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# Endoscopic Management of Surgical Leaks, Fistula, and Abscess

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# Disclosures

- Consultant for Boston Scientific Corp.
- Some devices may be presented used in an off-label indication

# Outline/Goals

- Definitions
  - Perforation
  - Leak
  - Fistula
  - Abscess
- Principles of management
- Available tools and techniques



# Perforation

- An acute disruption of the GI tract wall
  - Peritoneum
  - Retroperitoneum
  - Mediastinum/chest
  - Pelvis
- Exposure of the extraluminal space to luminal contents resulting in a clinical syndrome (with associated inflammation or infection)
- Unintentional
- Transmural (or nearly)
- Immediate or delayed
- Usually referred to in the context of GI procedure or spontaneous due to another illness

# Leak

- Surgical parlance equivalent to “perforation”
- Exposure of extraluminal space to intraluminal contents
- Usually in the context of a surgery
  - Anastomosis (suture line, staple line)
  - Failed closure, repair, etc.
  - Myotomy
  - Resection (e.g. liver, pancreas)
- Usually refers to postoperative phenomenon
  - Can be acute, early, late, chronic



# Abscess

- A contained, infected fluid collection generally with a “wall”
- May develop as result of disruption of the GI tract wall
  - Leak or perforation
  - Primary disease process
    - Diverticulitis
    - IBD
    - Contamination, peritonitis, etc
- Generally responds poorly to just antibiotics
- Needs drainage for source control to resolve sepsis syndrome

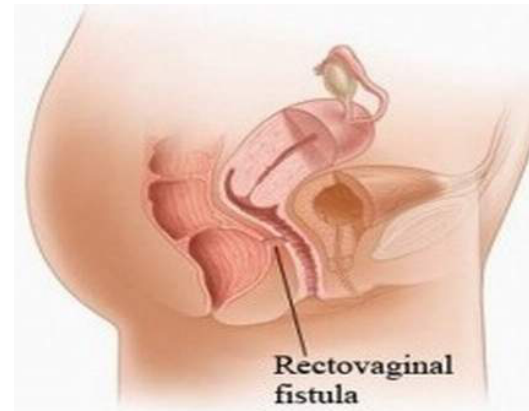


# Phlegmon

- Poorly defined inflammatory or infectious fluid collection
- Distinguished from abscess by lack of defined border or wall
- Less amenable to drainage
- May respond to antibiotics alone
- May develop into abscess (eg after liquefy and walled-off)

# Fistula

- Abnormal communication between two normal structures
  - Bowel to bowel
  - Bowel to bladder
  - Bowel to skin
  - Etc.
- Usually with a somewhat “mature” tract (epithelialized)
- Implies some degree of chronicity
- Can develop as a consequence of leak, perforation, or abscess (or primary disease process such as IBD)

