

## Upper GI: Esophagus and Stomach

## Dysphagia

- Etiology
  - Obstructions
    - Intrinsic: tumors, strictures, herniations
    - Extrinsic: tumors, ascites, morbid obesity
  - Achalasia: LES dysfunction
  - Functional dysphagia: Neural problems
- Clinical Manifestations
  - Discomfort with swallowing
  - Solids or liquids
  - Choking/aspiration

## Dysphagia

- Evaluation
  - History
  - Barium swallow
  - Manometry
  - Endoscopy
- Treatment
  - Behavioral
  - Dilatation/Surgery
  - Thickened diet

## Gastroesophageal Reflux Disease

- Etiology
  - LES relaxation
  - LES defects
  - Delayed gastric emptying
- Morphologic changes
  - Symptoms do not correlate to damage
  - No damage
  - Esophagitis
    - Sustained leads to Barret's esophagus
    - 10% of Barret's leads to esophageal cancer

## GERD

- Clinical Manifestations
  - Heartburn
  - Regurgitation
  - Chest pain
  - Cough, sinusitis
  - Risk factors
    - Obesity
    - Acidic foods, Foods that relax LES

## GERD

- Evaluation
  - Barium Swallow
  - pH study
  - Endoscopy
- Treatment
  - Lifestyle changes
  - Acid lowering drugs
  - Motility enhancing agents
  - Surgery

## Pyloric Obstruction

- Etiology
  - Congenital
  - Acquired
    - PUD
    - Duodenitis
    - Cancer
- Manifestations
  - Fullness
  - Pain/distension
  - Projectile vomiting

## Pyloric Obstruction

- Evaluation
  - Manifestations
  - Endoscopy
- Treatment
  - Gastric suction
  - Treat PUD
  - Surgery
  - TPN

## Gastritis

- Acute
  - Etiology
    - Helicobacter pylori
    - Drugs, esp NSAIDS
  - Manifestations
    - Vague abd pain
    - Tenderness Bleeding
  - Healing occurs spontaneously if conditions are removed
- Chronic
  - Usually in older adults
  - Thinning and degeneration of stomach lining
  - Immune
    - Destruction of chief and parietal cells
  - Non-immune types
    - H. pylori
    - Hot liquids

## Gastritis

- Manifestations
  - Vague
  - Discomfort with food
  - Bleeding
- Treatment
  - Underlying conditions
  - Diet
  - Antibiotics

## Peptic Ulcer Disease (PUD)

- Terminology
  - Superficial ulcers: erosions, no involvement of muscularis
  - True ulcers extend through muscularis; hemorrhage
- Etiology
  - NSAIDS
  - H. pylori
  - ETOH
  - Stress

## PUD

- Duodenal ulcers – most common
- Manifestations
  - Pain begins 30 min - 2 hours after eating
  - Stomach is empty
  - Food-pain-relief
  - Bleeding
  - Remission-exacerbation

## PUD

- Duodenal Ulcers
  - Evaluation
    - Barium swallow
    - Endoscopy
    - H. pylori detection
  - Treatment
    - lower acid
    - Treat H. pylori

## PUD

- Gastric ulcers
  - Similar to duodenal ulcers
  - Usually chronic
  - Often associated with chronic gastritis
  - Sometimes associated with
    - Anorexia
    - Vomiting
    - weightloss

## PUD

- Stress ulcers
  - Acute peptic ulcers associated with severe illness or systemic trauma
    - Ischemic ulcers: post hemorrhage, burns, heart failure, sepsis, ventilation
    - Curling ulcers: from burns
    - Cushing ulcer: head trauma, brain surgery
- Surgical treatment of Ulcers

## Post-Gastrectomy Syndrome

- Dumping syndrome
  - Sudden gastric emptying
  - Decrease in blood volume
  - Manage with diet
- Alkaline Reflux Gastritis
- Afferent loop obstruction
- Diarrhea
- Weightloss
- Anemia – Supplement

## Drugs for PUD, GERD

## PUD Risk Factors

- |                            |                            |
|----------------------------|----------------------------|
| • <u>Defensive factors</u> | • <u>Offensive factors</u> |
| • Mucus                    | • Helicobacter pylori      |
| • Bicarbonate              | • NSAIDS                   |
| • Blood flow               | • Gastric acid             |
| • Prostaglandins           | • Pepsin                   |
|                            | • Smoking                  |

## Overview of drug choices

- Antibacterials
- Antisecretory agents
  - H2 blockers
  - Proton Pump Inhibitors (PPIs)
- Mucosal protectants
  - Sucralfate
  - Misoprostol
- Antacids

## Antibacterials

- **H. pylori tests**
  - Breath test
  - Blood test
  - Stool test
  - Biopsy test
- **Antibiotics**
  - Bismuth
  - Clarithromycin
  - Amoxicillin
  - Tetracycline
  - Metronidazole

## H2 Blockers

- Cimetidine (Tagamet)
- Ranitidine (Zantac)
- Famotidine (Pepcid)
- Nizatidine (Axid)
- Mechanism of action
  - H2 histamine receptors stimulate gastric acid secretion
  - Inhibition causes decreased gastric juices and decreased acid content

