GI BLEEDING AND FOREIGN BODIES

DEAN N SILAS MD
OBJECTIVES

• Understand current endoscopic methods for management of GI bleeding
  • Injection
  • Thermal
  • Mechanical
  • Combination

• Management and classification of anticoagulants & anti-platelet agents

• Appropriate use of pharmacologic agents to control bleeding

• Discuss signs and symptoms of esophageal foreign bodies

• Describe the criteria for endoscopic intervention with esophageal foreign bodies

• Describe the endoscopic equipment used for management of GI bleeding and foreign bodies
ER/ON CALL

• Communicate
  • Starts with initial phone call
  • What type of case
    • Expected plan & equipment

• Be Prepared
  • Anticipate the unexpected

• Know your equipment
  • Be familiar with accessories BEFORE procedure
  • Pre-procedure simulation
  • You may have more experience than MD

• Sedation plan
• Don’t forget the airway!
FOREIGN BODIES

- Most common reason at our institution for coming in after hours
- Pediatric (6 mo-5 yrs)
  - Non food
- Adult
  - Food
  - Non food
  - Typically in patients with psychiatric disease, prisoners, developmentally delayed, intoxicated
FOREIGN BODIES

• Natural history
  • 80 to 90% pass spontaneously
    • If already in stomach, most will pass
    • Exceptions: 6 cm long
      > 2.5 cm diameter?
  • 10 to 20% require endoscopic management
    • May be higher with intentional ingestions
  • < 1% will require laparoscopic or open surgical intervention
PEDIATRIC FOREIGN BODIES

- 80% of all Foreign Body cases occur in children
- Age range: 6 mo.– 5 yrs.
- 96,806 cases  (2008)*
- 98% unintentional
- Most common:
  - Buttons
  - Pen or bottle caps
  - Marbles
  - Coins
  - Disk batteries (i.e. used in watches and calculators)

*www.aapcc.org
FB SIGNS & SYMPTOMS

• Sialosis
• Dysphagia
• Odynophagia
• Sensation of the foreign body
  • Location of symptom, does not accurately locate anatomic location of FB
• Respiratory symptoms including wheezing, stridor
• Neck swelling, neck tenderness, crepitus
CRITERIA FOR ENDOSCOPIC INTERVENTION

Emergent (Immediate EGD)
- Complete esophageal obstruction
- Disc batteries in esophagus
- Sharp objects in esophagus

Urgent (EGD within 24 hrs)
- Esophageal FB – not obstructed, not sharp
- Objects > 6 cm long
- Magnets within endoscopic reach
CRITERIA FOR ENDOSCOPIC INTERVENTION

- Non urgent endoscopy vs observation
- Coins in esophagus
- Gastric objects > 2.5 cm in diameter
  - Most gastric FB pass spontaneously
- Disk/cylindrical batteries in stomach
  - Remove if don’t resolve in 24-48 hrs
FOREIGN BODY MANAGEMENT

• Adjunctive agents – **not recommended**
  • Meat tenderizer
  • Carbonated beverages
  • Promotility agents, i.e. metoclopramide
  • Lubricating agents, i.e. mineral oil

• Avoid trial of liquids in ER
  • May delay sedation

• Glucagon
  • Relax smooth muscle
  • Little evidence of efficacy
FOOD BOLUS IMPACTION

- Typical foods:
  - Meat (steak, chicken, beef, pork, hotdogs)
  - Some fruits and vegetables
  - Fish/Fish bones
FOOD BOLUS IMPACTION

• Underlying esophageal pathology common
  - Schatzki’s ring
  - Eosinophilic esophagitis
  - Achalasia
  - Anastomotic stricture
  - Peptic stricture
  - Esophageal web
  - Tumor
ENDOSCOPIC TECHNIQUES

- Piecemeal Removal
- En-bloc Removal
- Push Technique

- ASGE Guideline – 2002 -recommended not to push into stomach without evaluating esophagus distal to obstruction

Eisen, GM et al. Gastrointest Endosc 2002
FOOD BOLUS
PUSH TECHNIQUE

Pro
• Faster
• Reliably effective
• Carefully push/slide scope between mucosa and bolus
• No perforations in 2 studies (N=375)

Con
• Potential for esophageal injury with unknown distal anatomy

Vicari JJ et al. Gastrointest Endosc 2001,
Longstreth GF et al. Gastrointest Endosc 2001
FOREIGN BODY PROTECTOR HOOD