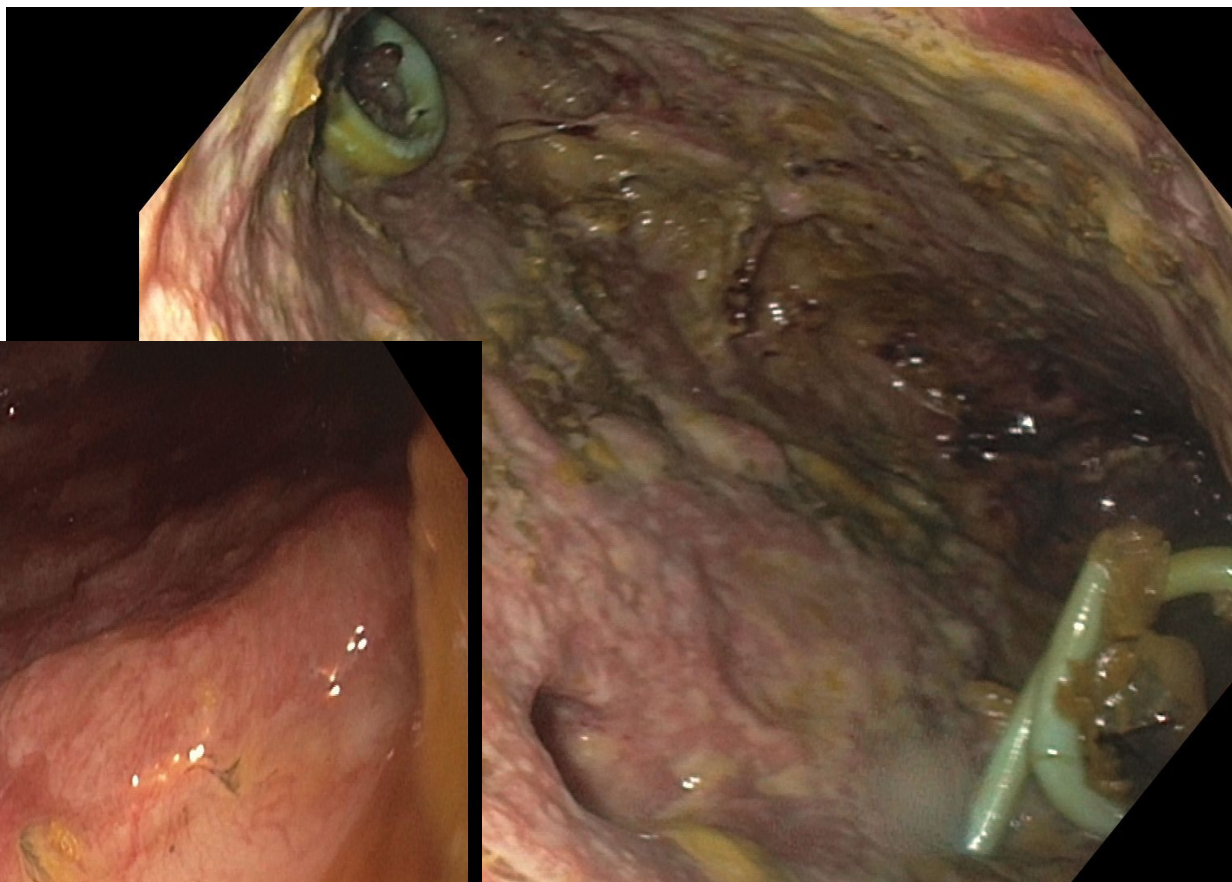




# Principles of management

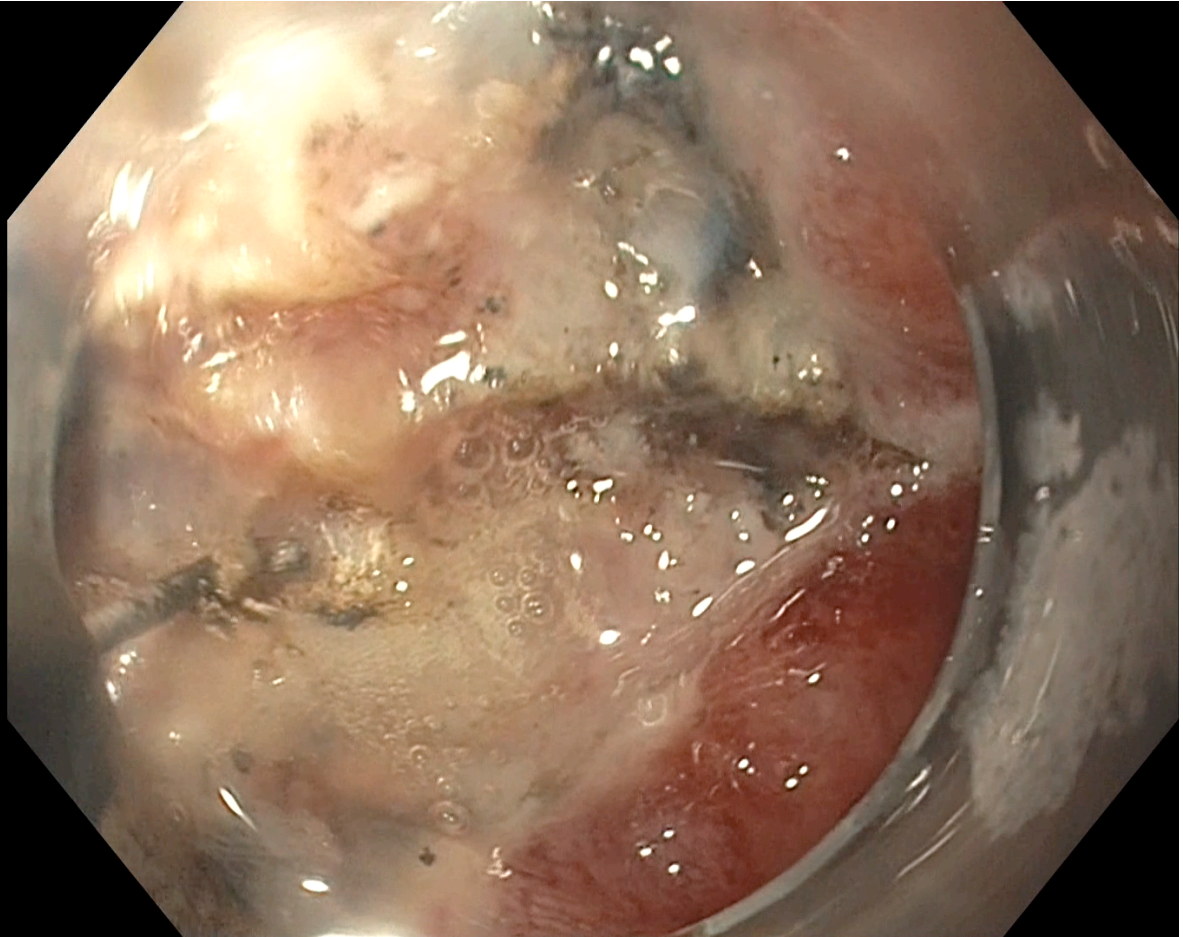
- Source control
  - Surgical exploration: washout; repair or diversion
  - Percutaneous drainage
- Stability of patient
- Suitability of target lesion
- Not “one size fits all”
- Diversion of bowel contents away from defect
- Epithelialized surfaces can't be fused readily
- Downstream obstruction or stricture will perpetuate failure
- Multidisciplinary discussion
- Set expectations (MDs and patients)

