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Disclosures:

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Moderator:
Ali A. Siddiqui, MD
Dr. Siddiqui has no conflicts of interest related to this talk.

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THE CHALLENGING ESOPHAGUS: STRICTURES, FISTULAS, AND LEAKS

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THE "CHALLENGING" ESOPHAGUS

- Refractory strictures
  - Lye ingestion
  - Anastomotic
  - Idiopathic
- Perforations
- Fistulas
  - Benign
  - Malignant
- Leaks

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TYPICAL GI RESPONSE WHEN CALLED…

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TYPICAL GI RESPONSE WHEN CALLED…

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LEGITIMATE CAUSE FOR ALARM…

- Difficult technically
- Problems may be chronic
- High Risk
  - Patients
  - Interventions

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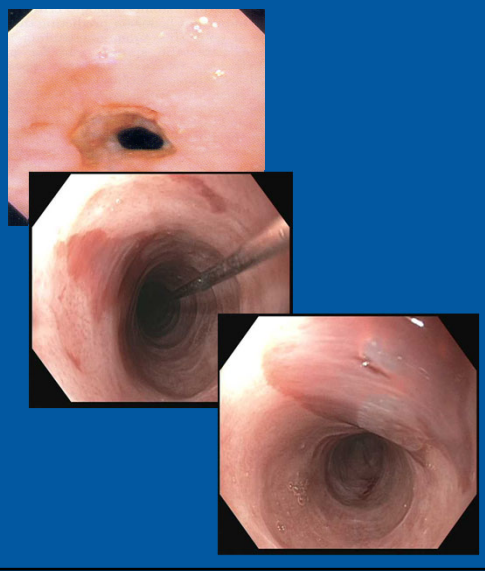
BENIGN ESOPHAGEAL STRICTURES

- Peptic
- Eosinophilic esophagitis
- Rings/Webs
- Caustic
- Iatrogenic
  - Post-surgery/anastomotic
  - Pill-induced
  - Radiation
  - EVL/Sclerotherapy
  - Endo Rx: EMR/ESD/RFA
- Derm/Autoimmune
  - Lichen planus
  - Bullous pemphigus



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BOUGIES AND BALLOONS HAVE EQUIVALENT OUTCOMES

Outcomes

- Improved swallowing in virtually all
- Strictures usually recur
- Balloons may cause less discomfort
- Equivalent safety
- Balloons more expensive than bougies
- Savary or wire guided dilation for complex strictures

Lesions not improved by dilation

- Extrinsic compression
- DES
- Hypomotility d/o
- Normal EGD
  - EoE r/o'ed
  - Controversial

GIE Dysphagia Guideline 2014;191-2011

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EOE BOUGIE DILATION: START LOW, GO SLOW

Table 1. General guidelines for esophageal dilation in EoE patients
Forewarn the patient that some degree of post-dilation pain is to be expected.
Careful endoscopy prior to dilation to assess the location of strictures and estimate esophageal diameter.
Start low with small diameter bougie/balloons and gradually dilate to 16–18 mm, if possible.
Gradual slow dilation is key with sessions separated by 3–4 weeks.
Limit the progression of dilation per sessions to ≤3 mm after resistance is noted. Stop with moderate resistance or blood on the dilator.
Look for tears if you must—but they only represent an adequate dilation.
For post-procedure chest pain, mild analgesia is recommended and rarely narcotics. Expected chest pain is monitored during recovery period and by telephone, if necessary.
After induction dilation sessions to 16–18 mm, repeat dilations are triggered by recurrence of dysphagia symptoms. Many patients will only need maintenance dilations every 2–3 years.

Am J Gastroenterol. 2016 Feb;111(2):214-6

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REFRACTORY ESOPHAGEAL STRICTURE

Demographics

- ~ 500,000 balloon dilations/year
  - Fewer bougie dilations performed
- < 10% refractory
- Lumen diameter
  - 18 mm regular diet
  - 15 mm modified diet
  - < 13 mm dysphagia

Stricture Severity

- Mild
  - EGD scope passes w/o resistance
- Moderate
  - Scope passes with resistance
- Severe
  - Can't pass scope

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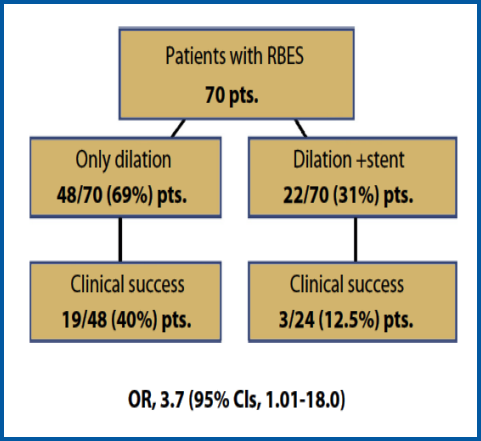
RBES LONG TERM OUTCOMES

- 70 pts followed 44 mos
- Mixed etiologies
- Median 15.5 dilations
- 31.4% resolution
- Adverse events 10%
  - Perf 4%
  - Fistula 6%
  - Death 3%
  - PEG/PEG 8%
  - Surgery 11%



Gastrointest Endosc 2016;84:222-8

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RBES TREATMENT OPTIONS

- Steroids
- Incision
- Stent
- Self bougienage
- Mitomycin
- Surgery
- Don't forget
  - Medical Rx
  - Lifestyle/Compliance

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STEROID INJECTION

- **Triamcinolone**
  - 10-40 mg/mL
  - 0.5-1 mL injections before dilation
  - Inject directly into area(s) of stricture/quadrant
- Studies are mainly small and observational
  - Improvement in dysphagia
  - Increased symptom-free intervals between dilations
  - Increase in maximum diameter achieved
  - Decreased need for subsequent dilations
- Probably best for acid-peptic strictures

Ramage. Am J Gastro 2005:2419-25
Alintas. *J Gastroenterol Hepatol* 2014;19:1388-91

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INCISIONAL THERAPY

- Needle-knife cautery technique
  - Cutting setting
  - Distal cap
  - May combine with dilation
  - Fluid cushion lift
- Single RCT vs. Savary dilation
  - 62 patients
  - No difference success rates
  - 80.6% vs 67.7%, P = .26
- Good for Schatzki rings or anastomotic

Hordiijk. *Gastrointest Endosc* 2009;70:849-55
Wills JC, DiSario JA, Fang JC. *GI Endo* 2008