Intubation / capture position

Retrieval / extubation position
AIRWAY PROTECTION

- Consider intubation for
  - Inability to handle secretions
  - Proximal esophageal FB
  - Difficult to remove objects
  - Multiple objects
  - Pediatric

- Should it be used for all cases of UGI FB?
  - ASGE states conscious sedation is appropriate for “most adult cases of FB ingestion”
## ENDOTRACHEAL INTUBATION

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Airway protection</td>
<td>• Logistical issues</td>
</tr>
<tr>
<td>• Excellent relaxation</td>
<td>• Expense</td>
</tr>
<tr>
<td>• More controlled procedure</td>
<td>• Anesthesiologist</td>
</tr>
<tr>
<td>• Personal experience suggests better outcome</td>
<td></td>
</tr>
<tr>
<td>• Anesthesiologist</td>
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</table>
OVERTUBE

- Allows multiple passes of scope
  - Piecemeal removal
- Protects esophagus
  - Sharp objects
- Aids removal of large objects
  - Pull into overtube then remove
- Airway protection
  - Not as effective as intubation
OVERTUBE TECHNIQUE

• Overtube/Scope passed as one unit
• Proper size of overtube
  • Avoid gap between scope and overtube
  • Reduces mucosal pinch injuries
• Some overtubes have caps to minimize leak
EQUIPMENT LIST

- Retrieval nets
- Overtubes in both esophageal and gastric lengths
- Polypectomy snare
- Polyp grasper
- Rat tooth forceps
- Alligator forceps
- Dormier basket
- Banding cap
- Foreign body protector hood
RETRIEVAL NETS

• Fully enveloping
• Protective, pouch-like design
• Assures capture
• Minimizes risk to patient airway
ADDITIONAL DEVICES

- Retrieval basket
- Snare
- Graspers forceps
- Rat tooth forceps
- Alligator
SHARP AND POINTED OBJECTS

• In esophagus a medical emergency
  • Immediate endoscopic removal
• In stomach or proximal duodenum
  • Endoscopic removal
• Negative radiologic exam
  • Endoscopic evaluation
• “leading points puncture, trailing points do not”
  • Orient the pointed end so it is trailing distally during extraction
  • May have to push into stomach to turn
• Remember to protect the esophagus/airway
  • Foreign body hood
  • Overtube
ILLUSTRATIVE EXAMPLE OF UNUSUAL FB MANAGEMENT

• 23 yo healthy F had “bagel stuck in throat”
• Tried to dislodge with plastic fork
• Inadvertently swallowed fork
FOREIGN BODY MANAGEMENT SUMMARY

- Treatment plan
- Airway Protection
- Clear secretions
  - Suction available
- Relaxation
  - Personal experience suggests easier procedures with GA
- Push/Slide by technique
  - Debulking / debridng needed in some food bolus cases
  - Be gentle
- HAVE THE RIGHT ACCESSORIES
  - Know how to use them
UGI BLEEDING: EPIDEMIOLOGY

- 100/100,000 US
- >300,000 hospitalizations/yr
- $2.5 billion
- Average LOS = 5.7 days
- Mortality 5%
  - No significant change despite advances in care
  - Increasing age and co morbidity of pts
- 80% bleeding stops spontaneously
  - Endoscopic therapy is primary treatment modality
CLINICAL FEATURES: GI BLEEDING

- Hematemesis
  - Confirms UGI bleeding
  - Present in about 50% of UGI bleeding
  - No role for NG tube for diagnosis
    - Triage
      - Non clearing red blood = poor prognosis
      - May empty stomach in preparation for endoscopy
CLINICAL FEATURES: GI BLEEDING

• Rectal bleeding
  • Upper or lower sources
• Melena
  • Primarily from upper source (70%)
  • 30 cc blood to produce black stool
  • 8 hours to turn black
• Blood in stool
  • Maroon, red, dark red
  • Primarily lower GI bleeding
  • 10% of “LGI bleed” are UGI bleeding
    • Role of NGT/EGD
PRE ENDOSCOPY PLANNING

- Resuscitate – Good IV access, transfusions, oxygen
- Protect airway – Massive bleeding, long procedure
- Correct coagulopathy
- Appropriate location & staff
  - ICU vs OR vs GI lab
- Equipment ready before you need it
  - Scope - therapeutic
  - Epinephrine
  - Clips
  - Cautery/probes
  - Bands
  - Irrigation
ENDOSCOPY CART SUPPLIES

- Therapeutic/Standard Scopes
- Bite Blocks (peds/adults)
- Forceps, Snares
- Injection needles, bipolar probe, bands, clips
- Overtube
- Cautery/APC/Pump
- Lavage kit
- Specimen Containers