Example of  
unsuitable  
target



Principle: address the downstream stenosis

Gastric  
sleeve  
stenosis and  
leak



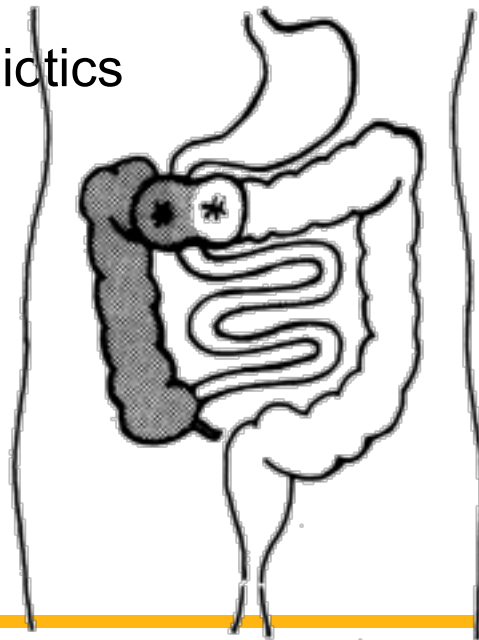
# A quick word about pancreaticobiliary leaks...

- Postoperative
  - Cholecystectomy
  - Liver or pancreas resection
- Traumatic
- Inflammatory
  
- Generally treated with bile or pancreas duct stenting (diversion)
- A separate talk...