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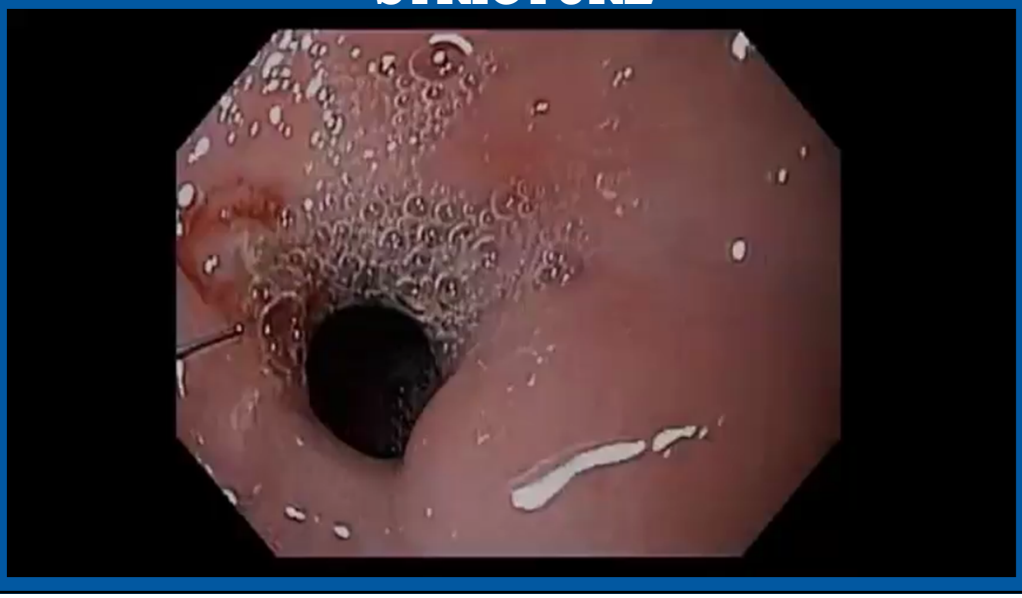
ELECTROSURGICAL INCISION ANASTOMOTIC STRICTURE



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STENTS FOR REFRACTORY BENIGN ESOPHAGEAL STRICTURES

- Usually for refractory treatment failures
  - Typically after dilation +/- steroid injection fails
- May need long term stents or serial SEMS
- Surgery often not an option for these patients
- Migration rate of 27-44%
- Overall effective in 24-40%

J Clin Gastroenterol 2016; 50:373-378; *Endoscopy* 2016;48(2):141-8

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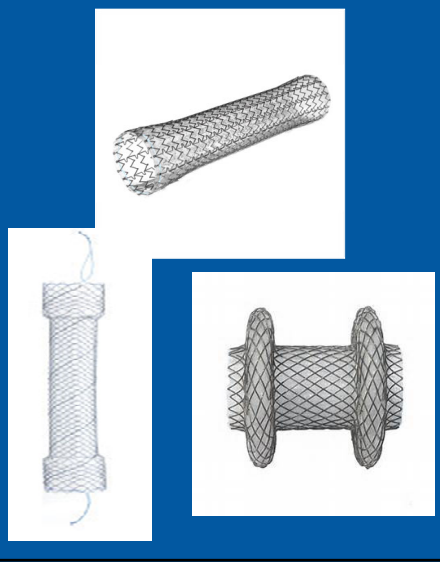
FULLY COVERED SEMS

- FDA approved FCSEMS
  - None for removability
  - Multiple manufacturers
  - Small sizes 12-16 mm, LAMS
- Tips:
  - Repositioned or removed with included suture
  - Duration:
    - Strictures: 3-6 mos
    - Fistula/perforation: 4-6 weeks
  - All removable
    - Stent w/in stent for embedded stent



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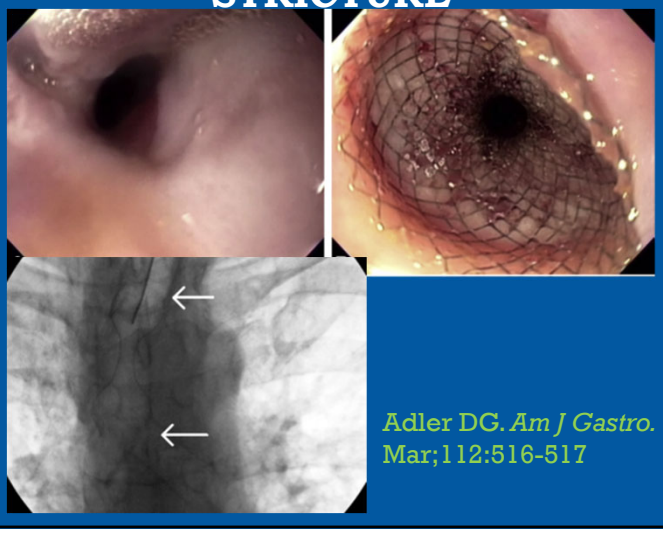
ESOPHAGEAL PLACEMENT OF A LUMEN-APPOSING METAL STENT IN A PATIENT WITH A CHRONIC ANASTOMOTIC STRICTURE



Adler DG. *Am J Gastro.* 2017 Mar;112:516-517

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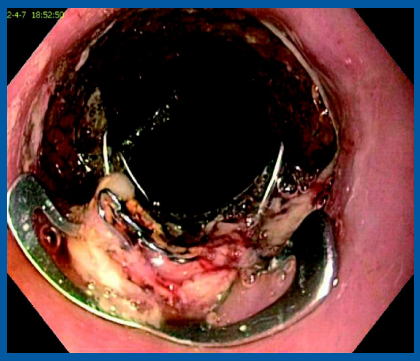
SECURING STENTS IN PLACE

- Attempt to reduce migration rates and increase effective dilation time
- OTC clips
- Suturing trials
  - 26 suturing and stent vs. 67 stent alone
  - Stent migration rate 7.7 % vs 26.9 %, p = 0.004
  - 21 suturing and stent vs. 41 stent alone
  - Stent migration rate 19.0% vs. 63.4%, p = 0.001



Wright A. *Surg Endosc* 2016 Dec 7
Yang J. *Surg Endosc* 2016; 2016 Aug 5

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MITOMYCIN-C FOR RBES

- Abx derived from *Streptomyces caespitosus*
  - Antineoplastic, antiproliferative
- Caustic, anastomotic strictures
- Considered experimental
- Technique
  - Dose 0.1 to 2 mg/mL; median, 0.4 mg/mL
  - Number applications (1-12; median =1)
  - Duration (1-5 min; median = 2 min)
  - Application Technique (cotton pledget, spray, and injection)

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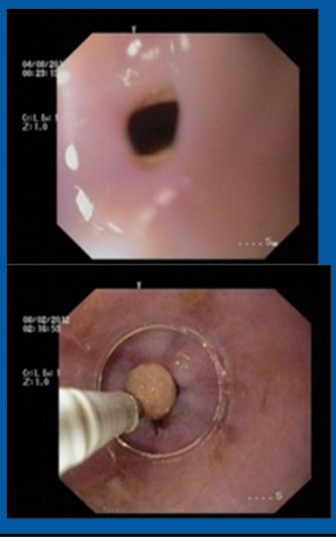
MITOMYCIN-C FOR REFRACTORY STRICTURES

- 24 studies, 145 pts
- 23 (4-60) mos f/u
- Caustic most common
- 59% CR, 21%PR



J Clin Gastro. 2015;49(10):837-47

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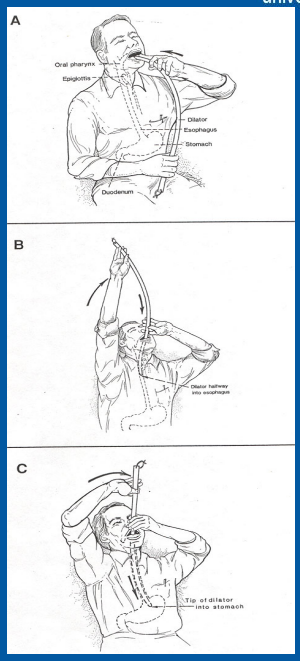
SELF-BOUGIENAGE

- Method
  - Video/Supervised practice
  - Frequency: Daily
  - 44-46 F Maloney
- Results
  - 7 reported series
  - Largest 32 pts f/u 37 mos
  - Improved vs. MD dilation
    - Dysphagia scores, wt, diameter
  - No complications



Dzeletovic, Fleisher. *Dig Dis Sci* 2013;58:3218-23

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FISTULAS/PERFORATIONS

- Fistulas
  - Usually chronic
  - Mostly TE fistulas
    - Radiation induced
    - Chemo induced
    - Secondary to stents
    - Idiopathic
- Perforations
  - Usually acute
    - Iatrogenic
    - Boerhaave's

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BENIGN VERSUS MALIGNANT FISTULAS

Benign

- Often a sequelae of prior treatment
  - Oncologic
  - Surgical
- Goal is to permanently close fistula
- Patients can live a long time

Malignant

- Usually means unresectable disease
- Patient lifespan short
- Goal is to minimize aspiration and allow swallowing
- Quality of life

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CAN YOU CLIP IT?