## H2 Blockers

- Uses
  - Gastric and duodenal ulcers
  - GERD
  - Zollinger-Ellison Syndrome (gastrin secreting tumor)
  - Dyspepsia
- Routes
  - Nizatidine can be given PO only
  - All others PO and IV

## H2 Blockers

- Metabolism
  - Only cimetidine is metabolized by liver
  - Particularly: warfarin, phenytoin, theophylline, lidocaine
- Adverse effects
  - Again, cimetidine is only one with significant
  - Antiandrogenic: gynecomastia, impotence, decreased libido
  - CNS: confusion, hallucinations, CNS depression or excitation
- Moral: just say no to Cimetidine

## Proton Pump Inhibitors (PPI)

- Omeprazole (Prilosec)
- Lansoprazole (Prevacid)
- Rabeprazole (Aciphex)
- **Pantoprazole (Protonix)**
- Esomeprazole (Nexium)
- Mechanism
  - Inhibits hydronium-potassium pump
  - Prevents production of acid
  - All cause irreversible inhibition except lansoprazole

## PPIs

- Uses
  - PUD
  - GERD
  - Prevention of ulcer with NSAIDs
- Kinetics
  - PO: All; IV: pantoprazole, lansoprazole
- Adverse effects
  - Headaches
  - Nausea
  - Diarrhea
  - Food poisoning?
- Interactions
  - Only rabeprazole (digoxin)

## Sucralfate

- Mechanism of action: forms a gel that adheres to ulcer and protects it
- Kinetics: PO with minimal systemic absorption
- Uses: Duodenal ulcer
- Adverse effects: constipation
- Interactions: antacids decrease action, impedes absorption of several other drugs

## Misoprostol

- Mechanism of Action
  - Prostaglandin E1 analog
  - Stimulates mucus production
  - Reduces acid secretion
  - Maintenance of GI blood flow
  - Non GI: Induce termination; “ripen” cervix
- Adverse effects: diarrhea, ABD pain, dysmenorrhea

## Antacids

- Mechanism of Action
  - Alkaline substances neutralize acid
  - May stimulate prostaglandins
- Uses
  - PUD
  - Dyspepsia (indigestion)
  - GERD (symptoms only; does not prevent Barrett’s esophagus)

## Antacids

- Adverse Effects
  - Constipation and Diarrhea
  - Sodium loading
  - Check renal function before giving Mg containing antacids (CNS toxicity)
- Interactions
  - Inhibits absorption of many drugs

## Magnesium hydroxide

- Potent and long acting
- Solo: MOM
- Combo with AlOH common
- Causes diarrhea (often used as laxative)
- Avoid in patients with bowel obstruction or surgery
- Check renal function

## Aluminum hydroxide

- Weaker and slow acting
- Causes constipation
- Rarely used alone. Combine with MgOH
  - Maalox
  - Mylanta

## Calcium carbonate

- Fast acting and potent
- Potential for rebound
- Calcium source
- Constipation
- Calcium Dioxide gas

## Vomit Reflex

- Vomiting center
  - Cerebral cortex (fear, anxiety)
  - Sensory signals
  - Vestibular
- Chemoceptor trigger zone (CTZ)
  - Stomach
  - Small intestine
  - Emetogenic substances
- Antiemetics better at preventing than stopping

## Serotonin receptor antagonists (-setrons)

- Uses
  - Most effective at preventing chemotherapy vomiting
  - Radiology
  - Surgery
  - PO or IV
  - Effects augmented by adding dexamethasone

## Serotonin receptor antagonists (-setrons)

- Adverse effects
  - Headache, diarrhea, dizziness
  - Does not cause EPS
- Agents
  - Ondansetron (Zofran)
  - Granisetron (Kytril)
  - Dolasetron (Anzemet)

## Dopamine Agonists

- Phenothiazines
  - Promethazine (Phenergan)
  - Chlorpromazine (Compazine)
- Butyrophenones
  - Haloperidol
  - Inapsine
- Metoclopramide
  - Prokinetic

## Dronabinol (Marinol)

- Nausea & vomiting associated with chemotherapy
- AIDS
- Adverse effects
  - Psychoactive: dysphoria, depersonalization, temporal dissociation
  - Hypotension, tachycardia
- Abuse potential: Schedule III

## Other

- Glucocorticoids
  - Not FDA approved
    - Usually used in cancer patients
    - Used in combination, esp with -setrons
  - Methylprednisolone (Solu-medrol)
  - Dexamethasone
- Benzodiazepines
  - Not FDA approved
  - Lorazepam

## Motion Sickness Drugs

- Anticholinergic
  - Scopolamine
- Antihistamines
  - Dimenhydrinate (Dramamine)
  - Meclizine (Antivert)
  - Cyclizine (Marezine)
- All work by making the patient drowsy
  - May increase risk of falls

## Salicylates

- Sulfasalazine (sulfonamide)
  - Metabolized in intestine
    - 5-ASA
    - Sulfapyridine
- Mesalamine
  - 5-ASA
- Olisazine
- Balsalazide

## Prokinetic

- Metoclopramide
  - Actions
    - Suppresses emesis (blocks serotonin)
    - Increases upper GI motility (enhances ACH)
  - Uses
    - Nausea, Postop emesis, Gastroparesis, GERD
  - Adverse effects
    - Sedation, Diarrhea, EPS
- Erythromycin – off label
  - (200mg QID, AC & HS)