# Management options

- Medical/supportive

- NPO, NGT
- TPN
- Antibiotics
- Time

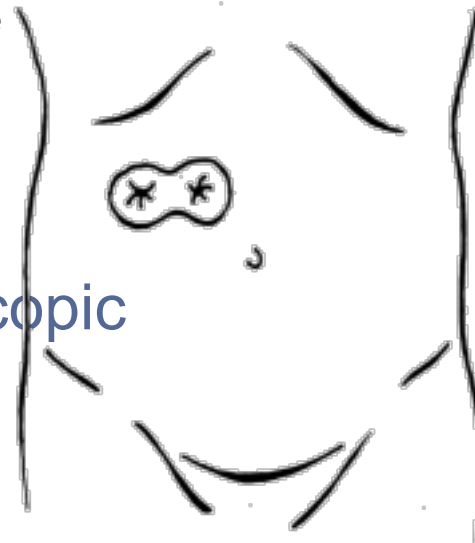


- Surgical

- Resect
- Divert (ostomy)
- Close
- Drain

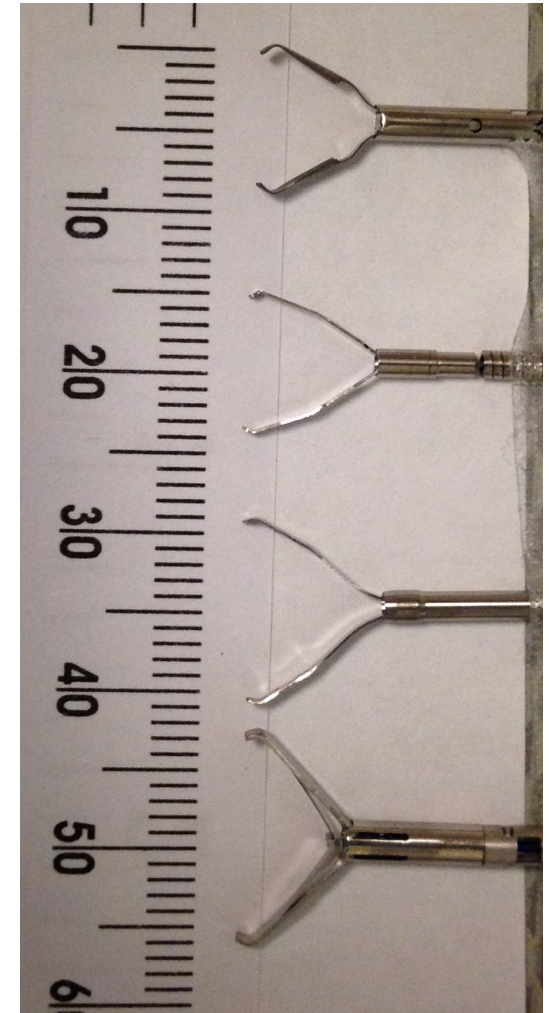
■ Active portion of colon  
□ Inactive portion of colon

- Endoscopic



# Endoscopic tools

- Clips
  - Through-the-scope
  - Over-the-scope
- Tissue adhesives
- Sutures
- Endoluminal (covered) stent
- Internal drainage
- Vacuum therapy



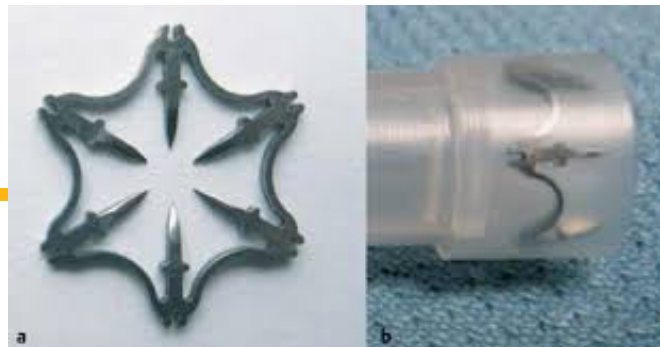
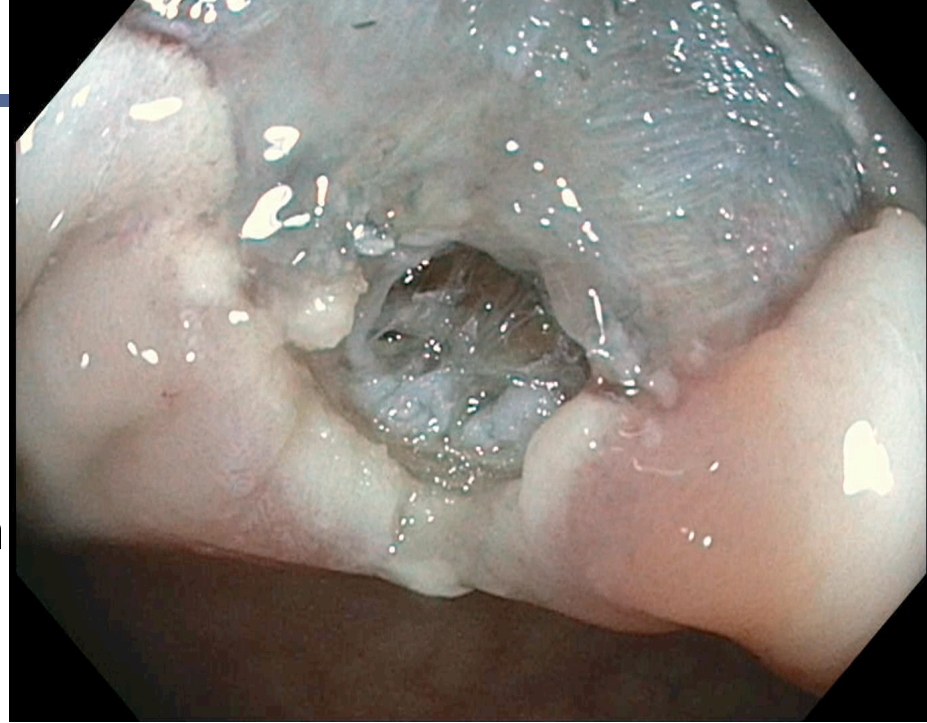
# Over-the-scope clip