- Yes and no…
- If fistula or perforation small to medium in size→ Yes*
- If fistula large or multifocal → No

* Maybe

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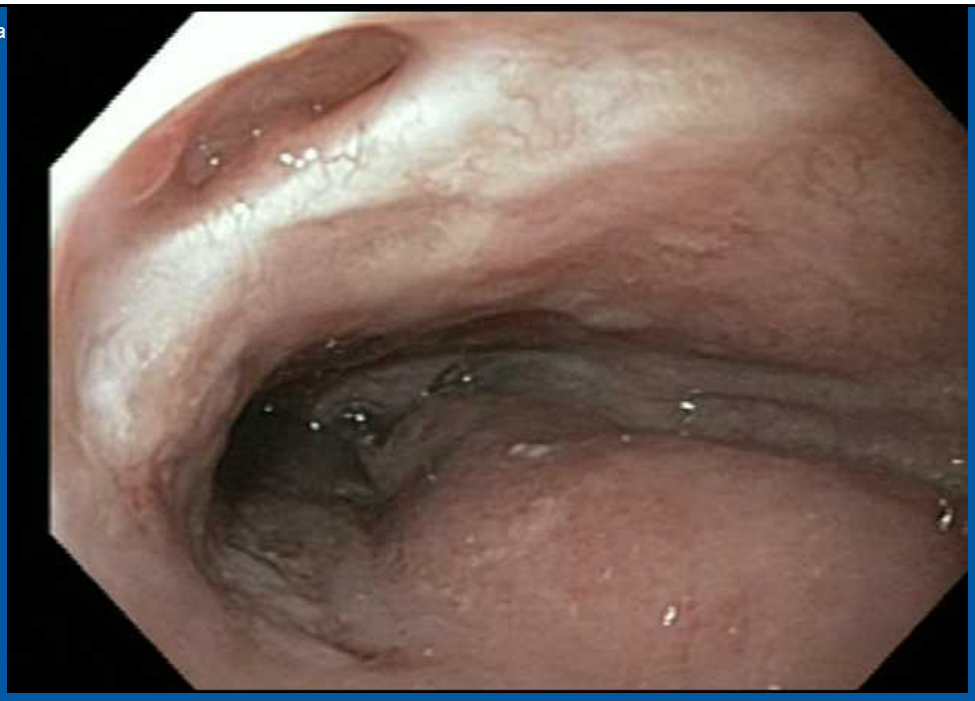

So B and Adler DG, ACG Case Reports Journal 2014

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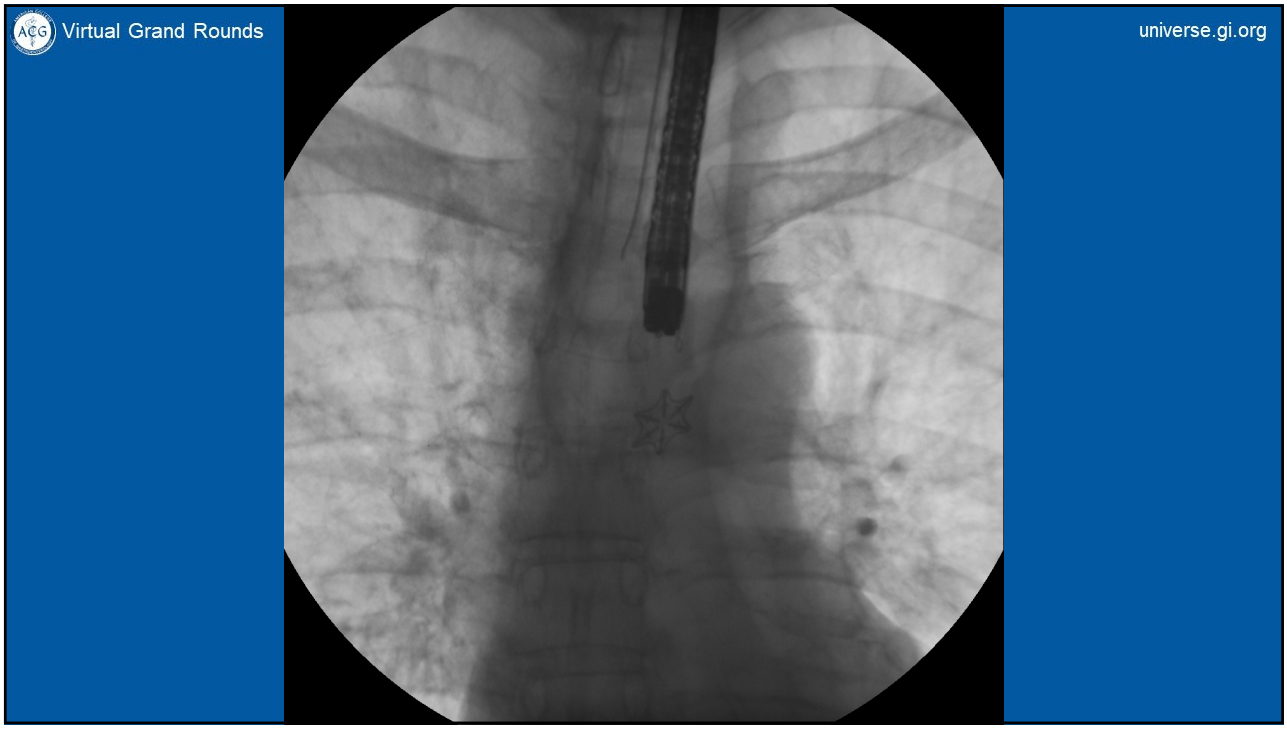
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CAN YOU SUTURE IT?

- Maybe…
- Data encouraging
- Tissue often not ideal for suturing
  - Friable
  - Poorly vascularized
  - "Wet tissue paper"
- May not achieve airtight seal
- Publication bias

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STENTS FOR FISTULAS?

