
SCSG
2021 Post-DDW
Interventional Endoscopy Potpourri:
Not EUS/ERCP

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Disclosures

- Consultant for Boston Scientific
- Some techniques may involve off-label use

Overview: rapid fire potpourri

- Colon polyp EMR
- Bariatric Endoscopy
- Endoscopic anti reflux procedures
- Barrett's management
- G-POEM

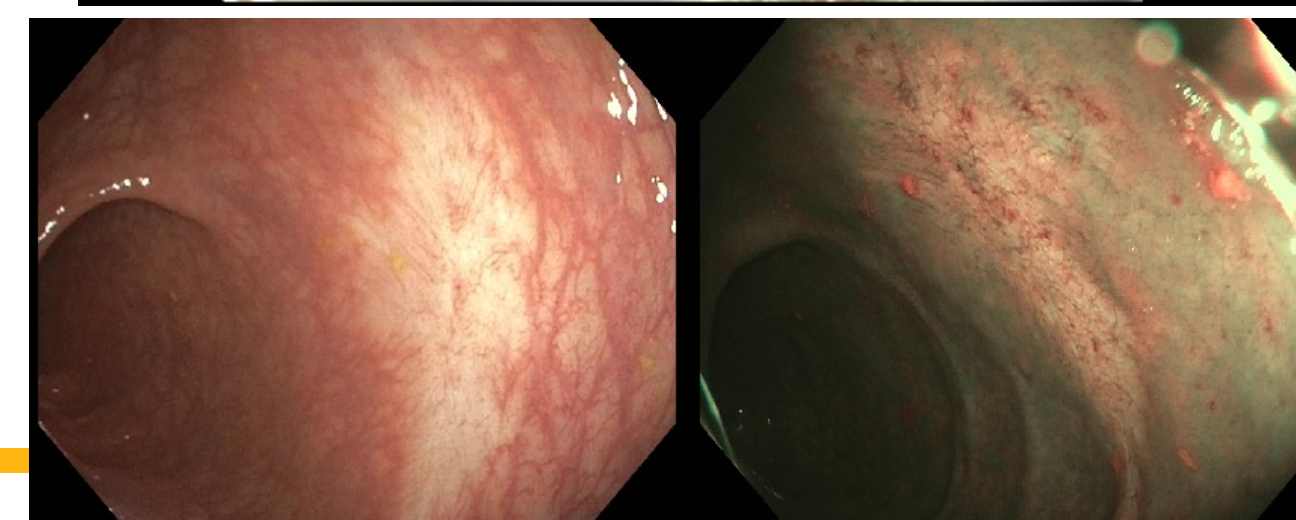
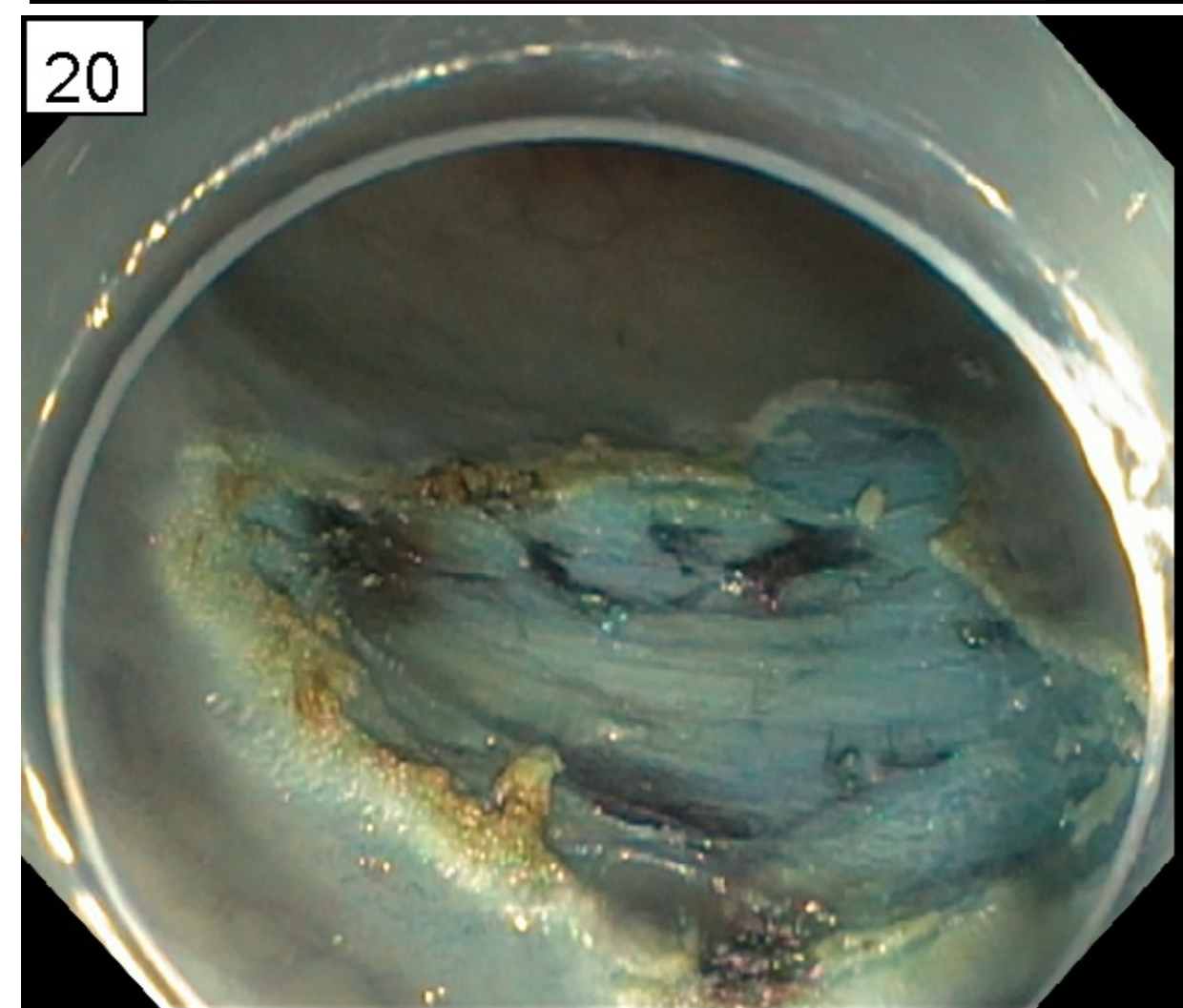
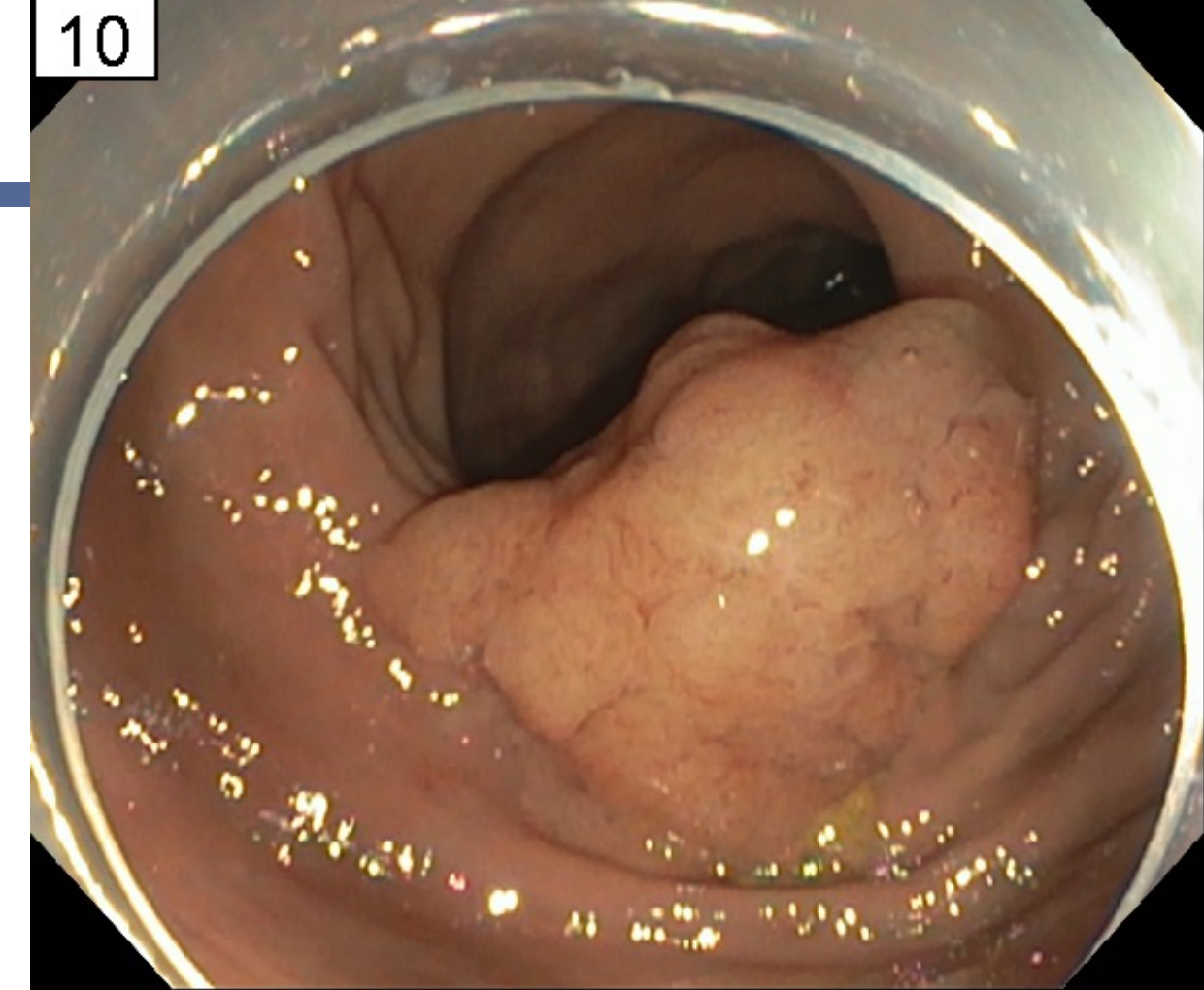


*leaving out a few things for time

Optimization of Colon Polyp EMR

Large colon polyp EMR

- Paradigm over the last 10-15 years of increasing primary role of endoscopic resection for almost all adenomas
 - larger lesions
 - difficult locations (IC valve, appendix, diverticulum, anal verge)
 - recurrent lesions
 - select T1 cancers
- Refinement of techniques to ensure eradication and safety
 - improved endoscopic visualization of margins
 - post EMR defect margin ablation
 - cold or hot avulsion of fibrotic areas
 - enhanced understanding of electrosurgical principles
 - recognition and management of complications (bleeding, perforation)



Always look for additional polyps

- Retrospective study of all referrals for EMR over 2 years
- n = 389
- 41 pts (10.5%) with 62 additional polyps
- 14/62 additional polyps were missed on index colonoscopy
 - corresponds to ~3% of all pts sent for EMR had missed polyp
 - avg size 16.8mm (+/-6mm)
 - all sessile
 - most right sided (71%) and adenomas (86%)
 - no missed cancer
- Conclusion: endoscopist being referred EMRs should be aware of additional large polyps that may have been missed



Modern EMR techniques are effective for difficult locations

- Retrospective analysis of EMR outcomes of historic vs contemporary cohort
- 2008-2016 vs 2016-2020
 - n = 142 IC valve non pedunculated polyps; median 35mm
- Clinical success: 93.9% vs 77.6% (p = 0.006)
- Recurrence 4.6% vs 21% (p = 0.019)
- Conclude: modern EMR technique results in improved outcome and avoiding surgery even in challenging anatomic location



Prophylactic post EMR clipping

- Delayed bleeding is the most common adverse event
- Some evidence of reduced delayed bleeding
- Routine use controversial (cost) with discordant results
- Most consider prophylactic clipping in high risk
 - Anti-coag/plt Rx
 - R sided
 - >20mm
 - Visible vessels
 - Older patients
 - Intraprocedural bleeding
 - Hot (vs cold) resection

RCT of Prophylactic Clipping post EMR: Justified in the Right colon?

- Single center RCT all right colon non-pedunculated polyps >20mm
- 2016-2020, 1:1 clip vs control
- n = 231
- Clinically significant bleeding lower in clip group
 - 3.4% vs 10.6% (p = 0.04, ITT)
 - ARR 7.2%
 - NNT 13.9
 - Median 5 clips; not all had complete closure
 - Largest benefit seen in 20-39mm and cecum



Subgroup from RCT of prophylactic post EMR clipping:
Serrated polyps don't need clips?