- Sedatives
- Airway devices
  - Ambu, endotracheal tubes
- Suction
  - Patient & Scope
- Crash cart available
ENDOSCOPY

- **After** stabilization
- **EGD** - 95% sensitive in finding bleeding site
  - Therapy in 25% of patients
- **Early endoscopy leads to**
  - Risk stratification
    - ICU vs. non-ICU vs. Home
  - Therapeutic capabilities
  - Reduced transfusion/surgery requirement
  - Reduced LOS & cost
  - No documented mortality benefit
• Adequate visualization mandatory
  • Inadequate clearance of fundic pool – more transfusion, surgery, LOS, and mortality
• Role of erythromycin?
  • 3 mg/kg (250 mg) x 1 30-90 min prior to egd
  • Clears stomach of blood
  • Improves successful hemostasis
  • Reduces need for additional interventions
• H₂O₂ ?
  • May improve visualization through blood
• Second look endoscopy not necessary in most cases
UGI BLEEDING: ETIOLOGY

• PUD
  • DU – 30%
  • GU – 25%
• Gastritis – 10%
• Portal hypertension – 10%
  • Varices
  • Gastropathy
• Esophagitis – 5%
• MWT – 5%
• AVM’s – 5%
• Tumors – 5%
• Dieulafoy’s lesion – 1%
• Aortoenteric fistula -<1%
ENDOSCOPIC PREDICTION OF BLEEDING RISK (STIGMATA OF RECENT HEMORRHAGE)
ENDOSCOPIC PREDICTORS OF REBLEEDING
WHAT IS A VISIBLE VESSEL?
SCHEMATIC OF BLEEDING VESSEL

1. Arterial bleeding
2. Large red clot contiguos with sentinel clot/vv
3. Small red sentinel clot/vv
4. Dark sentinel clot/vv
5. White sentinel clot
6. Clot disappears
ADHERENT CLOTS – WHAT TO DO?

- 1989 – NIH Consensus conference – leave them alone
REBLEEDING RATES WITH ADHERENT CLOT

Caveat – data with high dose IV PPI also suggests reduced bleeding with adherent clots
# SUCCESS OF ENDOSCOPIC THERAPY

<table>
<thead>
<tr>
<th></th>
<th>Sham N=23</th>
<th>MPEC (N=21)</th>
<th>p-value</th>
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<tbody>
<tr>
<td>Hemostasis</td>
<td>2 (13%)</td>
<td>19 (90%)</td>
<td>&lt;.0001</td>
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<tr>
<td>Transfusion</td>
<td>5.4</td>
<td>2.4</td>
<td>&lt;.002</td>
</tr>
<tr>
<td>Hosp Stay</td>
<td>7.2</td>
<td>4.4</td>
<td>&lt;.005</td>
</tr>
<tr>
<td>Mortality</td>
<td>3 (13%)</td>
<td>0</td>
<td>NS</td>
</tr>
<tr>
<td>Cost</td>
<td>$7,550</td>
<td>$3,420</td>
<td>&lt;.001</td>
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## WHO TO TREAT?

<table>
<thead>
<tr>
<th>Stigmata</th>
<th>Endoscopic Rx</th>
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<tbody>
<tr>
<td>Active bleeding</td>
<td>Yes</td>
</tr>
<tr>
<td>Non-bleeding VV</td>
<td>Yes</td>
</tr>
<tr>
<td>Adherent clot</td>
<td>Probably</td>
</tr>
<tr>
<td>Flat spot</td>
<td>No</td>
</tr>
<tr>
<td>Clean Base</td>
<td>No</td>
</tr>
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</table>
HOW TO TREAT?
ENDOSCOPIC THERAPEUTIC OPTIONS

- Injection
  - Dilute epinephrine
  - Saline
  - Cyanoacrylate
- Thermal (contact)
  - Bipolar probe
  - Monopolar
  - Heater probe
  - Radiofrequency ablation
- Thermal (non contact)
  - APC

- Mechanical
  - Hemoclips
  - Band Ligation
  - Endoloop

- Combination Therapy
INJECTION

- Simple low cost technique
- Reduce blood flow by tamponade
- Vasoconstriction
  - Epinephrine 1:10,000 – 1:100,000
- Sclerosants
  - Ethanolamine
  - Polidocanol
- Ethanol
- Tissue Adhesives
  - Fibrin glue
  - Thrombin
  - N-butyl-2-cyanoacrylate (Histoacryl)
INJECTION THERAPY

• Dilute epinephrine
  • 1:10,000-100,000
  • Tamponade, vasoconstriction, improved platelet aggregation
  • Initial hemostasis – near 100%
    • Rebleeding -15-30%
    • Less rebleeding if combined with other Rx
    • Do NOT use as sole technique!