Pro

- May seal fistula
- One stop shopping
- May be permanent intervention

Con

- Not airtight seal
- Patients can still aspirate with stent in place
- May be permanent intervention
- Patients may also need an airway stent

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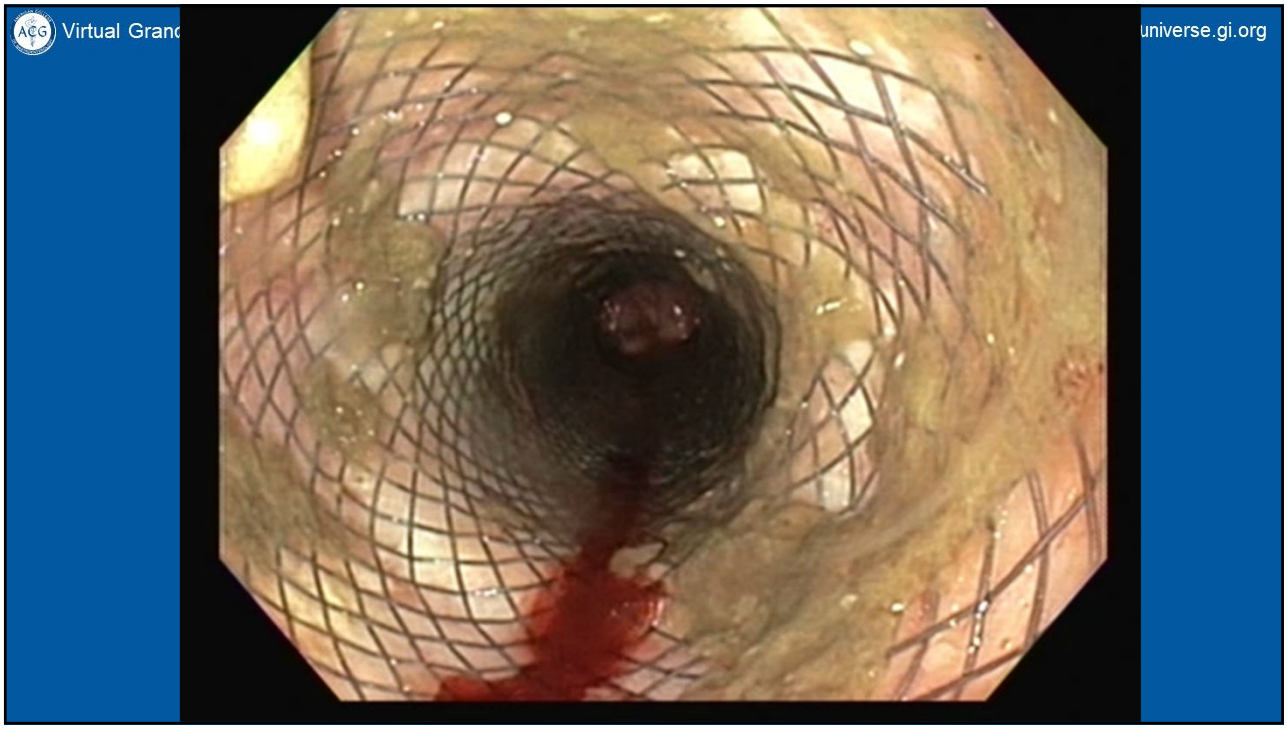

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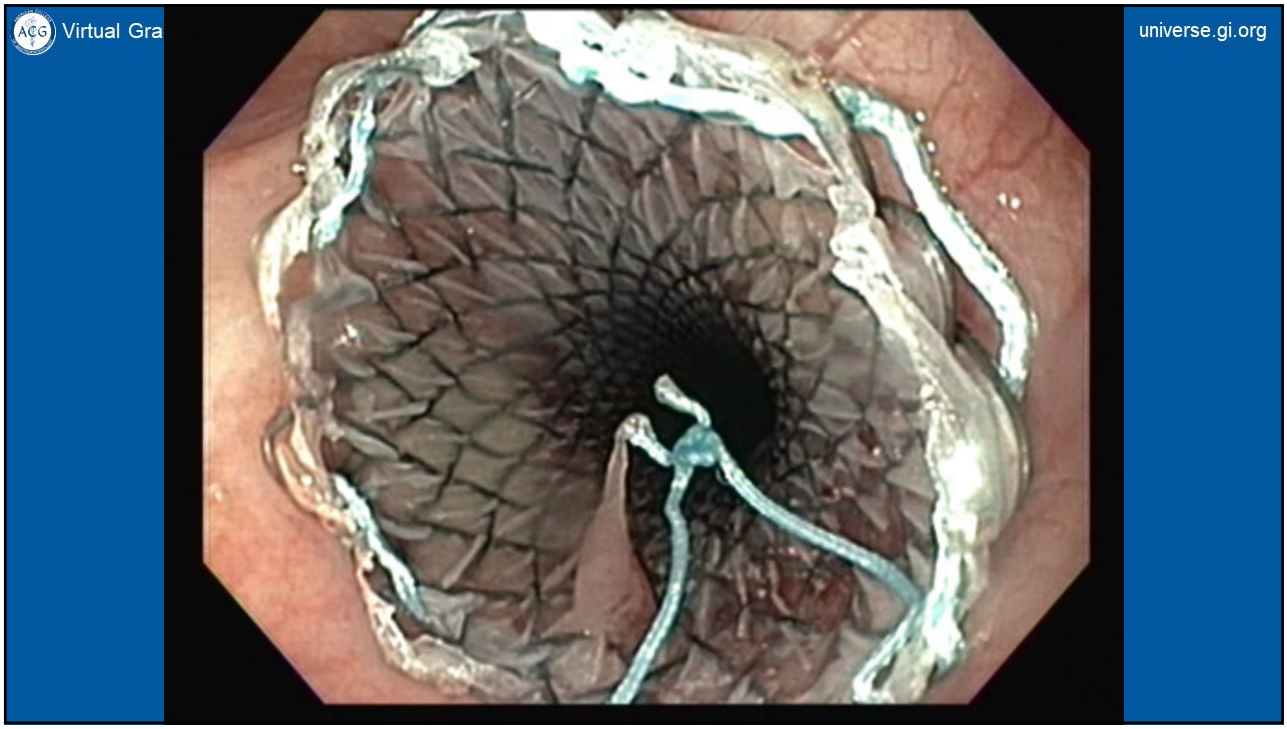