- multicenter international RCT of nonpedunculated polyps >2cm
- Parent RCT showed benefit (Pohl et al, Gastro 2019)
 - n=919 pts
 - right sided lesions 3.3% vs 9.6% bleeding
- subset analysis of serrated lesions
- n = 195 pts, 220 serrated polyps
- median size 25mm
- no difference in bleeding rates clip (4.2%) vs control (3%)



Take home points: Colon polyp management

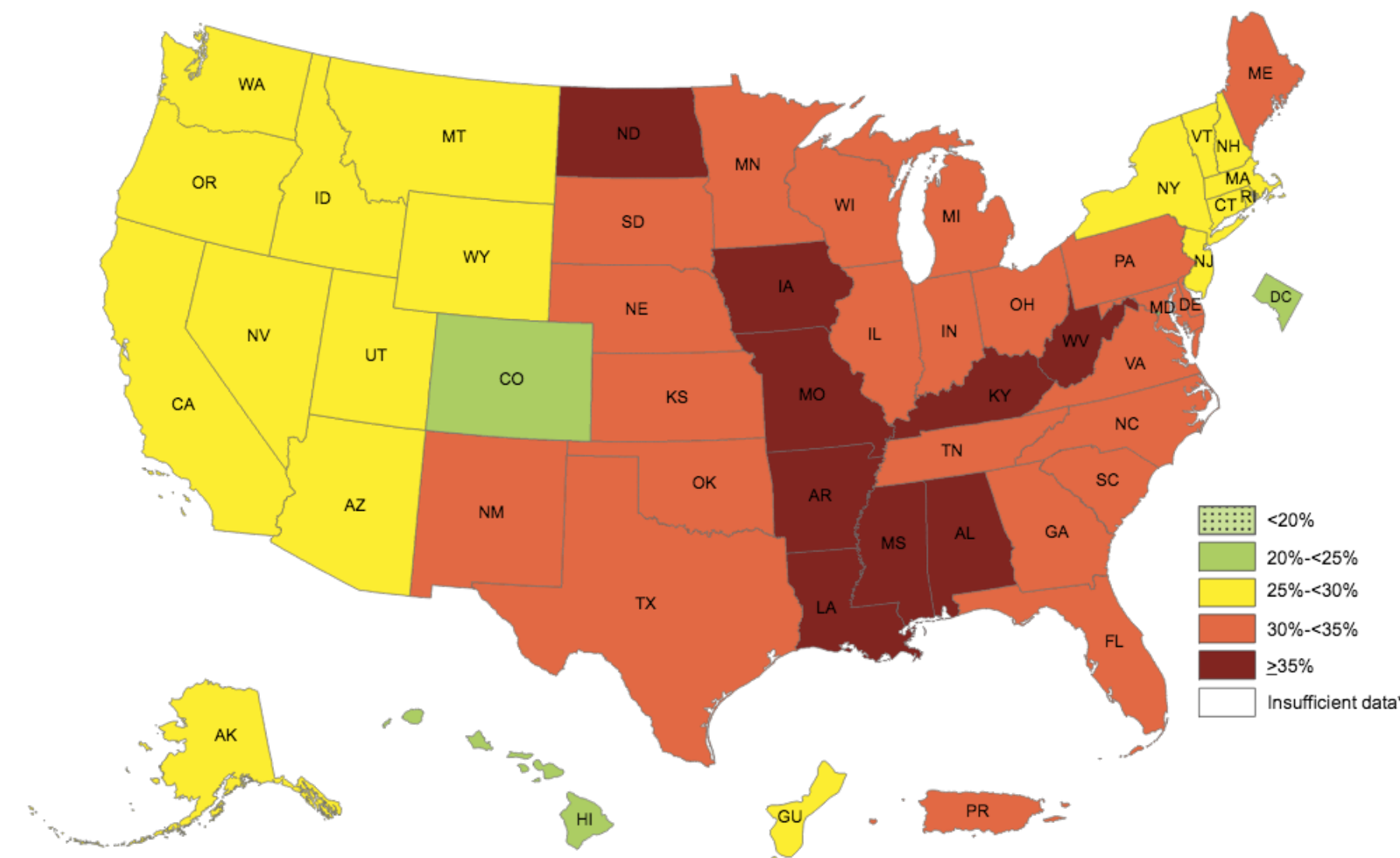
- Consider prophylactic clipping after hot EMR for
 - >20mm
 - right sided
 - adenomas (non-serrated)
- Careful evaluation of the right colon (even if the indication is EMR of a known lesion) is worthwhile to detect synchronous lesions (cap, retroflexion, etc.)
- Modern EMR techniques are maturing: almost all polyps can be managed endoscopically; refer to endoscopy before surgery (even if you think its hard)

Bariatric endoscopy:

New techniques and confirmation of use of
endoscopic revision for both surgical bypass and
sleeve gastropasty weight regain

The cost of obesity

- CAD, stroke, DM, malignancy, NASH/cirrhosis
- Almost any measure of health related outcome worse with obesity
- \$147 billion annual cost (2008)

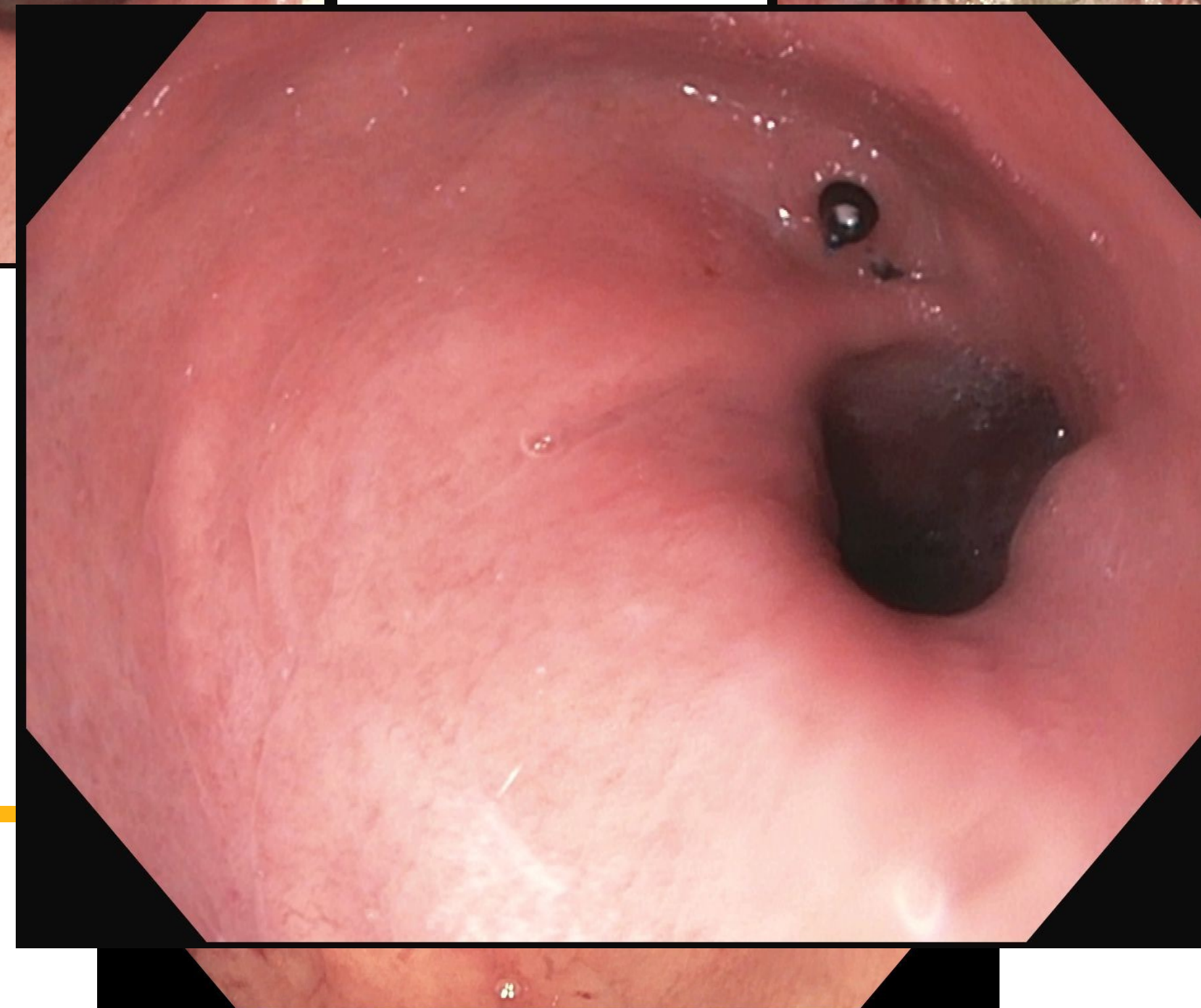
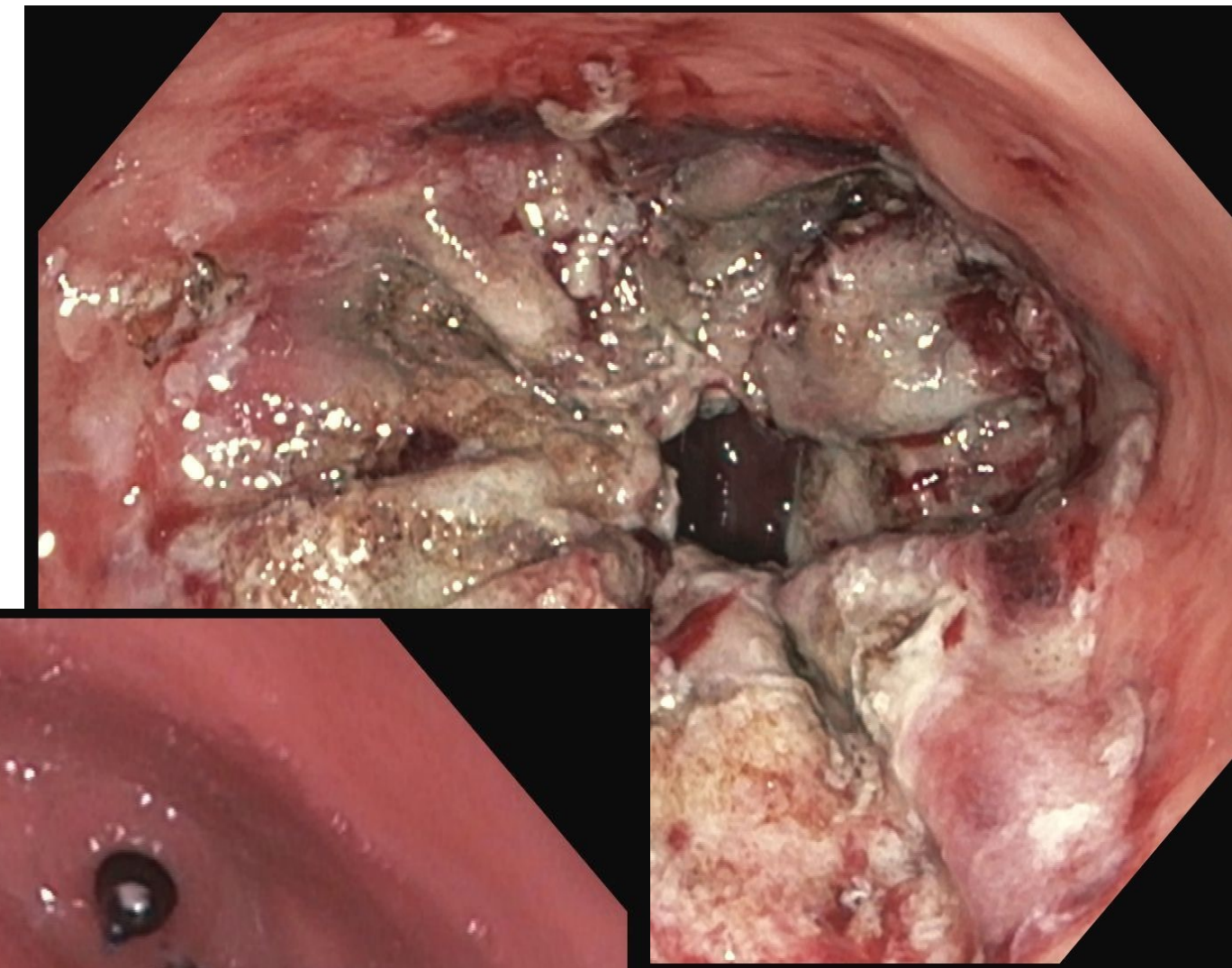
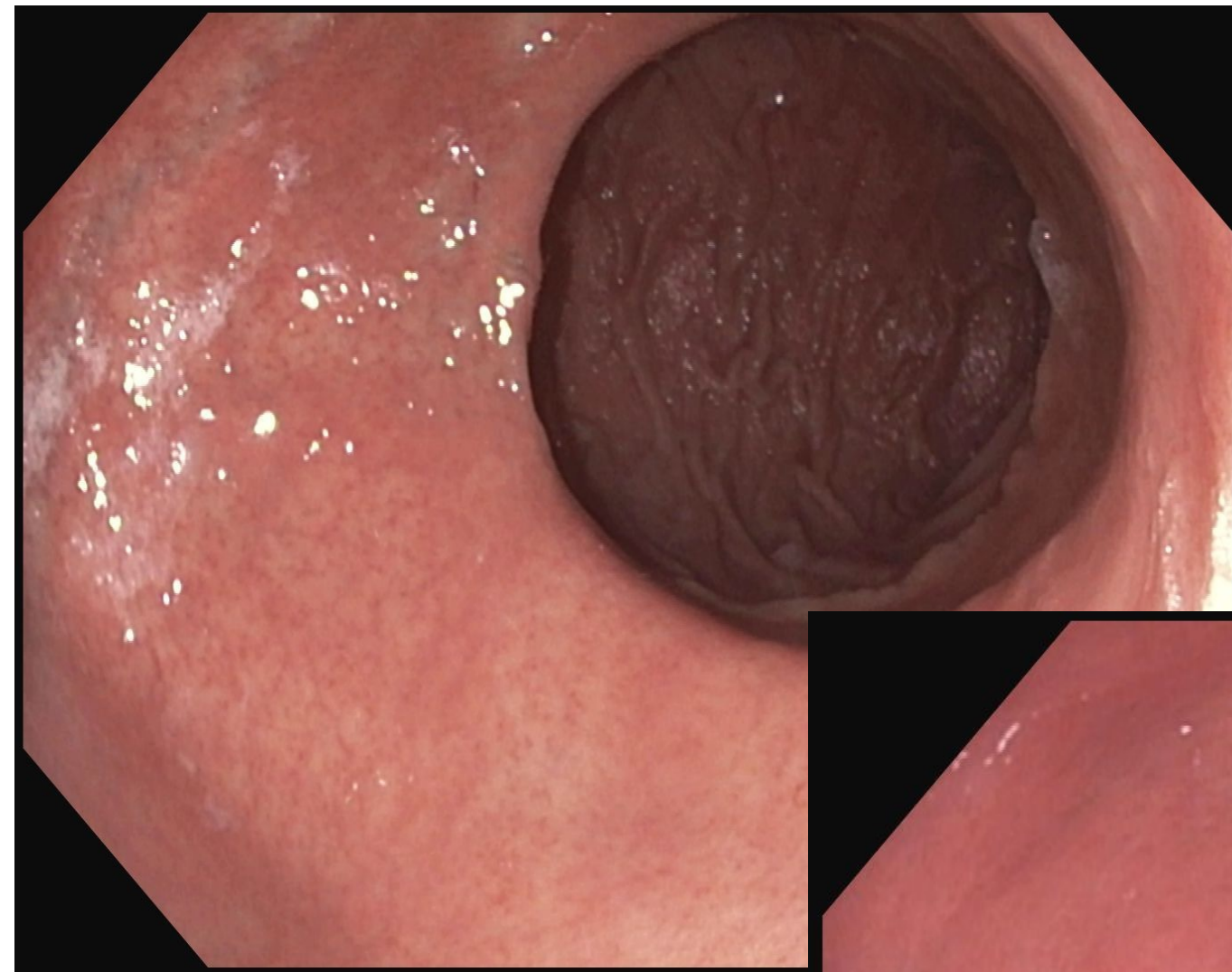


