS

- **Diagnosis:** Biopsy: stricture, polyloid lesion, mucosal plaques. Resect if severe dysplasia.
- **Treatment**
  - Medical (succeeds in 80%)
    - Mild: antidiarrheal, psyllium, sulfasalazine
    - Moderate: sulfasalazine (5-ASA) 50% have remission, but side effects
    - Severe: steroid, anti-TNF
  - Surgery: indicated when medical therapy fails, surgically-treatable complications arise, long-standing disease
    - Total proctocolectomy, ileal pouch, anastomosis to anus.
    - **Complications of surgery:** Pouchitis (hemorrhagic mucosa). **Treatment:** metronidazole only

- **Postoperative:** Cancer risk low for first 10 years. Colonoscopy every 1-2 years after 8 years
- **Complications:** Toxic megacolon, perforation, hemorrhage, carcinoma
  - **Diagnosis:** Abdominal obstructive series, CT with contrast
  - **Treatment:** Trial of medical therapy: NGT, NPO, TPN, IVF, Abx, **High dose IV steroids**
    - Indications for surgery (resection w/Hartman): no change in 3-5 days, perforation, pneumo-intestinalis
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