Prevention, Early Detection, and Management of Endoscopic Complications

Pramod Malik, MD, FACG, FASGE, AGAF, CPI
Gastroenterologist
Gastrointestinal and Liver Specialists of Tidewater
Suffolk, VA
Basic Rules

• *Primum non nocere* = First no Harm
• Closed loop communications (read back verification EVERYTIME)
• Entire team on the same page
• No fear to ask question
• Inventory monitoring system
What are we trying to prevent?

• Complications (immediate)
  • Bleeding
  • Perforation
  • Cardio respiratory compromise
  • Getting stuck (up the creek...)

• Failure
  • Incomplete therapy
  • Repeat therapy

• Late
  • Stricture, recurrence, incomplete resection
Prevent

• Case selection
  • Cardio-resp stability
  • Anticoagulants/ anti-platelet agents

• Correct equipment
  • Right scope, right accessories

• Appropriate training
  • Endoscopist
  • Tech or Nurse
  • Consider dedicated resources (staff)
Prevent: How to?

• Endoscopist role
  • Case selection
  • Do what you can do, no more
  • Ask for help
  • Abort if needed (no pride)
  • Come back another day
• Know the equipment
  • Accessories, cautery setting, alternative equipment
• Have a back up plan
• Communicate with the team
Prevent: How to?

• Nurse and GI Tech’s role
  • Know the case
  • Do what you can do, no more
  • Ask for help
  • Know the equipment
    • Accessories, cautery setting, alternative equipment
  • Have equipment at hand
  • Have a back up plan
  • Communicate with the team
  • Check status before giving additional sedation
  • Order verbal confirmation
  • It is okay to question at appropriate time
Closed loop communication

• Read back verification
  • Doctor: “Give 25 mg of Fentanyl IV push”
  Nurse: “25 mg Fentanyl IV push”
  Doctor: “That’s correct”

• Respect for team members

  (Video)

• Call out status
  • A total of 100 mcg Fentanyl, 4 mg Versed
  • Pulse ox is 88% on 4 liter O2
Prep – Colonoscopy cart

- Snares (consider Lariat, duckbill, Captivator, Olympus stiff snare)
- Injection needle, biopsy forceps
- Intelligent cautery and/or APC
- Epinephrine, clips,
- Savary wire if poor prep
- Suction button (red) – spare
- Irrigation – set up
- Specimen trap, cautery pad & foot paddle, saline, MB, Indigocarmine, specimen container
Preventing Colon Perforation

• Scope insertion
  • Minimal insufflation with air, consider water exch.
  • No air or insufflation in obstructing colon cancer
  • DO NOT TRY TO PASS obstructing colon cancer
  • Pull, not push
  • Mindful of the pressure, esp MAC
• Abdominal pressure:
  • Loop sigmoid - LLQ or RLQ
  • Loop transverse - pull LUQ up, mid-abd pressure
  • Can’t reach cecum - mid-abd, LLQ, RUQ
Preventing Colon Perforation

• Polypectomy
  • Cold snare if possible
  • Large saline cushion (not just a few ml)
  • Careful with stiff snares or monofilament snares
  • Know the “travel” on the finger grip
  • Decompress the lumen (thickens the wall)
  • Inspect polypectomy site closely (target sign)
Prevent spleen trauma - Colo

• Almost always female, older
• No relation with scope/ MAC or no
• Seems to happen with loop reduction
• Role of abdominal pressure and difficult colon?
• Identification
  • In recovery LUQ pain, shoulder pain
  • Usually a few days later, sharp LUQ pain
  • Under-recognized (1 in 6,000)
• Rx – CT, observe in hospital, operate if bleeding
Prevent failed colonoscopy

• Use CO2, minimal insufflation, liberal water irrigation
• Reduce the loop
• Reduce hernia BEFORE starting
• Don’t force or push
• Use pressure immediately (L early on)
• MAC allows better pressure
• Match scope to the case
Effective Polypectomy

• Never attack a polyp partially
• No value in biopsy (if resection possible)
• Inject saline to push polyp in your view
• Use cap fitted scope
• Use meth blue tinted saline injection
• Do not wash off mucus off a suspected polyp
• Variety of snare
• Combined with laparoscopic guidance
• Inject SPOT at least 3-5 cm away from site
Prep - Bleeder Cart

- Overtube, secure airway
- Two good suctions, 2 good IVs
- Coag probe, APC if needed, injection needle, clips
  *(Instinct, Resolution, Olympus, Ovesco)*
- Cap for the scope
- 1:10,000 epinephrine
- Sclerosant
- Tattoo ink
Effective bleed control

- Choose the correct scope
- Identify bleeding source
  - Move pool of blood by changing pt position
  - Use cap for angles/ stable exposure (esp. duod/ GE jn)
- Control airway (GA)
- Be patient, irrigate and clear
- Mark bleeder in tics (SPOT and clip)
- Use band or Ovesco for diverticular bleed
Prep - Foreign Body cart