Bariatric Endoscopy

- Management of weight re-gain
- Primary therapy
- Management of surgical complications
- Medical management increasingly utilizes pharmacotherapy in addition to lifestyle modifications and in combination with bariatric procedures

Transoral Outlet Reduction (TORe)

20-30% gain weight at 10 yrs post RYGB
1/3 regain almost entire weight
TORe - 8.8% TWL at 5 years



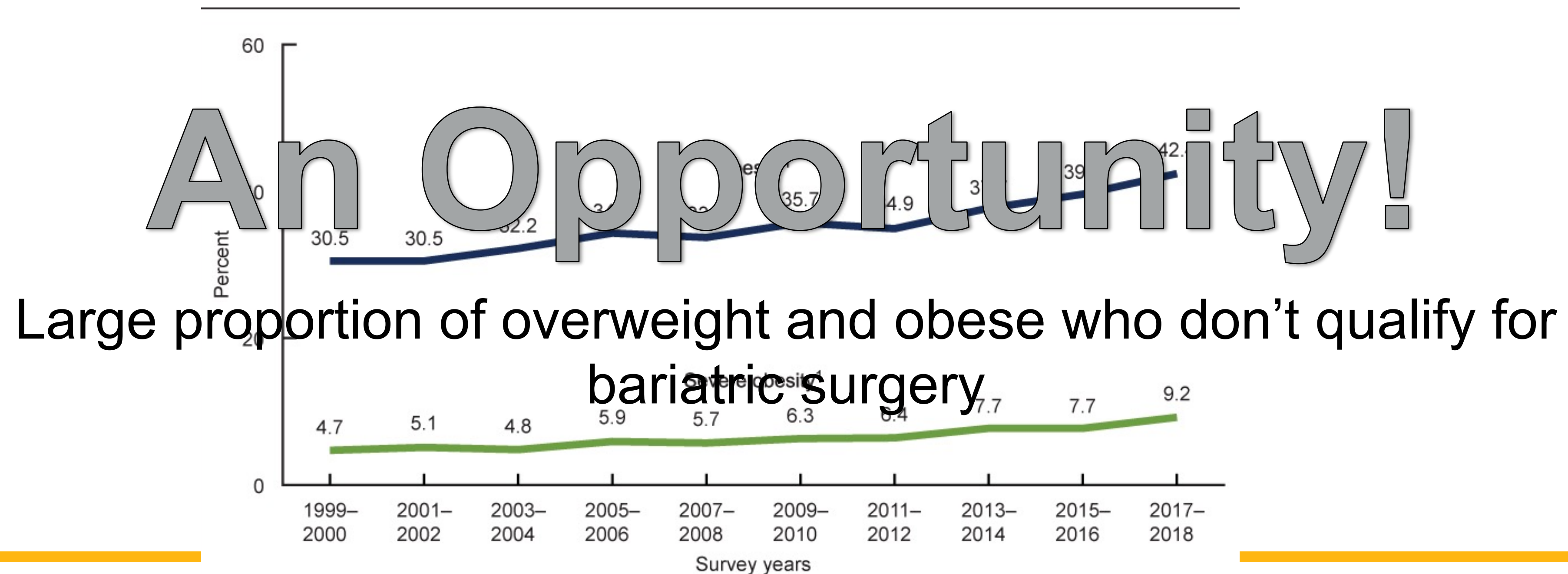
Endoscopic RYGB revision (TORe) is safer and is as good as surgery at 5 years for weight regain

- Retrospective matched cohort post RYGB
- Endoscopic vs surgery revision for weight regain and GJA > 12mm
- n = 122 RYGB with dilated GJ anastomosis
- 5yr f/u data: 53 endo, 28 surgery group
- SAE higher in surgery (26.2% vs 4.9%, p=0.002)
 - leak, intra-abd infection, wound infection, ulcer, severe pain, SBO, pancreas injury, PE, bleeding
- Surgery had greater weight loss at 1 year (but equivalent at 3 and 5 years)



Obesity: Utilization of Bariatric Surgery

- ~40% of US population is obese, ~70% is overweight (including obese)
- Bariatric surgery ~200K-250K per year
- ~1% of eligible obese undergo bariatric surgery

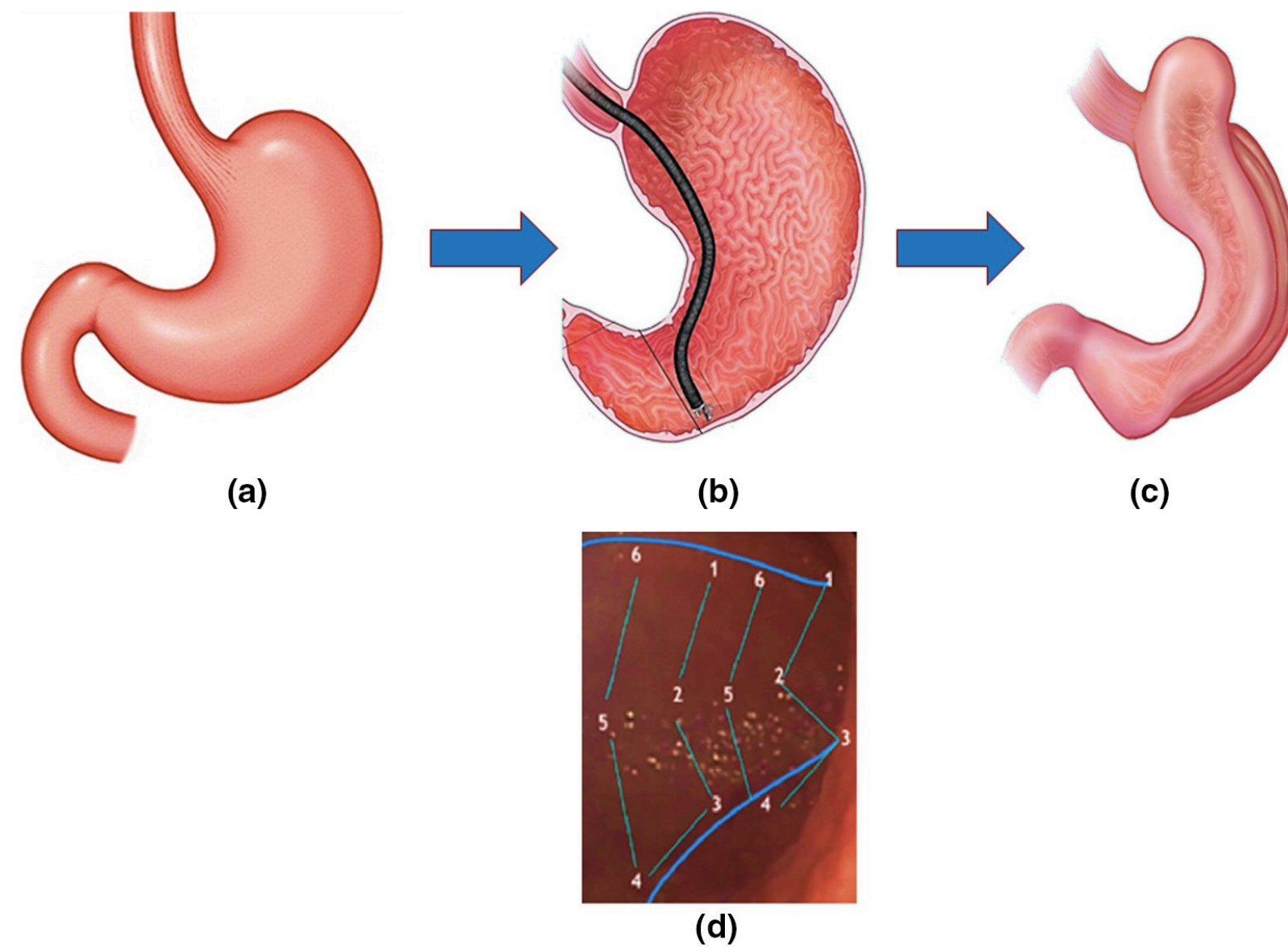


The Menu of Primary Endoscopic Bariatrics

- Endoscopic gastric reduction/restriction (ESG, POSE)
- Intagastric balloons
- Aspiration therapy
- Duodenal sleeve
- Duodenal resurfacing
- Others, investigational



Intragastic plications: Endoscopic Sleeve Gastrectomy (ESG)



- Int'l Multicenter, 2013-2015
- 248 patients, retrospective
- BMI 37.8 +/- 5.6
- **24 months, total body weight loss: 18.6%**
- 2% (n=5) serious AE
 - 2 perigastric fluid collection: perc drain, abx
 - 1 extragastric bleed: transfusion
 - 1 PE, POD3
 - 1 pneumoperitoneum + pneumothorax: chest tube

ESG inception: Endoscopic revision of weight regain after primary endoscopic bariatric intervention is effective

- Retrospective analysis of 275 ESGs who had Rx or re-ESG for weight regain or weight loss plateau
- Medication, n = 55 vs re-ESG, n = 24
- Pharmacotherapy patients were more noncompliant with followup (67% vs 35%)
- ESG with more TBWL by ~7%

Efficacy of Endoscopic Revision vs Pharmacotherapy for Management of Weight Regain After Endoscopic Sleeve Gastroplasty. Hajifathalian K, Sharaiha RZ, et al