• Technique
  • Inject multiple sites around bleeding point
  • Easier injection with smaller syringes
  • More is better – up to 30 cc

• Potential for tachycardia and arrhythmias
CONTACT THERMAL THERAPY
MULTIPOLAR OR BIPOLAR

• Applied perpendicularly or tangentially
• Compress vessel, then coagulate
  • Coaptive coagulation
  • Endpoint – obliteration of vessel, cessation of bleeding
  • Not effective for vessels > 3 mm
  • Tissue adherence – irrigation may prevent
• Larger (10 Fr) probes more effective than smaller probes
• Rebleeding up to 30%
  • Improved results with combo Rx
COMBINATION THERAPY

- Injection first
- Fluid may reduce risk of perforation or cautery injury
- Single device available
- Most studies show combination therapy more effective than injection alone
HEMOSTATIC CLIPS

- First developed in 1975
  - Performance improving rapidly
  - Sometimes difficult to place
    - Posterior bulb, high on lesser curve
  - Which device to use? No Comparison Data
  - Value of rotatable clips?

- Direct tissue opposition
  - Better in coagulopathy?
  - Less tissue damage
  - < 2 mm vessel
URGENT VS ELECTIVE EGD

- 93 pts
  - Urgent (< 3 hrs) vs Elective (< 48 hrs)
- More high risk lesions in urgent group
- Similar LOS
- Timing of EGD did not influence outcomes

- OP management recommended in 40%
  - Only done in 40%!
EMERGENT VS URGENT EGD

- Emergent (< 8 hr) vs Urgent (8-24 hr)
- Retrospective
- More therapy in emergent group
- Outcomes no different
  - LOS, rebleeding, transfusions, surgery, death

- Use emergent (ie middle of night) endoscopy in selective cases only!
HEMOSTATIC SPRAY

- Developed from battlefield/traumatic applications
- Non contact, non mechanical
- Powder sprayed onto bleeding site
  - Precise localization NOT necessary
- May be revolutionary advance in endoscopic hemostasis
- Not available
VARICEAL BLEEDING

Varices

Esophagus

Liver

Stomach
VARICEAL HEMORRHAGE: MEDICAL MANAGEMENT

• **Octreotide**
  - 50 microgram bolus, 50 microgram/hr infusion
  - Start if diagnosis suspected
  - Minimal side effects
    • Safer than vasopressin +/- nitrates
  - Continue 72-96 hours
  - Initial control = EGD/EVL

• **Antibiotics**
  - All cirrhotics with GI bleed should receive abx
    • Mortality Improvement
    • Reduce SBP risk
VARICEAL HEMORRHAGE: ENDOSCOPIC THERAPY

- Variceal Ligation
  - Effective control of bleeding
  - Eradication
  - Safer than sclerotherapy
  - Post ligation ulcers
    - PPI prophylaxis post EVL
    - May be more difficult than ES with active bleeding
- Sclerotherapy
- Glue
  - Cyanoacrylate – Gastric varices
- Sengstaken-Blakemore tube
  - Historical interest only
VARICEAL LIGATION
LIGATION TECHNIQUE

• Endoscopically locate the varices
• Begin with the most distal varix and proceed circumferentially to proximal
• Press ligating unit against varix
• Suction to “Red Out”
• Continue to suction and
• Deploy band
GI BLEEDING: PHARMACOLOGIC THERAPY

• Acid Suppression
  • Goal pH >6
  • optimal platelet & coag factor function
  • inactivate proteolytic digestion of fibrin clot by pepsin

• PPI
  • Benefit only demonstrated in PUD
  • Reduced rebleeding
  • Reduced surgery
  • No reported tolerance

• H2RA’s
  • Cannot provide necessary pH increase
  • Tolerance
  • No role in UGI bleed
IV PPI THERAPY FOR BLEEDING PUD

High risk patients, endoscopic therapy
IV Omeprazole (80 mg bolus, 8 mg/hr x 72 h) vs placebo
156 High risk ulcers – NBVV or adherent clot