- Advantages

- Easy to use and setup
- Adequate for defects <1.5-2 cm
- Robust

- Disadvantages

- Need to remove scope to setup
- Inadequate for medium or large defects
- Fibrous or inflamed tissue
- Narrow caliber lumen
- Misfire
- Removal



# Endoscopic suturing

- Advantage

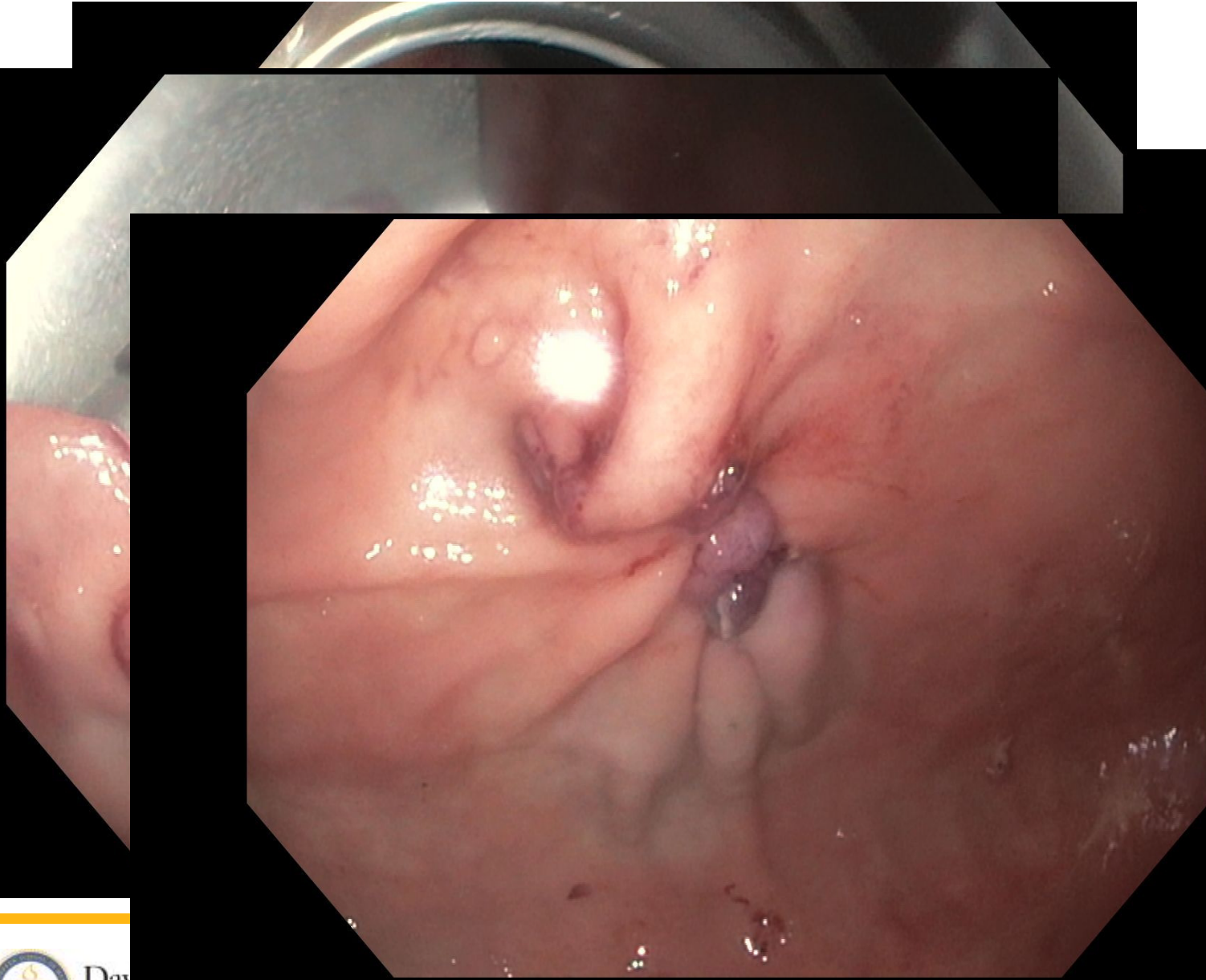
- Full thickness apposition of tissue
- Larger defects
- Potentially more robust than clips

- Disadvantage

- Some training in use and setup
- Need double channel scope
- Narrow caliber lumen
- Harder to use in tortuous or limited space anatomy
- Need to remove scope to setup







# Tissue adhesives

- Advantage
  - Easy to use
  - Can apply anywhere can get a scope
- Disadvantage
  - Most appropriate for narrow long tract
  - Usually ineffective as monotherapy
  - Availability and setup
- Fibrin, thrombin, cyanoacrylate