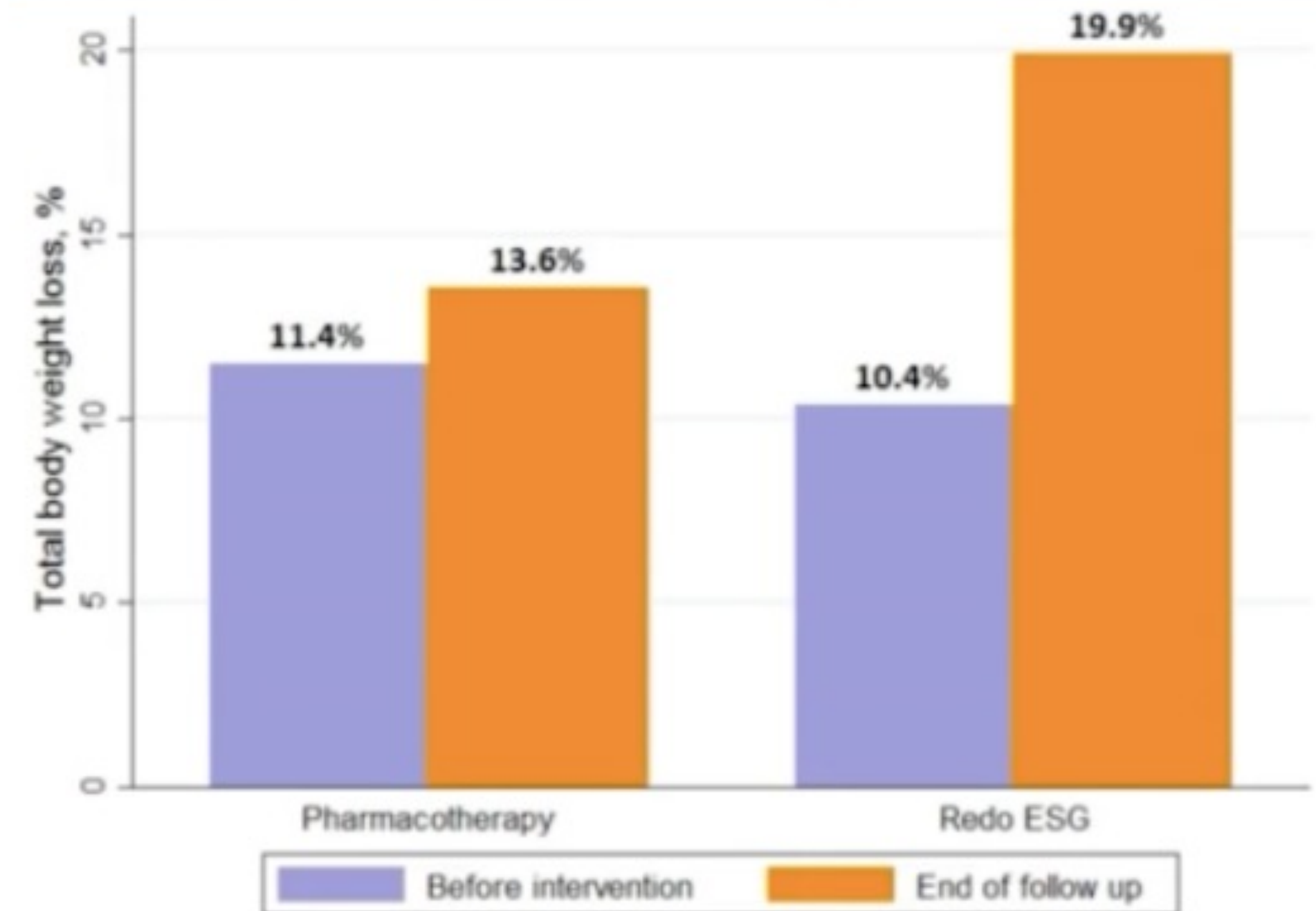
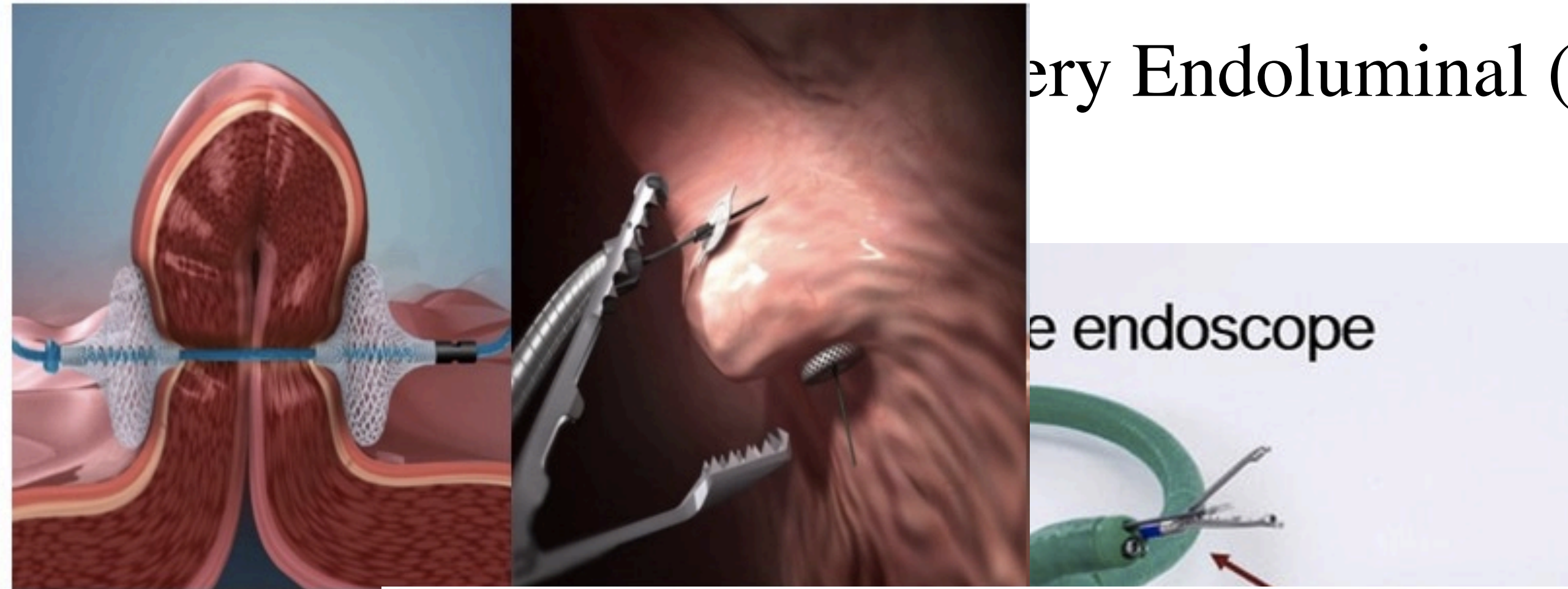
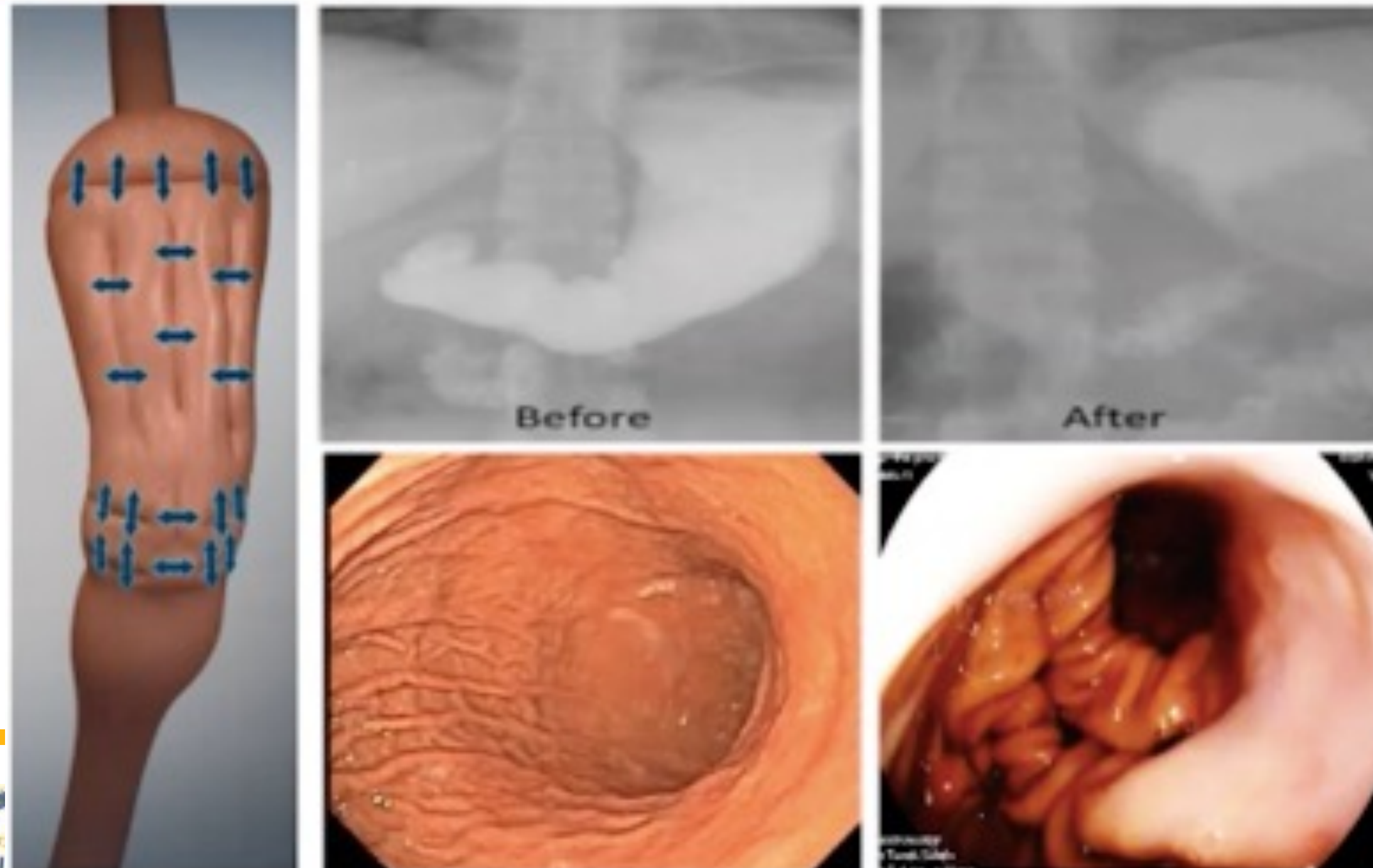
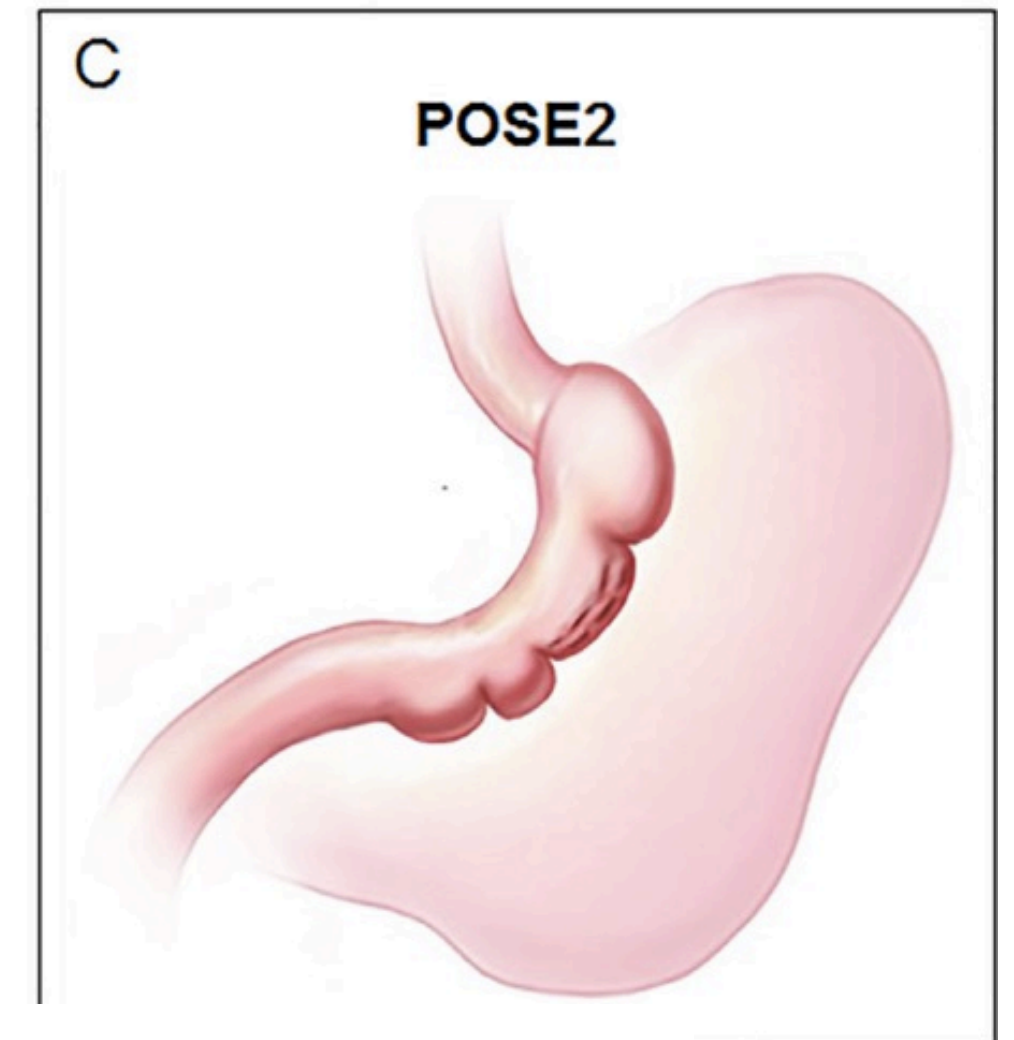
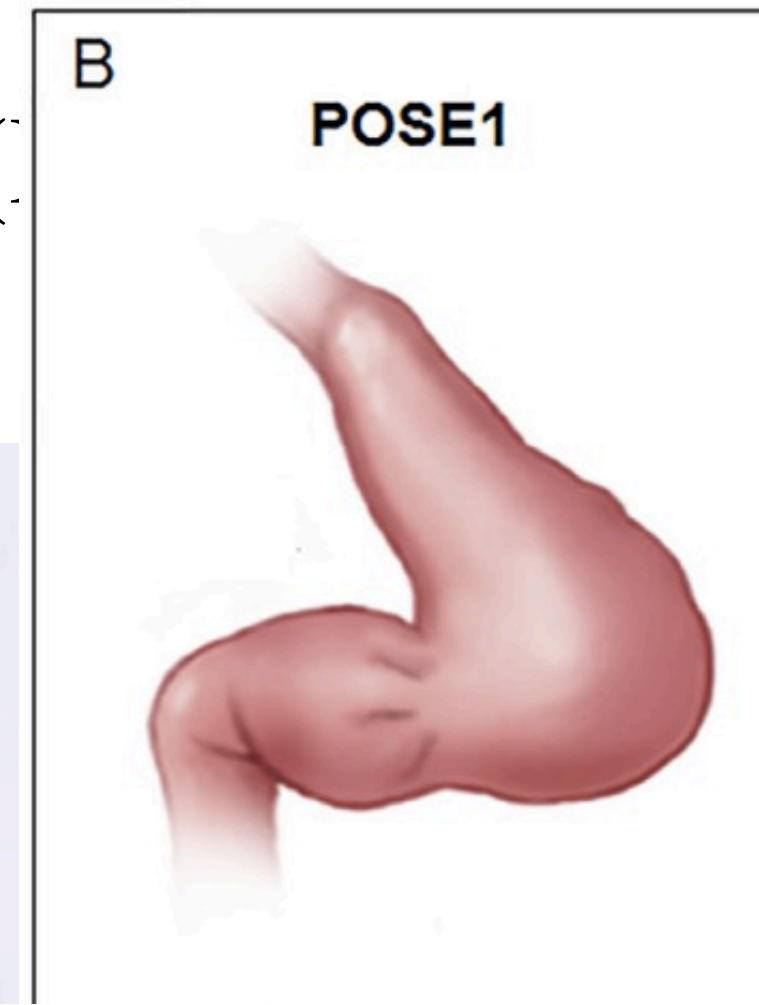