• Secure airway, over tube, good sedation (MAC?)
• FB net
• Cap
• Snare, tripod not usually helpful
• Regular, rat-toothed forceps/ Alligator/ magnet/ endo scissors
• FB hood
Esophageal perf - Prevention

- Don’t dilate dramatically
  - Achalasia – no more than 25-30 mm to start
- Fill dilating balloon with dilute contrast if fluoro
- If large or tough dilation, re-insert scope
- Narrow caliber esophagus - beware
- No blind bouginage (esp. if diverticulum)
- Use fluoroscopic controlled slick wire
- Consider rendezvous technique
Prep – ERCP Cart

• Back up scope (always a regular EGD scope)
• Various tomes, caths, extraction balloon, dilating balloons, stents, wires (various length), snare, rat tooth and bx forceps
• Pull wires to match the accessories (0.018, 0.021, .035”)
• 11 # knife, perm marker, hole punch
• CO2 insufflation, intelligent cautery, pad
• Position – monitors side-by-side, patient in swimmer’s position, tech to the R of MD, fluoro m/c out of field
• Contrast (diluted if needed)
Prevent Failed ERCP

• Case selection – altered anatomy
• Experience (few docs in each group)
• Loan JF (diagnostic) scope if stricture
• L lateral position helps enter duodenum
• Choose accessory to match the papilla
• Small wire/ dome tip
• No small cuts
• Use CRE balloon for large stones
• Precut early
ERCP Pancreatitis

• Case selection
• Young female with prev pancreatitis – highest risk
• Gentle technique
• Do not inject without knowing – esp. in PD (call it)
• No forcing the wire
• Precut early if experienced
• Cut or blend current - cut quickly away from the PD
• PD stent – narrow (3-5 Fr, long w/o flap, or short)
• Rectal Indomethacin supp 100 mg at the end
• 250-300 ml/hr Lactated Ringer IV if high risk
Bleeding – now what?

• Have supplies handy
• Irrigation, suction, airway, vitals, good IV
• Identify the site, type of bleeding site
  • Change patient position
• Clip (best for fresh if good access)
• Injection epi – gets field cleared
• Cautery – avoid if in colon or duodenum
• Call for back up (Surgery/ IR) if needed
Perforation – now what?

- Any site (stop leak, manage leaked contents)
  - Stop air insufflation (switch to CO2)
  - Assess for leaked air and its effect
  - Antibiotics
  - Clear the field
  - Supplies
    - Clips, Ovesco, Band ligation
  - Drain the fluid away (minimize contamination)
  - Bypass perf with a stent
Perforation – now what?

• Endo staff action
  • Target resources to manage it best
  • Notify family of possible complication and keep updated
  • Antibiotics
  • Watch for effects of leaked air
  • Alert surgery or radiology staff if indicated

• Endoscopist action
  • Resources to manage complication and for other cases
  • Close if possible
  • Order the correct test
  • Talk to team, surgery, radiologist, family
Perforation – What Tests?

• Free air does not mean much
• Watch patient condition (O2 sat, BP, distress, subcutaneous air, JVD)
• CT with oral or rectal contrast ONLY (no IV)
• Contrast in X-ray immed prior to scan, NOT before
Perforation – Esophagus

- Large stent (fully covered) – risk of migration
- Clip with cap suction
- Consider NG tube?
- Antibiotics
- W/F tension pneumothorax/ mediastinum
- Post therapy CT w oral gastrografin
Perforation – Gastric

- Clip with cap suction
- Consider NG tube
- Antibiotics
- Post therapy CT w oral Gastrografin
Tension Pneumo

• Diagnosis
  • Seen with perf (duod or colonic for pneumoperitoneum)
  • Esophageal with tension pneumothorax
  • Low BP, O2 sat
  • Abd distended and tight
  • Hard to bag if vented

• Treatment
  • Puncture with Angiocath 14G
    • Anywhere in abd (if pneumoperitoneum)
    • 2nd intercostal space in chest (If pneumothorax)
Perforations are an uncommon but serious complication of endoscopy. Although they are well recognized, no universally accepted strategy for their management exists. The need for management algorithms in situations that call for multiple interventions in a short time, with coordinated effort encompassing multiple providers from different specialties, has long been recognized, but no such clinical care pathway has been developed for the management of endoscopic perforations. Since perforations are uncommon, a predetermined plan of action can streamline patient management. Furthermore, such a plan demonstrates preparedness on the part of the gastroenterologist. We developed an endoscopic perforation management strategy based on the best available scientific evidence and our specific resources. We report our experience in the hope that it may form a useful framework for gastroenterologists attempting to do the same at their own institution.

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