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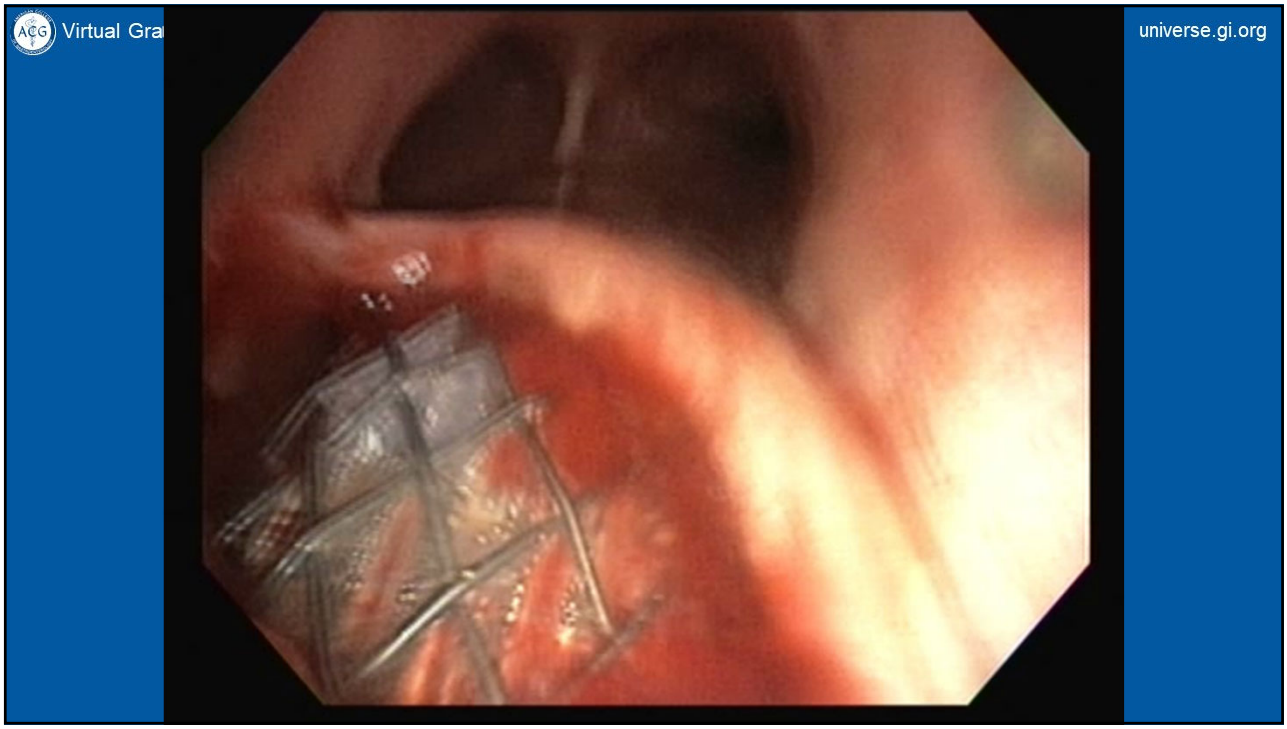
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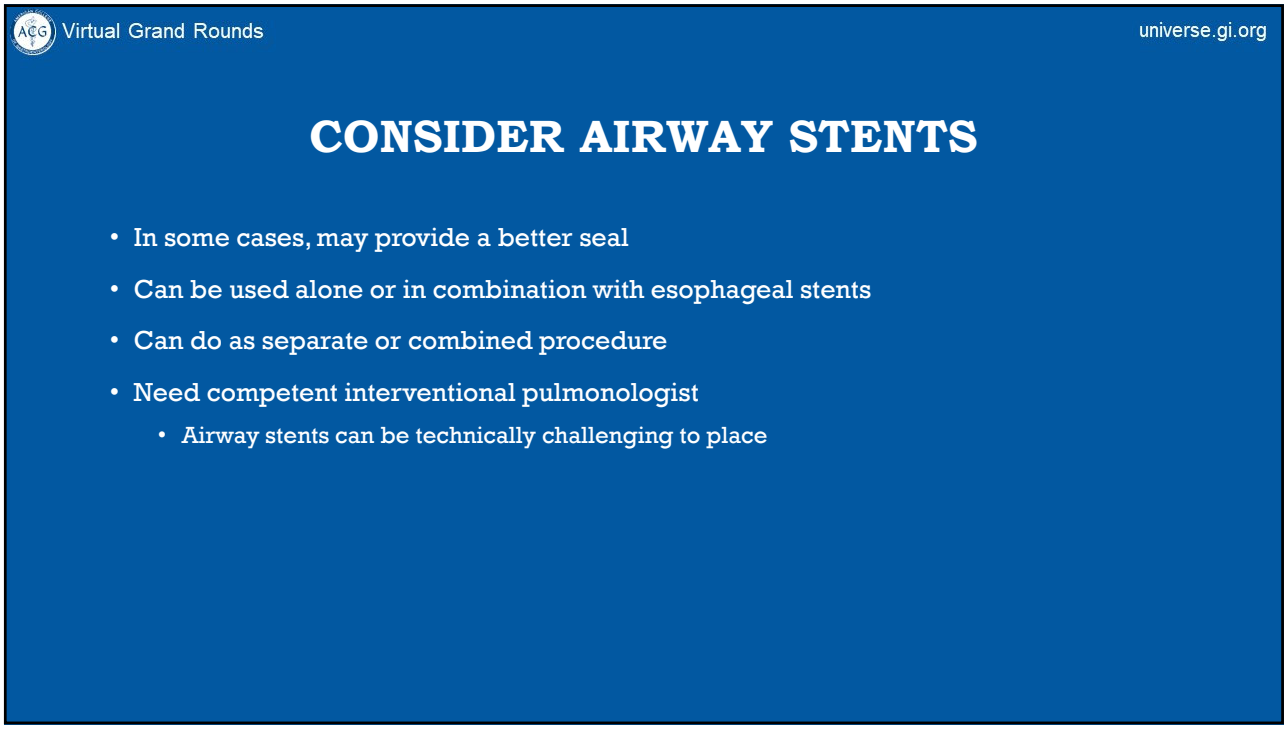
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CONSIDER AIRWAY STENTS
• In some cases, may provide a better seal
• Can be used alone or in combination with esophageal stents
• Can do as separate or combined procedure
• Need competent interventional pulmonologist
• Airway stents can be technically challenging to place

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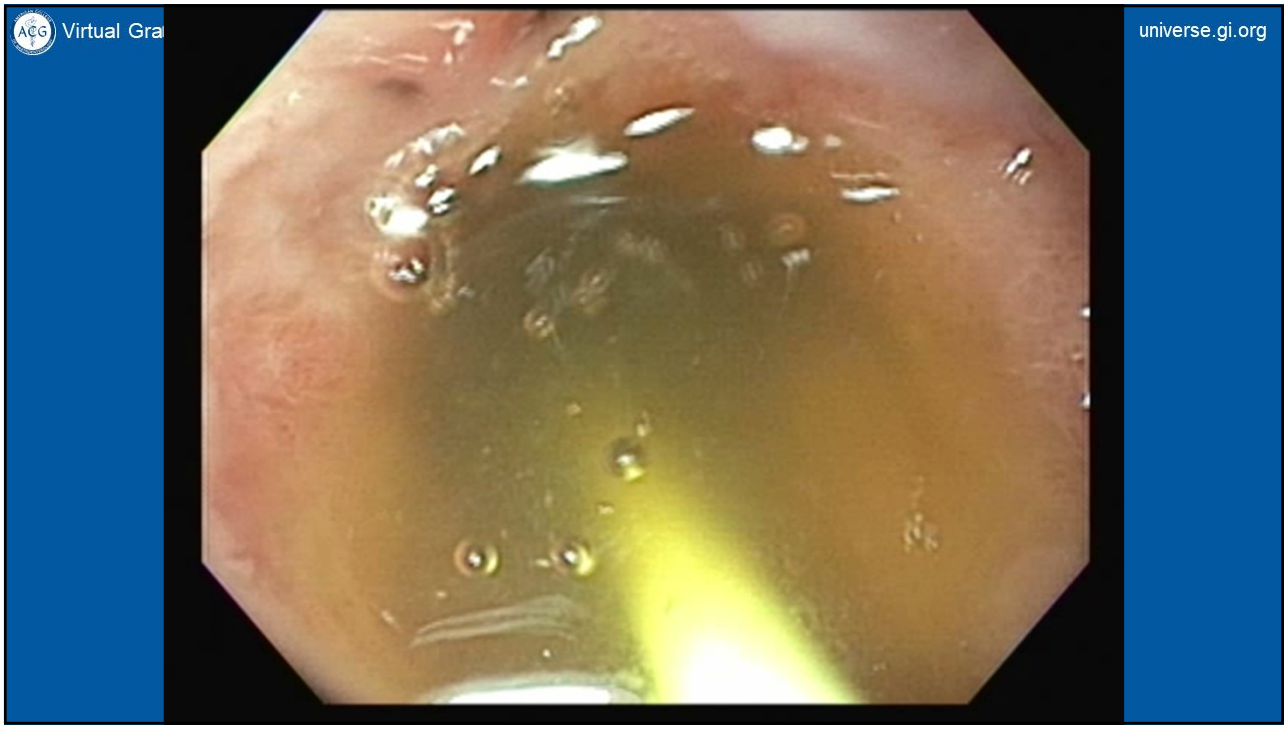