Figure 1. Improvement in Total body weight loss (TBWL%) after initiation of pharmacotherapy versus redo ESG (9.5±7% versus 2.2±9%, difference 7.3%, 95%CI 3.5-12.1%, p=0.001).





ery Endoluminal (



An International Experience of a Dedicated Primary Bariatric Endoscopic Plication Device: Durable, Efficacious, and Safe

- Int'l prospective multi-center of 44 pts BMI ~37
- FDA Investigational Device Exemption (IDE)
- Procedure time 37 min +/- 11 min; ~19 anchors
- TBWL 16% at 12 months and 12% at 24 months
- no SAE
- Improvement of satiety scores, cholesterol, ALT, QOL, and steatosis scores
- All plications in situ at 12 months



Take home points: Bariatric endoscopy

- Endoscopic revision of RYGB weight regain is preferred 1st line
- Endoscopic revision of ESG is feasible and effective; further adds to appeal of primary endoscopic option
- POSE is a dedicated primary endoscopic platform with good safety, efficacy, durability at 2 years; role vs ESG to be determined

Endoscopy for GERD:

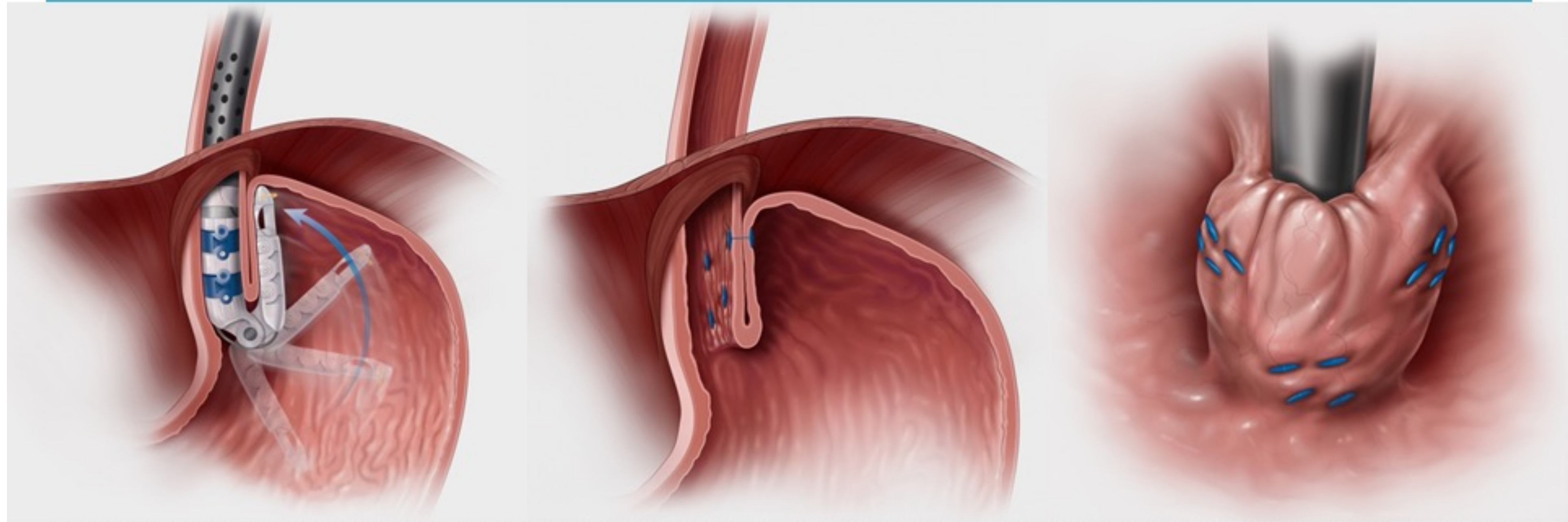
Refinement of techniques and more experience in
different patient scenarios



Why endoscopic therapy for GERD?

- GERD is common
- Current medical and surgical treatment are pretty good but not ideal
- There is a potential for an endoscopic technology to fill a niche
- However, multiple prior studies with variable/heterogenous objective reduction in acid exposure, though with good symptom control

TIF Procedure Overview



©2015 AGA Institute. Hunter JG, et al. Gastroenterology. 2015 Feb;148(1):325.

STEP 1

The [REDACTED] device is inserted into the esophagus through the mouth and is positioned at the junction of the stomach and esophagus. A small hiatal hernia is reduced by engaging suction (invaginator) and positioning the esophagus below the diaphragm.

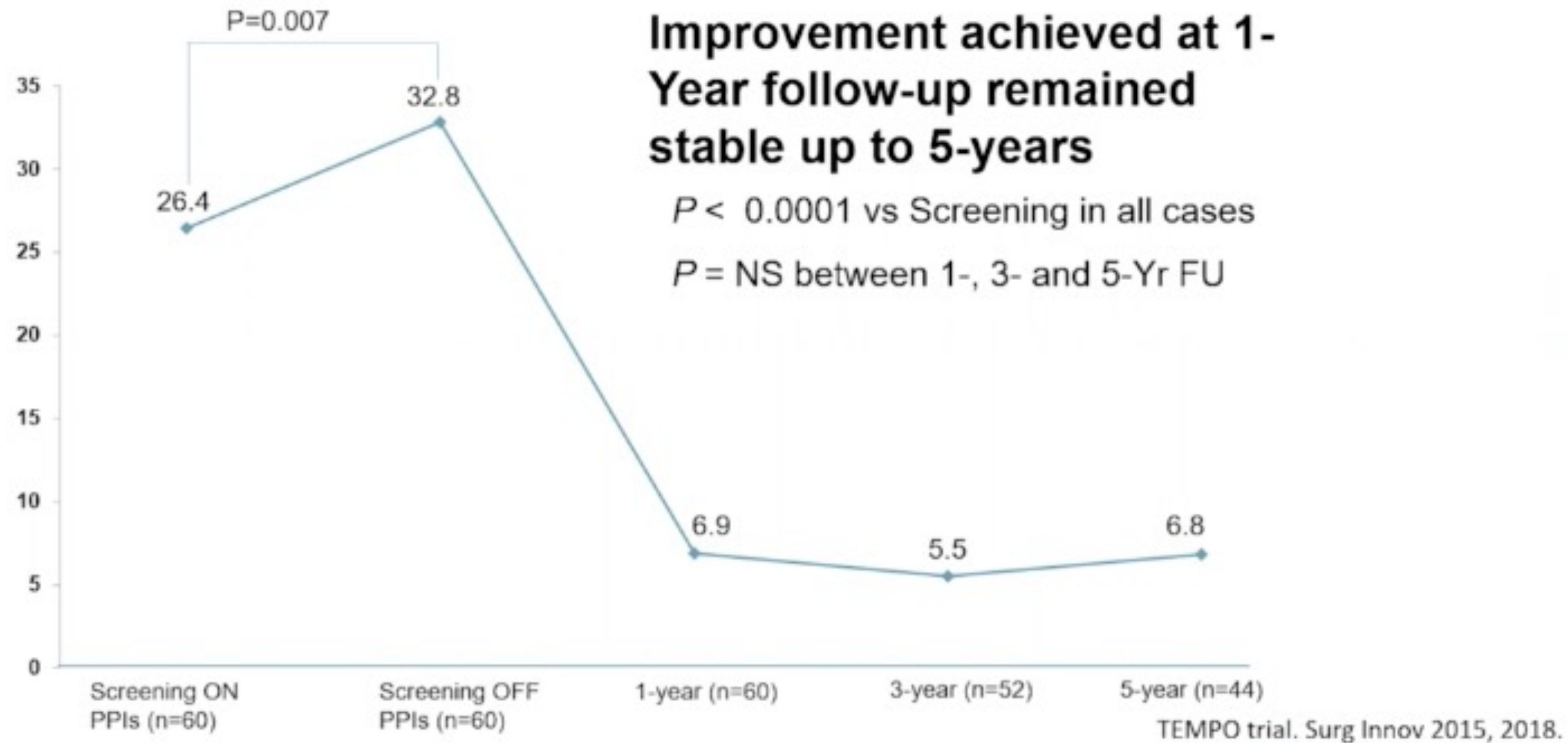
STEP 2

A full thickness tissue fold at the gastroesophageal junction is retracted, wrapped and anchored using [REDACTED] implantable fasteners—equivalent to 3.0 sutures—which are delivered across the tissue to complete the plication.

STEP 3

The valve is extended and multiple fasteners (12-20) are delivered with a single device insertion. The TIF procedure reconstructs the primary components of the antireflux barrier, creating a tight 3-5 cm valve enveloping the distal esophagus below the diaphragm.