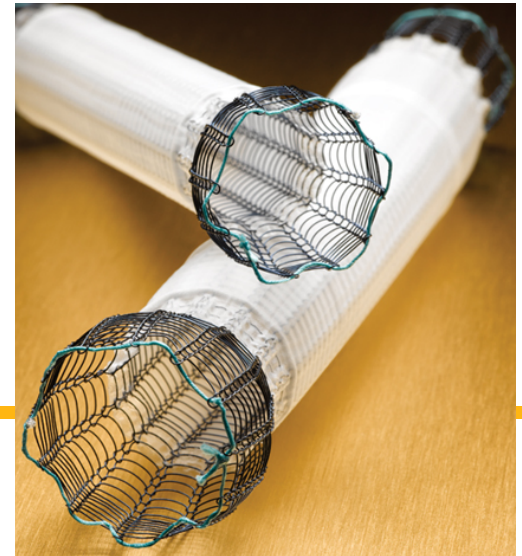
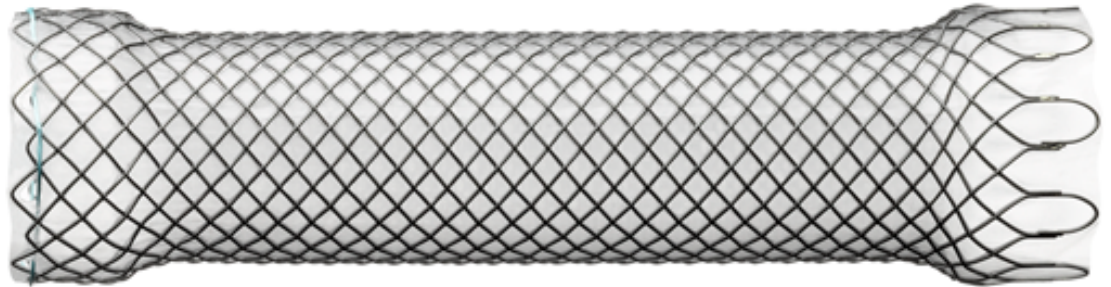
# Stenting

- Advantage

- Easy to do
- Works well in appropriate application

- Disadvantage

- Mostly appropriate for straight anatomy leaks (esophagus)
- Stent migration
- Leak around stent
- Stent related injury (potentially disastrous)