Omeprazole 80 IV bolus + 8 mg/hr x 72 hr
CLOPIDOGREL VS ASA/PPI

320 pts prior ASA bleed, H. pylori neg

Clopidogrel 75 mg/d vs. ASA 80 mg + esomeprazole 20 mg bid
ANTICOAGULANTS/ANTI-PLATELET AGENTS

- Warfarin
- Heparin
- Dabigatran etexilate (Pradaxa)
- Rivaroxaban (Xarelto)
- Apixaban (Eliquis)
- Aspirin/NSAID’s
- Clopidogrel
- Ticlodipine
- Dipyramidole
- Glycoprotein IIb/IIIa inhibitors
  - Tirofiban (Aggrastat)
  - Eptifibatide (Integrilin)
  - Abciximab (ReoPro)
NEW ANTICOAGULANTS

Dabigatran (Pradaxa)
• Thrombin inhibitor
• Prevents more strokes than coumadin
• No INR monitoring
• Prolongs PTT
• 1/3 have GI side effects
• 150 mg BID
  • Stop 1-2 d for elective scopes
  • 3-5 d with renal insufficiency
• No reversal agent

Rivaroxaban (Xarelto)
• Factor Xa inhibitor
• Once daily
• Similar efficacy to warfarin
• No reversal agent

Apixaban (Eliquis)
• Factor Xa inhibitor
• BID
• More effective than warfarin with less bleeding
• No reversal agent
NEW ANTIPLATELET AGENTS

**Ticagrelor (Brilinta)**
- 90 mg BID
  - Used with ASA 81 mg
- Reversible binding to platelet receptor
- Stop 5 days

**Prasugrel (Effient)**
- 10 mg daily
  - w/ASA 81-325 mg
- Stop 7 d
ASGE RECOMMENDATION
PROCEDURE RISKS

High Risk
• Polypectomy
  • Colon 1-2%
  • Gastric 4%
• Sphincterotomy 2%
• Esophageal dilation ?
• EUS w/FNA 1%
• PEG 1-2%
• Variceal therapy ?

Low Risk
• Diagnostic
  • colon, EGD, EUS, ERCP
• Biopsy
• ERCP w/stent
<table>
<thead>
<tr>
<th>High Risk</th>
<th>Low Risk</th>
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<tbody>
<tr>
<td>• Afib w/valvular heart disease</td>
<td>• DVT</td>
</tr>
<tr>
<td>• Mitral mechanical</td>
<td>• Afib w/o valvular heart disease</td>
</tr>
<tr>
<td>• Any mechanical valve with prior event</td>
<td>• Bioprosthetic valve</td>
</tr>
<tr>
<td>• Stop warfarin 3-5 d, bridge with LMWH</td>
<td>• Aortic mechanical valve</td>
</tr>
<tr>
<td>• Don’t stop ASA</td>
<td>• Stop warfarin 3-5 d</td>
</tr>
<tr>
<td></td>
<td>• Don’t stop ASA</td>
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</table>
ANTI-PLATELET AGENTS

• No guidelines available
• Most common recommendation
  • Stop clopidogrel 7-10 d
  • Do not stop ASA
  • Recent reports suggesting safe to continue
  • What to do – I have no idea
  • Takes 3-5 days to reach full effect

• GP IIb/IIIa inhibitors
  • Eptifibatide & tirofiban – effect resolved in 4 hr
  • Abciximab – lasts up to 24 hr
HEPARIN

- Heparin
  - Stop 6 hrs prior to procedure
- LMWH
  - Stop 8-12 hours prior
- When to restart
  - Individualized
  - Most suggest immediately
ANTICOAGULANT / ANTI-PLATELET
TAKE HOME MESSAGE - 2013

• Trend is to **avoid** stopping anti thrombotic therapy
• Avoid thromboembolic risk
• Take slight procedural related bleeding risk
• No studies have demonstrated increased post procedural bleeding in pts on ASA
• Increased malpractice risk for stopping therapy
APPROACH TO GI BLEEDING: SUMMARY

• Urgent endoscopy not necessary in most
  • Resuscitate, stabilize, & treatment plan
• Early endoscopic evaluation & therapy
• Most lesions can be identified, and treated
  • Don’t use injection alone
  • Combination therapy better than single technique
  • Hemoclips are an effective alternative to combination therapy
SUMMARY

• Appropriate management of anticoagulation
  • Pay attention to potential thromboembolic complications
• Pharmacologic therapy
  • IV PPI drip x 72 hrs in high risk lesions
  • Oral PPI adequate in most
ADDITIONAL READING

Management of ingested foreign bodies and food impaction
GastrointestEndosc 2011,73: 1085-1091.