TEMPO Follow up data 3 yr and 5 yr



GERD Health Related Quality of Life at screening, 1-, 3-, 5-year followup



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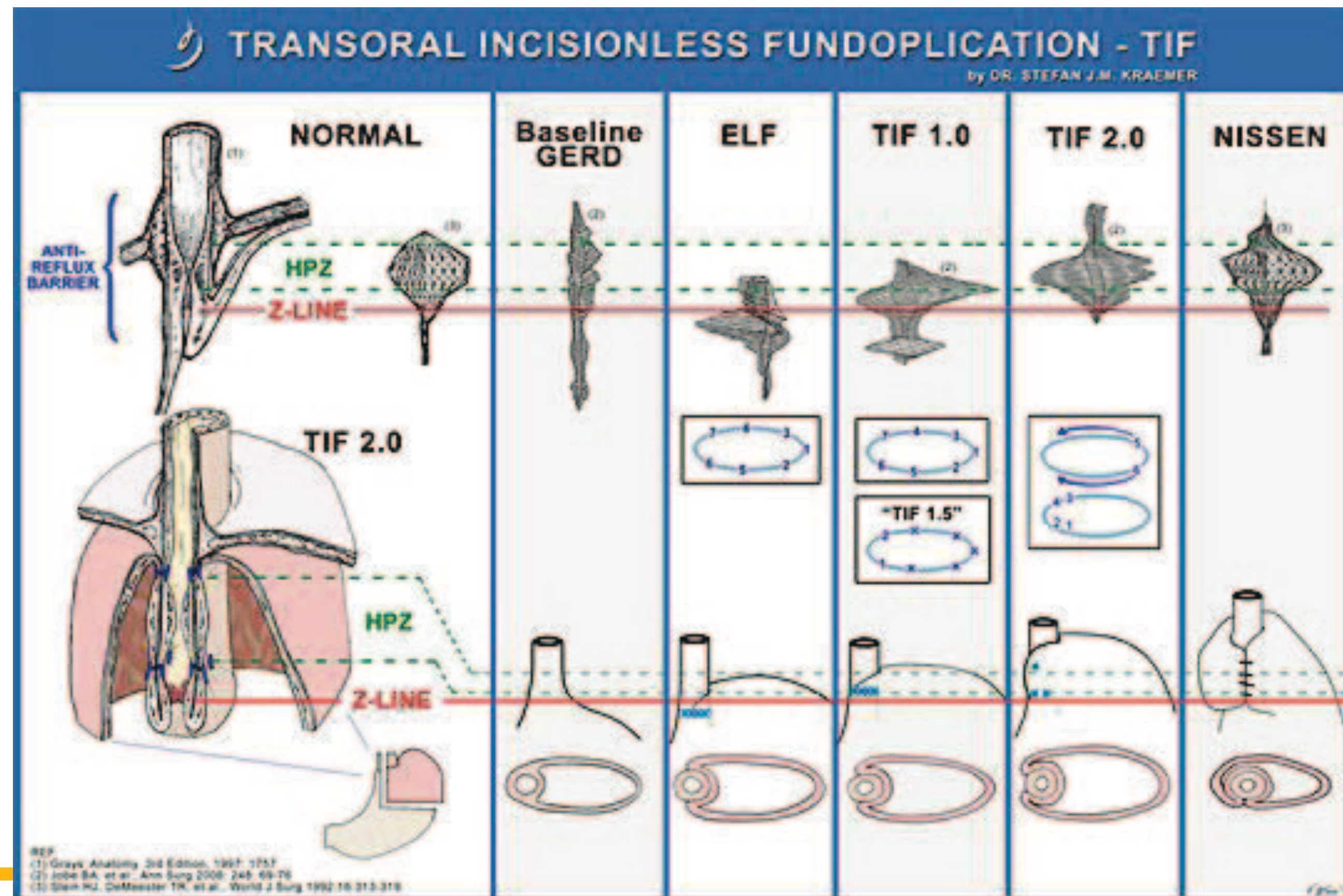
Trad et al, Surg Innov 2015

Trad et al, Surg Endosc 2017

Trad et al, Surg Innov 2018

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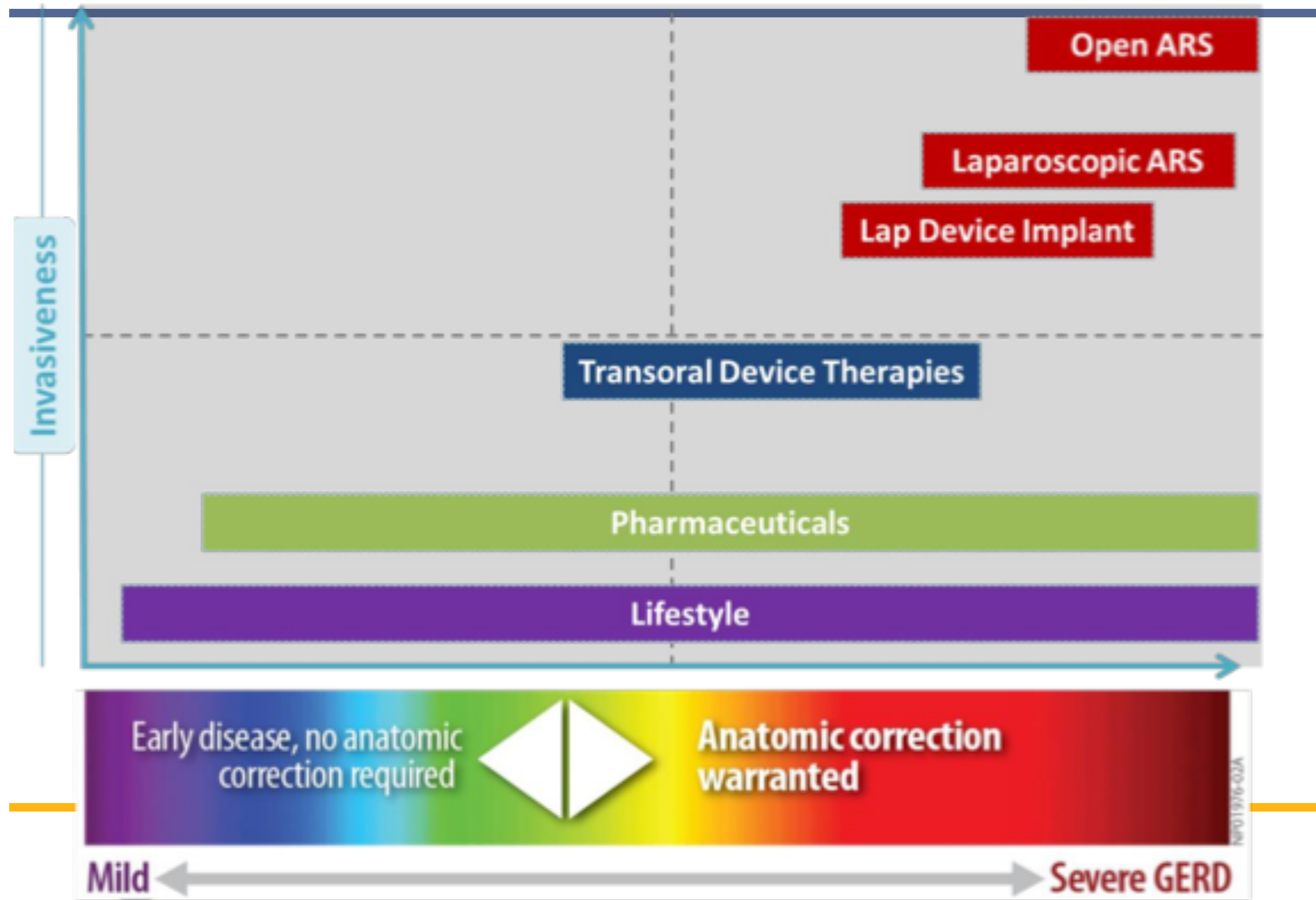
TIF is the most widely used EARP and it has evolved
prior studies with variable/heterogenous objective reduction in acid
exposure, though with good symptom control



Modern and aggressive TIF technique is safe and effective in the short term

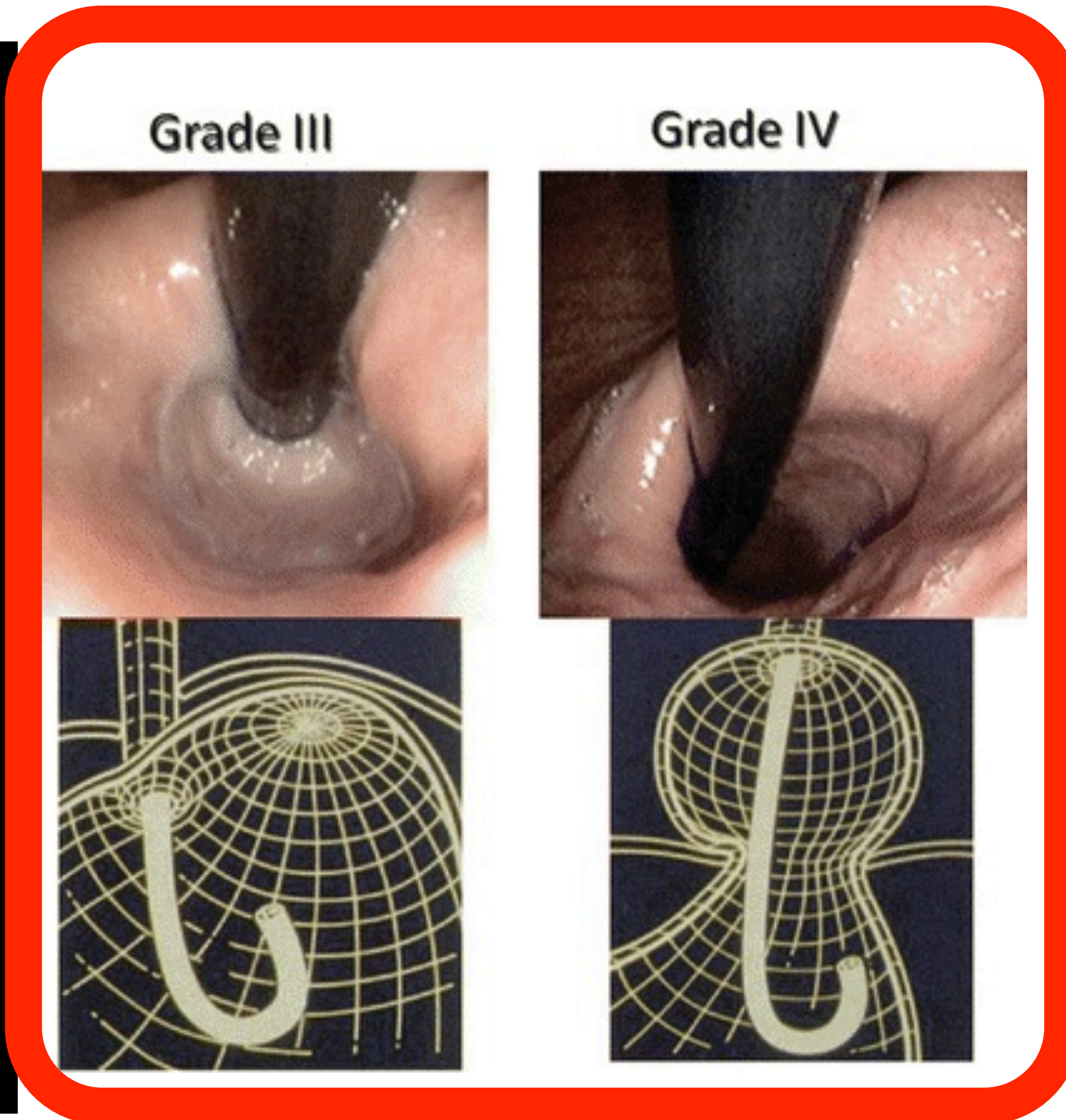
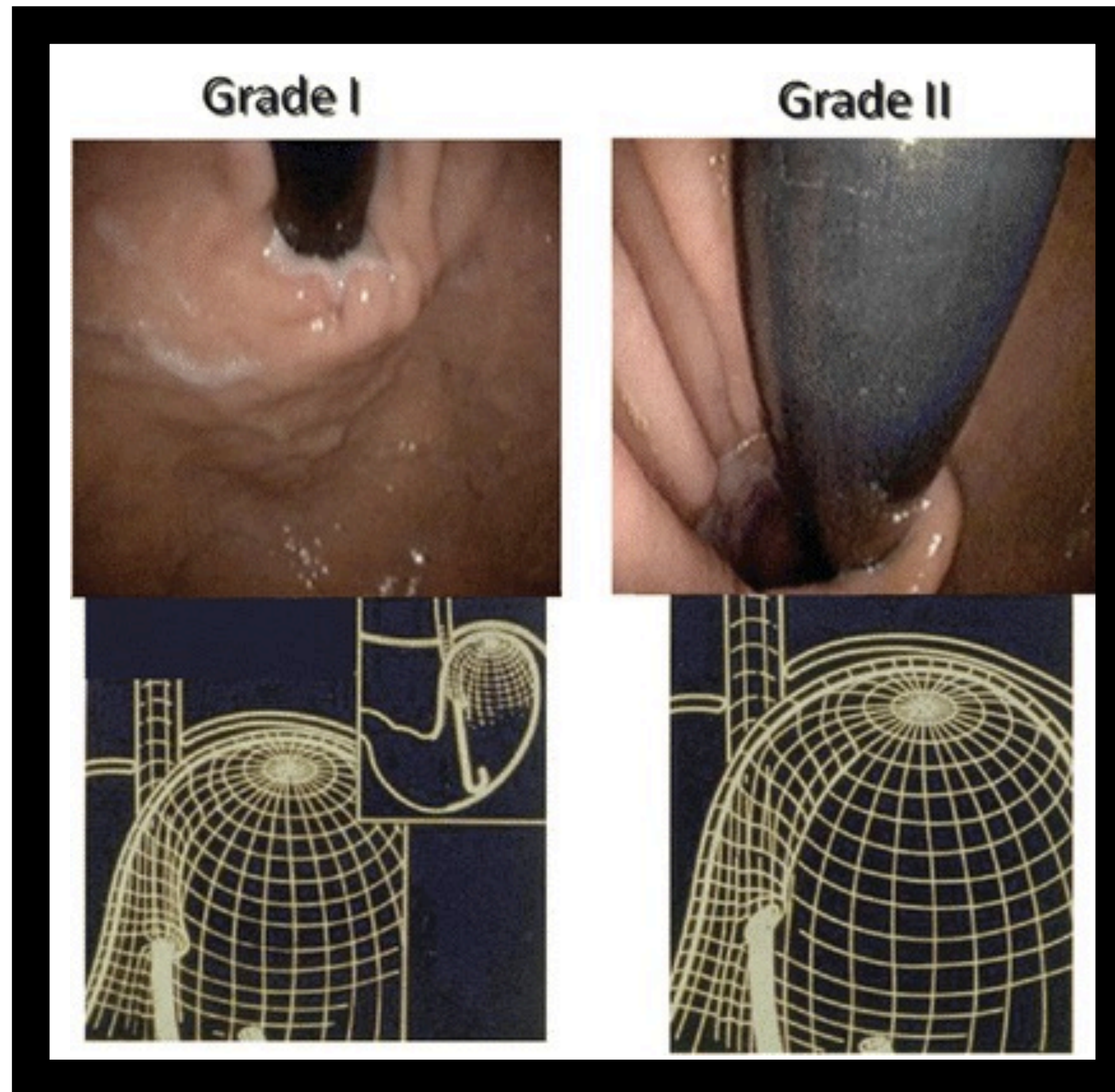
- Registry, multicenter; ongoing
- Enhanced technique with latest device
 - 300 deg
 - 30 fasteners
 - 3cm vertical valve
- 70 pts, mean followup 13 months
- 92% improved symptoms (~70% improvement of mean GERD-HQRL scores)
- 42 pts with post TIF pH data: normalized in 74%; if able to achieve >270deg wrap ==> 84%
- 83% off all PPI, 94% satisfied with symptom control
- no SAE





TIF!!!