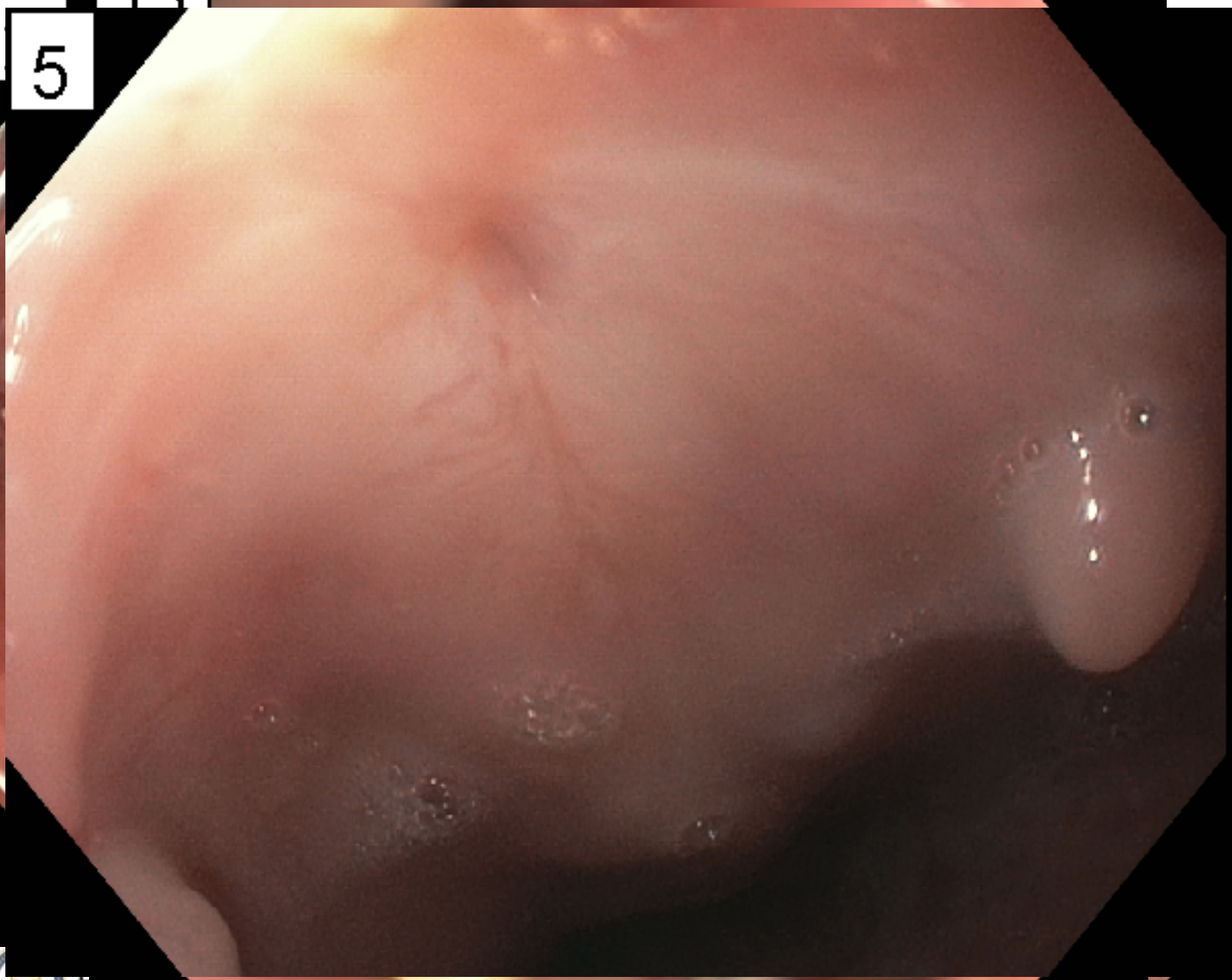


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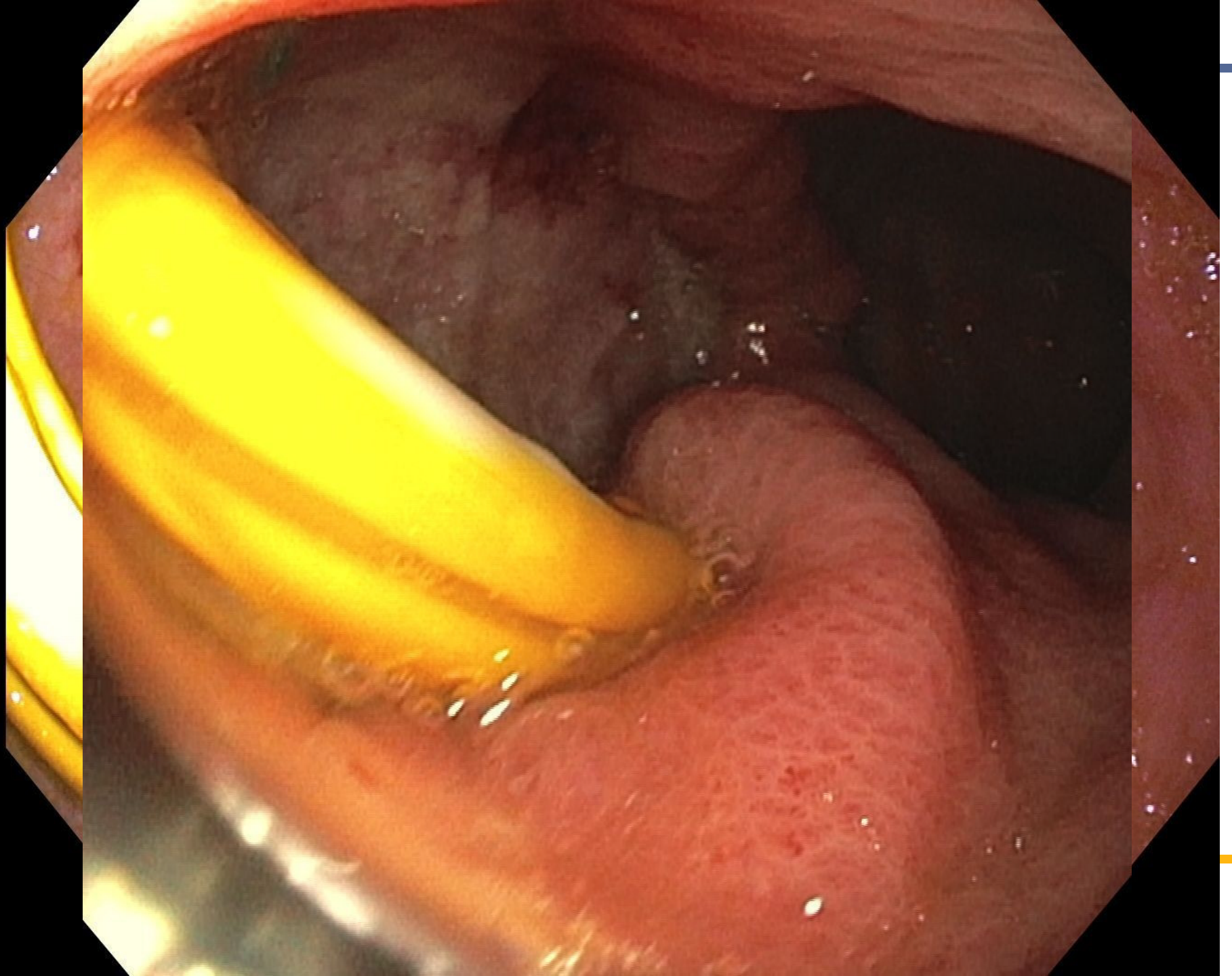
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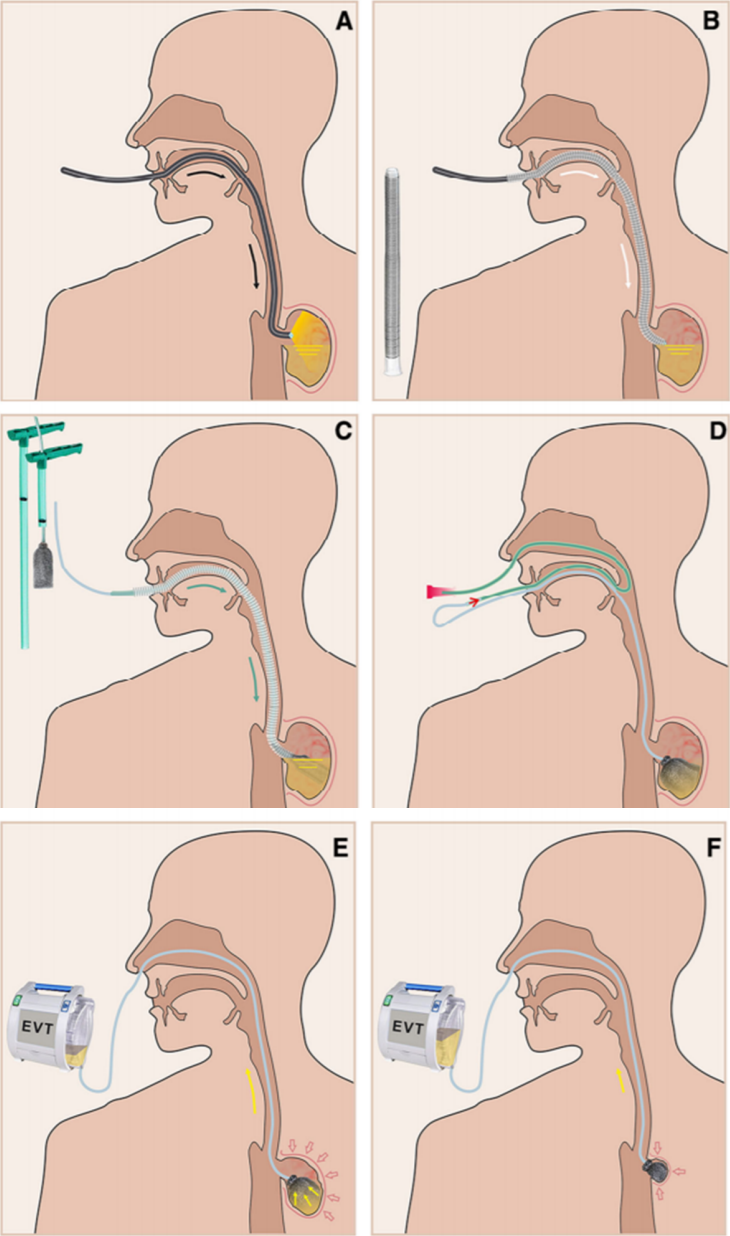


# Internal drainage

- Transluminal EUS guided drainage
  - Pigtail stents or Lumen apposing metal stents
  - Technically similar to pseudocyst drainage
  - Requires walled off target (i.e. abscess or chronic cavity)
- Marsupulization
  - Gastric sleeve leaks
  - Connecting a cavity to the GI tract lumen by purposefully expanding the defect



# Endoscopic vacuum therapy



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Thanks for your attention!