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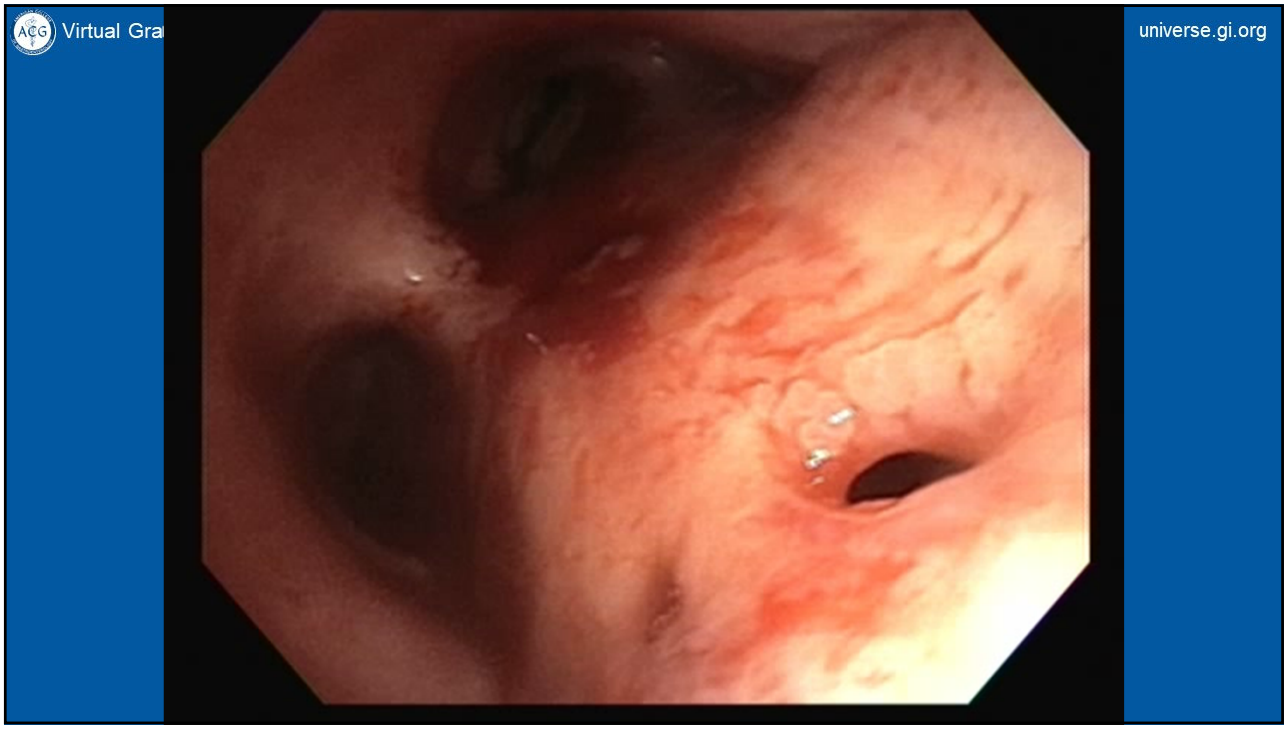

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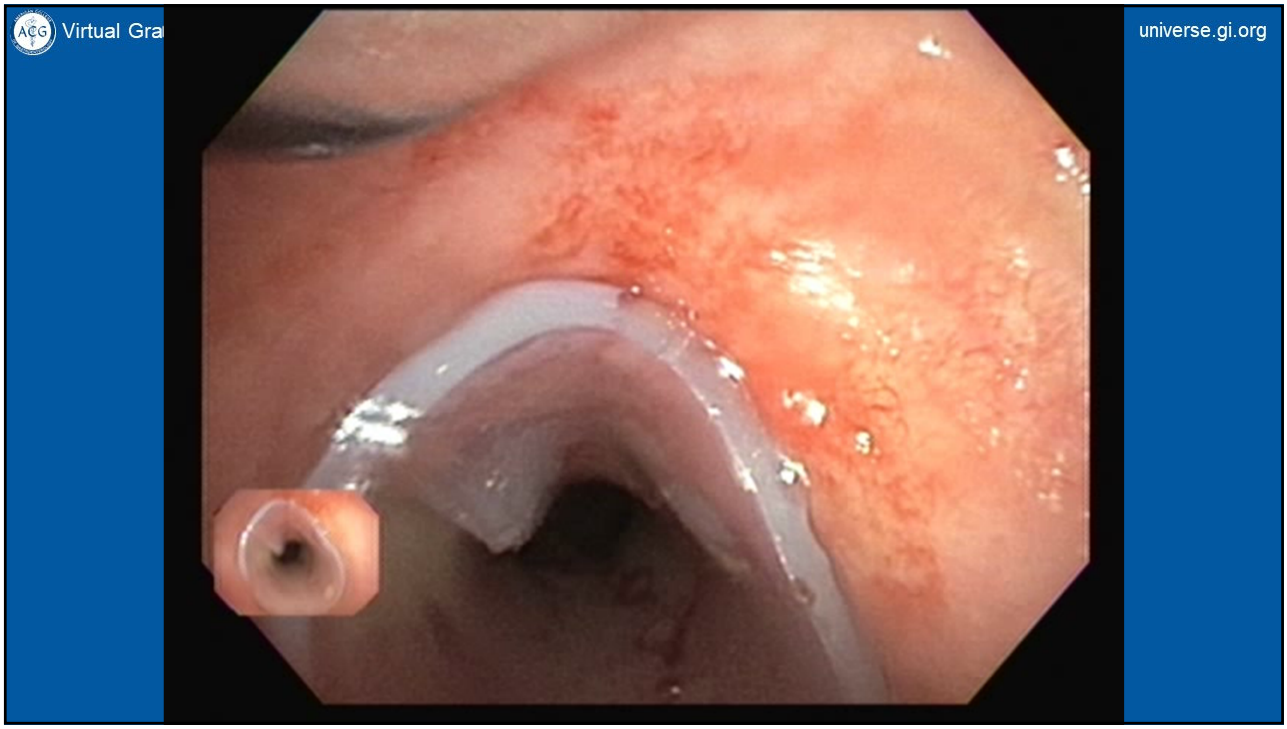