HH Repair + ???



C-TIF: gaining acceptance and experience

- 34 pts, HH >2cm (mean 3cm, largest 8cm), Hill grade >3
- mean followup ~6 months
- Improved GERD control by 48h pHmetry postTIF (14pts)
 - 91% decrease acid exposure (13pts normalized)
 - 92% decrease Demeester score
- 88% off PPI at 12 months
- Improved mean GERD-HRQL scores 68% 12 months
- Improved regurgitation 100% 12 months



TIF to revise prior reflux surgery

- 11 centers, TIF for recurrent GERD symptoms and +pH or C/D esophagitis and no or small hernia post lap fund
- 20 patients (19 Nissen, 1 Toupet), f/u 12 months; median 4 years post surgery
- 100% technical success
- Improved subjective scores
 - GERD-HRQL 24.3 to 14.8
 - RSI 14 to 9
- 42% discontinued PPI
- 9 pts had post TIF pH testing; all had normalization
- no SAE



Take home points: TIF

- Modern TIF technique is safe and effective with perhaps better objective acid control compared to historic iterations; improvement of durability over prior techniques TBD. If durable pH control can be demonstrated, this will be a significant step
- C-TIF is emerging as a tool in the spectrum of GERD patients with hiatal hernia to optimize risks/benefits of available interventions; long term and comparative studies are needed
- TIF is feasible and safe after prior surgical fundoplication; this is a difficult patient population. Durability data needed and approach to recurrence after both surgical and endoscopic anti-reflux procedures will be important

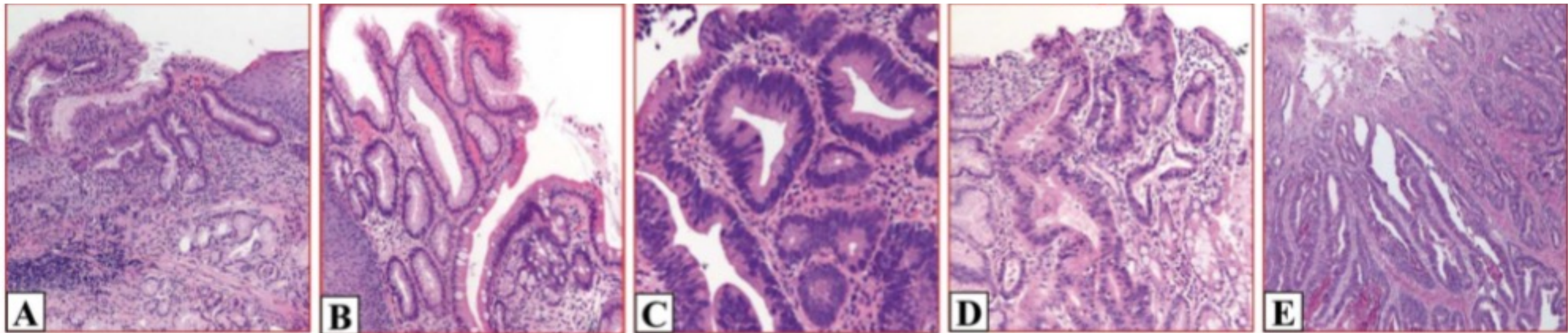
Barrett's esophagus and early esophageal adenocarcinoma:

Pushing endoscopically curable cancer criteria
and expanding roles of other ablation and
resection techniques

From GERD to Esophageal Cancer

1.7 to 13.6%*

***LGD to HGD/EAC
9-13% if expert path
review to confirm
LGD!**



A. Mucosa of gastroesophageal junction with esophagitis

B. BE without dysplasia

C. BE with low-grade dysplasia

D. BE with high-grade dysplasia

E. Adenocarcinoma

6-19%



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Conteduca et al. Int. J. Oncol. 2012
Wani et al, Am Journal of Gastro, 2009
Shaheen et al, NEJM, 2009

UCLA Health

Endoscopic Eradication Therapies (EET)

- Resection - Absence of SM invasion
 - **Endoscopic mucosal resection (EMR)***
 - Endoscopic submucosal dissection (ESD)
- Ablation
 - **Radiofrequency ablation (RFA)***
 - Hybrid APC
 - Cryoablation
 - Cryoballoon

***Ample efficacy data
for complete
eradication of IM and
dysplasia**



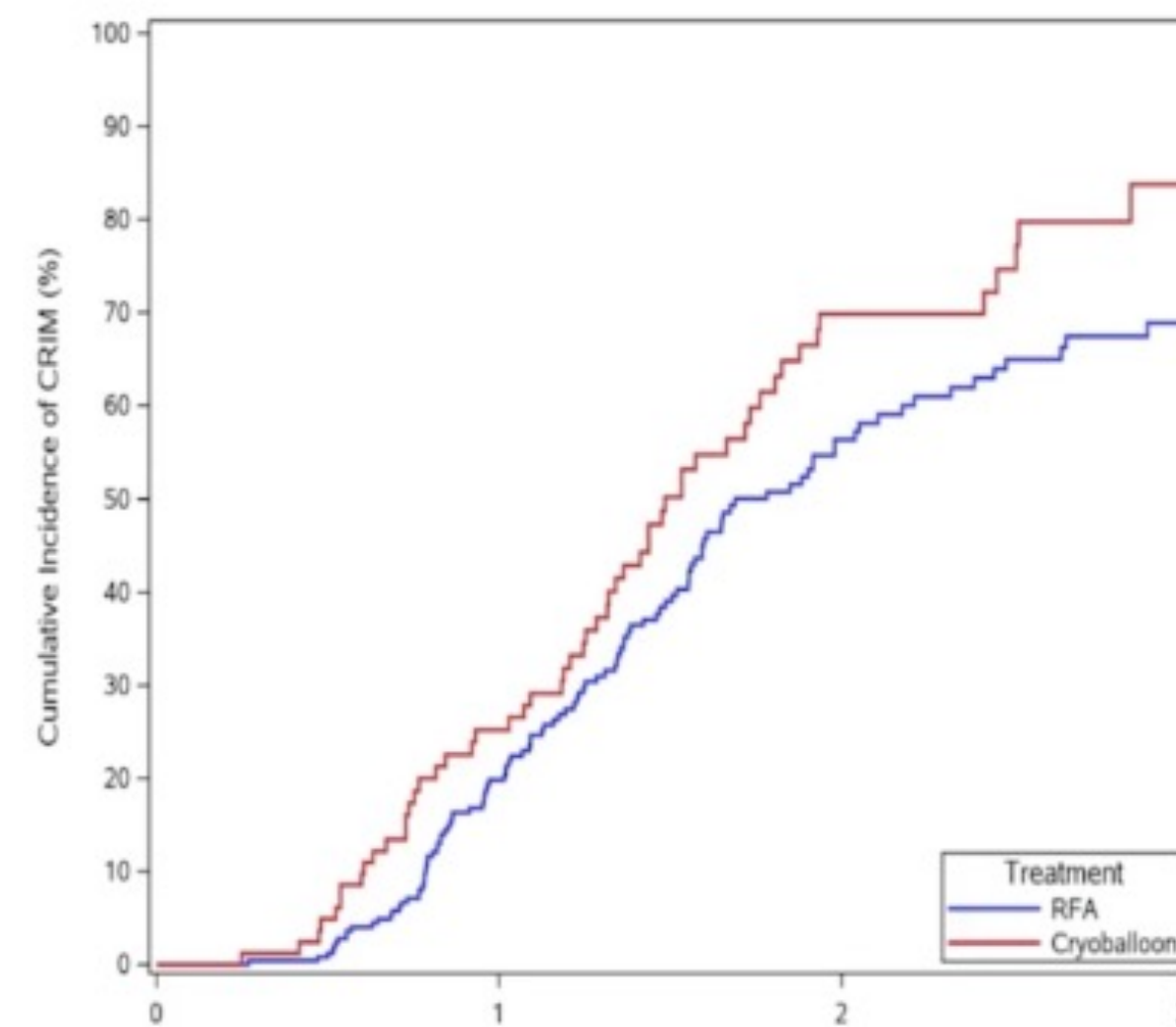
Radiofrequency Ablation

- CE-IM in 78%
- CE-D in 91%
- Most common adverse event, Stricture, 5%

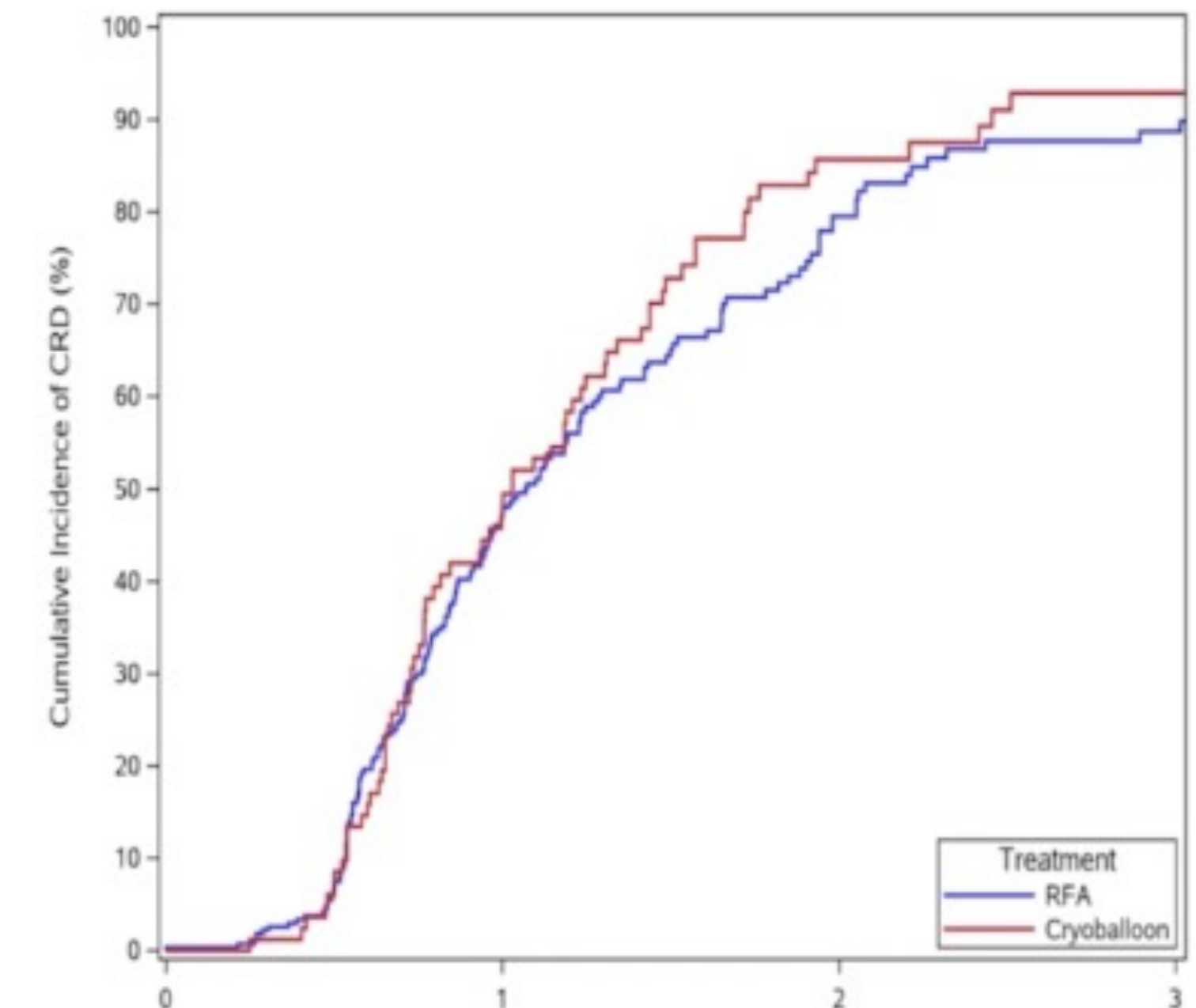


Cold may be as good as hot... data is emerging

- Multi-center propensity score matched cohort
- 85 cryoballoon (1.5 yr f/u) vs 284 RFA (2 yr f/u)
- Cumulative probability favored CBA (with confounding variables of length of BE and prior EMR)
- Comparable CRD and CRIM on multivariate analysis
- Comparable adverse events



