Endoscopic Management of Enteral perforations

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Objectives

• Discuss management of
  – Acute intestinal perforations
  – Enteral Fistulae and leaks

• Disclosures: None
Endoscopic approach is not new

- Esophageal perforation: 1985, German
  - Endoscopic lavage and fibrin glue repeatedly
- Gastric perforation: 1993, German
  - clips after snare excision of a gastric leiomyoma.
- Colonic perforations: 1997 Japan
  - clipping of iatrogenic colonic perforation
Changing paradigm

• Shift towards endoscopic management of perforations and anastomotic complications
  – Likely avoid highly morbid operation

• Perforation is no longer a “disaster”
  – Full thickness resection is intentionally done
Advantages of endoscopic approach

• Immediate closure: you are there
  – Avoidance of perpetuation of inflammation

• No open surgery
  – Less pain, Early diet

• Shorter length of stay
Armamentarium

• Clips
  – Through the scope
  – Over the scope clips
• Stents
• Suturing system
• Glue, sponge, tissue /bioabsorbable patches
• Techniques: ESD, ablation
Be prepared

• Discuss potential perforation/full thickness intervention ahead of time
  • Outline what would happen if a perforation happens
  • High risk: surgical consultation ahead of time

• Be prepared for a perforation
  – Right team, right place, Use CO2
  – Right devices
    • Endo clips, OTSC’s, Stents, suturing devices
When you have a perforation

• Do not panic:
  – Note vitals, alert the anesthesia team

• Switch off air/insufflation
  – Do an exam under water
  – If feasible get a transparent cap on the scope
    • Intervention related perforations are small and in the operating field

• Treat or control your perforation immediately
  – Gas has already leaked out
Acute Perforations

- ESD
  - Eso/Stom/colon 5%
- Therapeutic endoscopy .1-2%
Gastric Perforation Closure

National Cancer Center Japan
2460 EMRs
(1987-2004)

Gastric Perforation
121 (5%)

Failed Closure → Surgery
2

Endoscopic Closure
117 (97%)

Successful Closure
115 (98%)

Minami et al. GIE 2006
Acute perforations

• Key is to recognize it immediately
• Window in window or Target sign should not be missed with EMR
  • 80% reduction in perforation rate
  prophylactic clipping: Bourke et al
Target sign
Inadvertent Muscularis propria excision
Complete: immediate perforation
Incomplete: delayed perforation

Michael Bourke
Director Gastrointestinal Endoscopy
Westmead Hospital, Sydney
Immediate recognition
Late recognition/using air
Scarred Duodenal TVA: FAP
Beware of tattoos
Suturing device: Overstich

• New generation easy to operate
  – Best for healthy tissue
    • Failure likely due to poor tissue, never good for suturing to begin with

  – Limitation
    • Clings on to debris and blood
    • Needs space

• TAS/G prox
Closure devices: Suturing

• Full thickness resection: 50 mm sessile

Descending colon polyp resected by modified endoscopic submucosal dissection, sutured 40 mm long defect and follow-up in 3 months
Full thickness resection: stomach
Intra procedure management

- Treat and proceed if appropriate
  - NEEDLE DECOMPRESSION if needed
    - Obliteration of liver dullness = pneumoperitoneum
    - Ideal site to decompress RUQ
- IV antibiotics/Antifungals
Intra procedure management

• If the perforation is not at the operative field
  – Treat if possible
  • Else decompress, suction all fluid, consider placing a guide wire, NGT
Closure Devices: endo clips

• Clips
  – Quick clips, Resolution and Wilson cook
    • Easy to use, even via side view scope
    • Do not always work
      – Large perf, induration, unhealthy tissue
Ovesco and Padlock clips

Courtsey, Prof Josep Armengol Miro, Barcelona

Courtsey, David J Desilets MD Bay State Medical Center, MA
Closure devices: stent

- Acute esophageal perforation
- Clips, suturing and stents are option
- May need thoracoscopic work depending on contamination and time to treatment
Covered Stents

• Definite role in esophageal perforations
POEM

• Full thickness myotomy
  – Mediastinal gas is common
  – Closure by clips/suture

  – Beware of complications from “air/gas leak” into the pericardium.
Anticipated course

- Depends on location, age and size of the perforation
  - Peak pain and discomfort in a couple hours
  - Elevated white count, Usually no fever
  - Decline of pain in <1-2 days
  - Able to take po liquids in 0-2 days and discharged home depending on location, symptoms, confidence of closure and protoplasm

- Antibiotics for 7-10 days
Management

• Keep NPO
• Contrast study to confirm absence of leak and establish baseline
• iv antibiotics: antifungals + broad spectrum for gastric perforation
• Consider early surgery
  – Unexpected course, high risk predictors
    • Fever, increasing WBC/pain/sepsis
Retroperitoneum: relatively forgiving

- Failed closure: conservative management
Anastomotic complications after foregut surgery.

- Most data on stenting for leaks and fistula
  - Several Small series
  - Overall effective in \( \frac{3}{4} \)th +
- Additional drainage or debridement may be needed.
- Collections can be drained similar to WOPN
Prophylactic stenting
Unexpected success:

- Always worth a try
  - Dehiscence $\frac{3}{4}$ the of the anastomosis
G-G fistula

- APC/BX/brush
- Clip/suture
- +/- glue

Ideal <1cm, 30-100% success
PEJ fistula
Exploiting a perforation/fistula

• Colon perforation with abscess
• Pseudocyst perforation into the gut
Scenarios

- Rescue of PEG
- Post operative: duodenal fistula
- ZE syndrome with recurrent perforation
- Post Trauma: TEF
- Post trauma: Cologastric fistula
- Post surgery: Colocutaneous fistula
- Recurrent liver abscess: Hepatico duodenal fistula
Summary

• Prepared endoscopic surgeon can successfully manage enteral perforations with a variety of devices now available
• Early surgery in failed cases
• Enteral stenting for leaks and fistulae has >70% of success
Thank you for your attention