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STENTS FOR FISTULAS: OUR INSTITUTIONAL EXPERIENCE

- 14 patients with benign fistulas
  - 9 due to surgery
  - 1 due to endoscopic dilation of an esophageal stricture
  - 1 due to radiation therapy
  - 3 idiopathic
- Fistula closure using an esophageal stent was successful in 10/14 patients (71.4%)
- The mean number of treatment session with stenting was 1 (range 0-7)
- Six patients required re-stenting (6/14, 42.9%)
- Stent migration occurred in 3 patients (3/14, 21.4%)

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SOME FISTULAS CANNOT BE HELPED…

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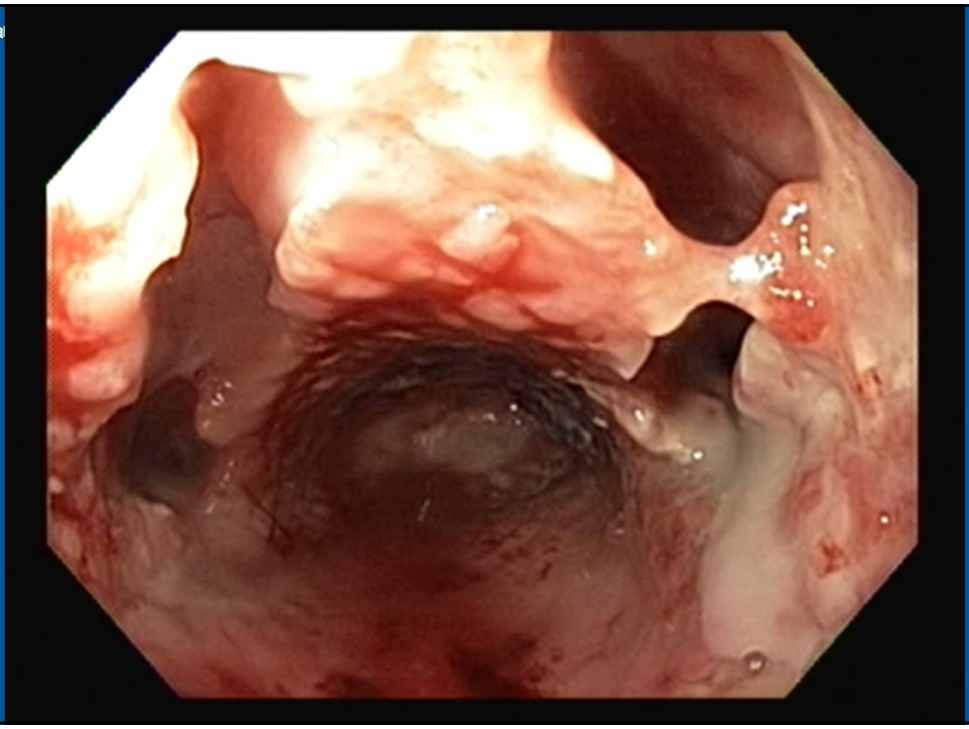

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PERFORATIONS

- Acute
  - Idiopathic (Boerhaave's)
  - Endoscopic
  - Other iatrogenic causes (NGT, TEE, etc.)
- Chronic
  - Usually post-surgical
    - Bariatric surgery
    - Esophagectomy

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PERFORATION: CLIPPING

- Idea: Achieve primary closure via endoscopic clipping
- TTS Clips
  - Usually do not achieve permanent closure
  - Can increase chance of success via inducing granulation
    - APC
    - Brushing
- Over-the-scope-clips
  - Larger
  - Deeper bite
  - Potentially full thickness closure

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PERFORATIONS: SUTURING

- Data still limited but encouraging
- Almost entirely single case reports or small case series
- Appears feasible
- Likely significant publication bias
- Suturing still performed on a limited basis in the community
- Perforations sometimes not a good substrate for suturing due to poor tissue cohesion

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PERFORATIONS: STENTING

- Concept: Food and swallowed secretions bypass the perforation and the perforation can heal secondarily
- If mediastinum not soiled, patient may not even need a drain
- If mediastinum soiled, radiology or CT surgery may need to place thoracic drains
- If possible, always better to treat sooner than later

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PERFORATIONS: STENTING

- Bakken et al, GIE 2010
  - 6/12 (50%) of esophageal perforations closed via SEMS
- Eloubeidi et al, GIE 2011
  - Clustered Perforations/Fistulas/Leaks together
  - 7/16 (44%) of patients treated successfully

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PERFORATIONS: OUR INSTITUTIONAL EXPERIENCE

- 10 patients:
  - 3 secondary to endoscopic dilation
  - 2 surgical complications
  - 2 perforations were due to food impaction
  - 1 spontaneous perforation due to EoE
  - 1 Boerhaave's syndrome
  - 1 patient perforated due to an esophageal tear caused by emergent Blakemore tube placement for an acute esophageal variceal bleeding episode.
- 10/10 (100%) were successfully closed with FCSEMS
  - 2 patients needed 2 rounds of stenting

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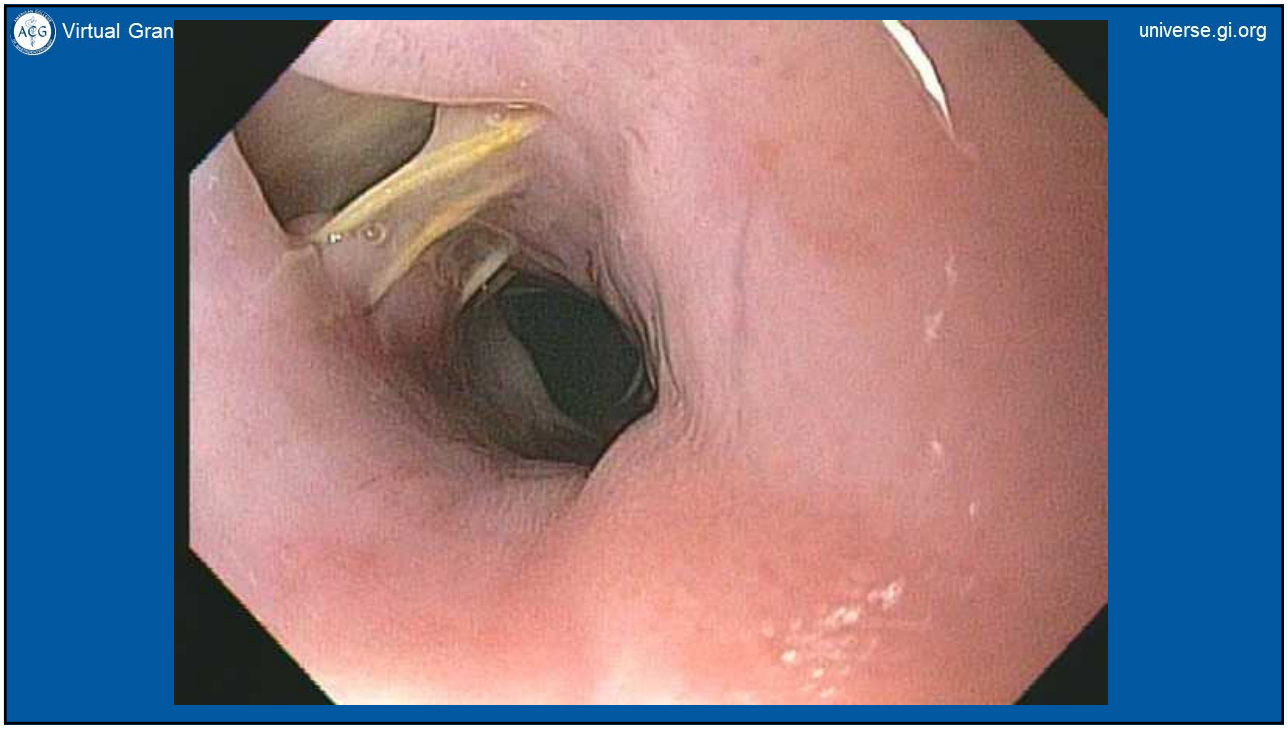
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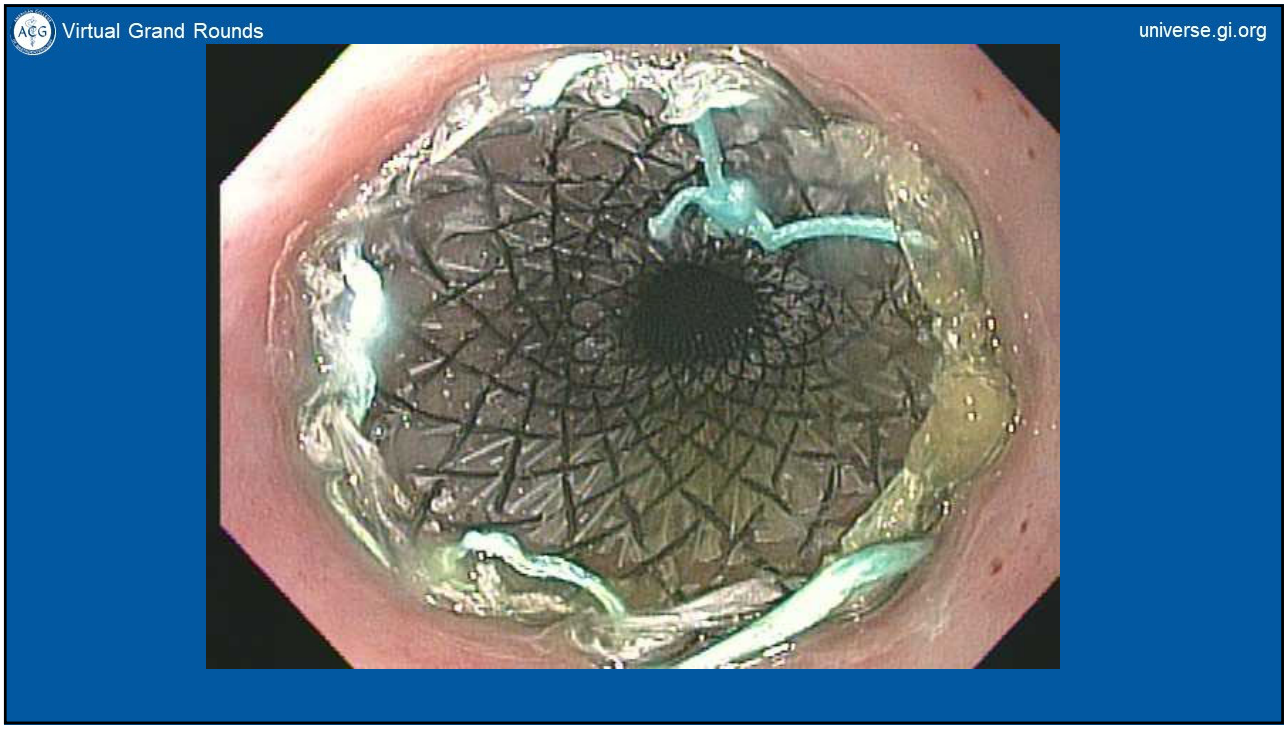
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8 WEEKS LATER…

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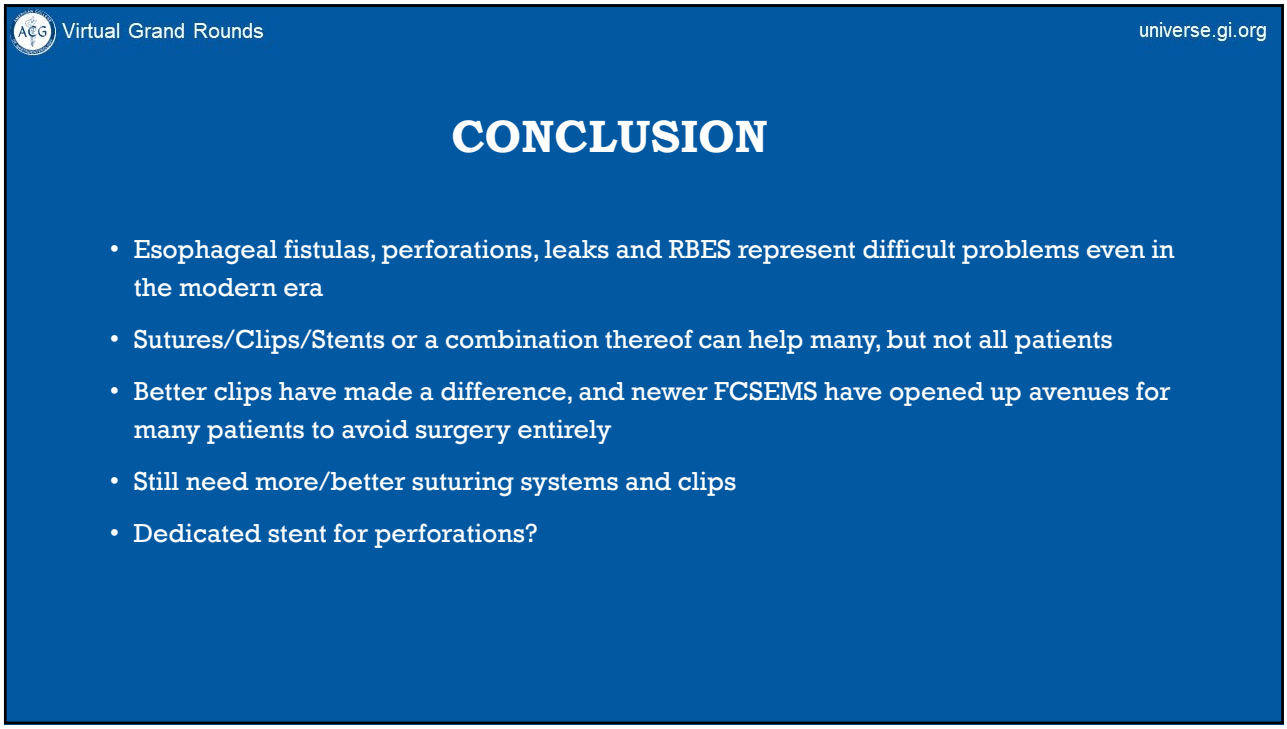
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CONCLUSION
• Esophageal fistulas, perforations, leaks and RBES represent difficult problems even in the modern era
• Sutures/Clips/Stents or a combination thereof can help many, but not all patients
• Better clips have made a difference, and newer FCSEMS have opened up avenues for many patients to avoid surgery entirely
• Still need more/better suturing systems and clips
• Dedicated stent for perforations?

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Questions?

Speaker:
Douglas G. Adler, MD, FACG

Moderator:
Ali A. Siddiqui, MD

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