2yr	RFA	CBA
CRIM	56.3%	69.8%
CR-D	79.6%	85.7%



Comparative Outcomes of Endoscopic Eradication Therapy for Dysplastic BE using RFA and Cryoballoon Ablation: A Multicenter Propensity Score Matched Cohort Study. Agarwal S et al

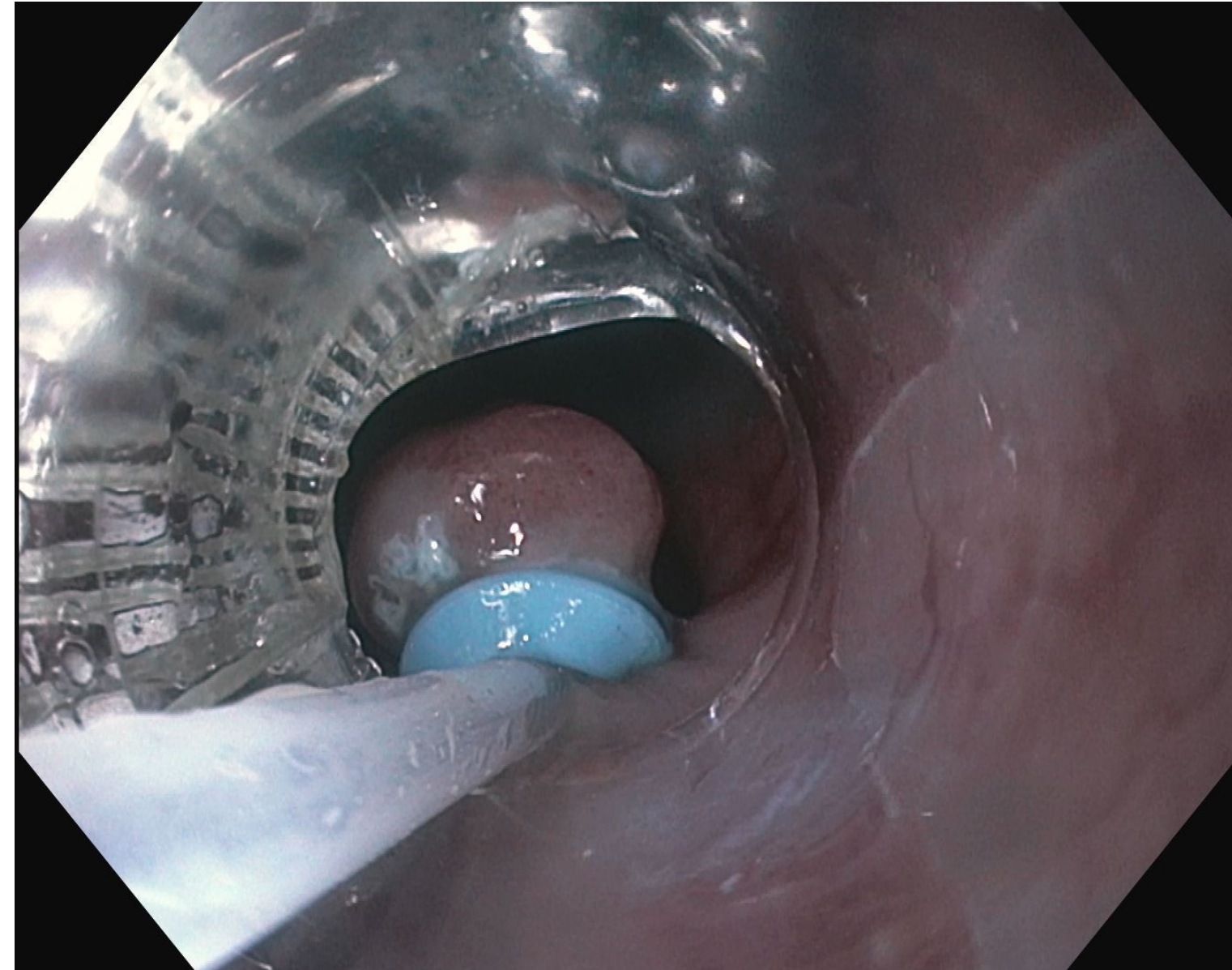
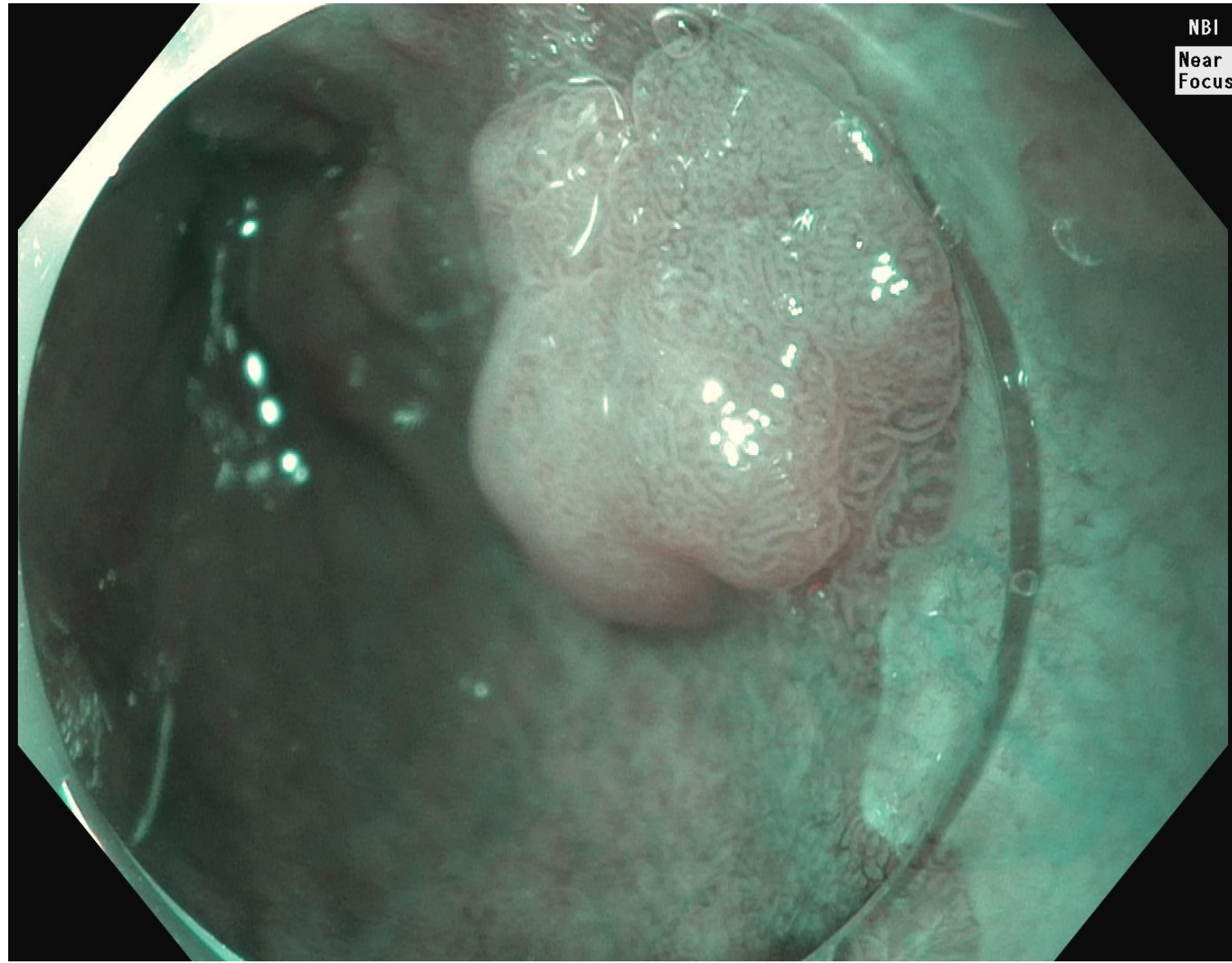
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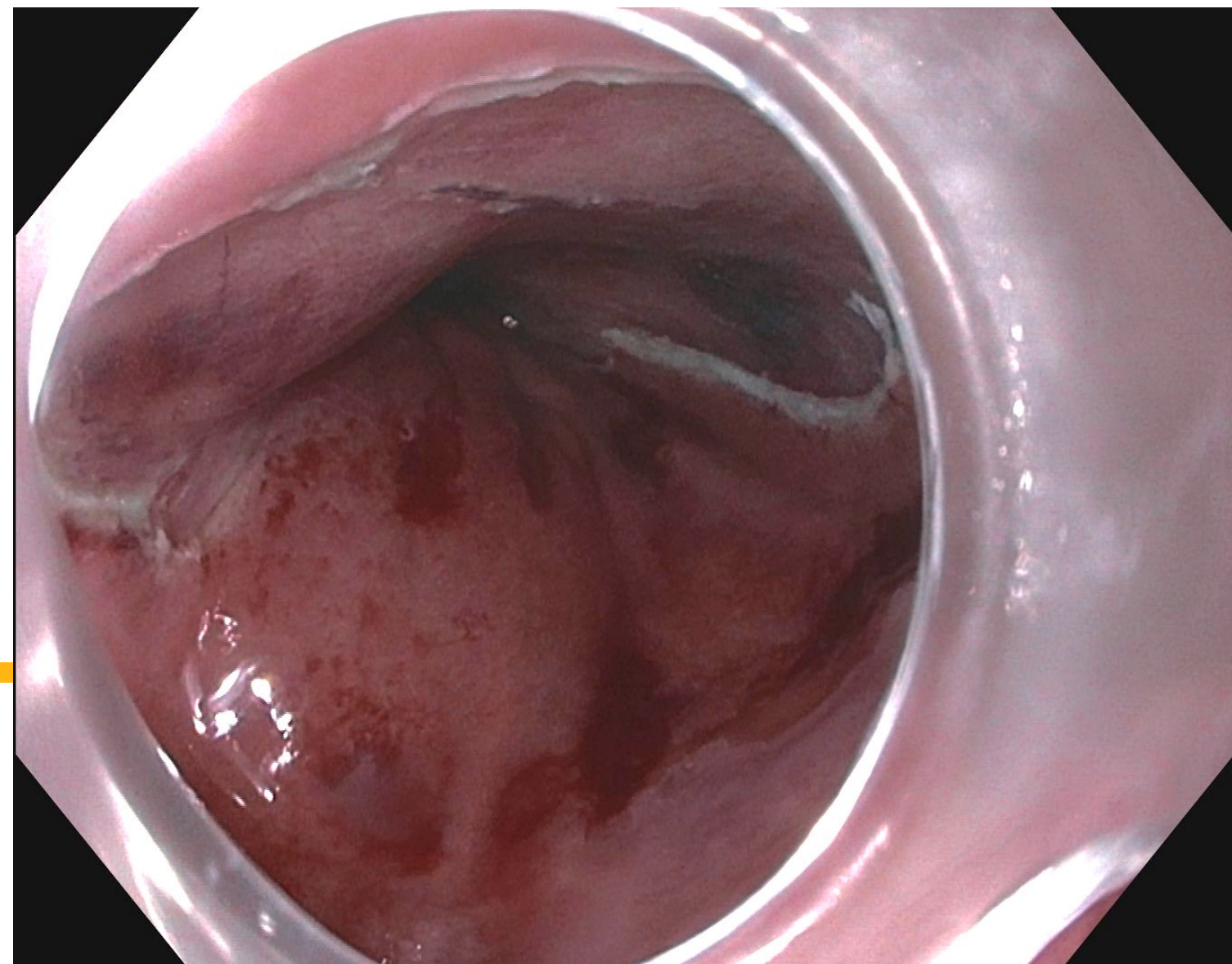
***Ample efficacy data
for complete
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EMR



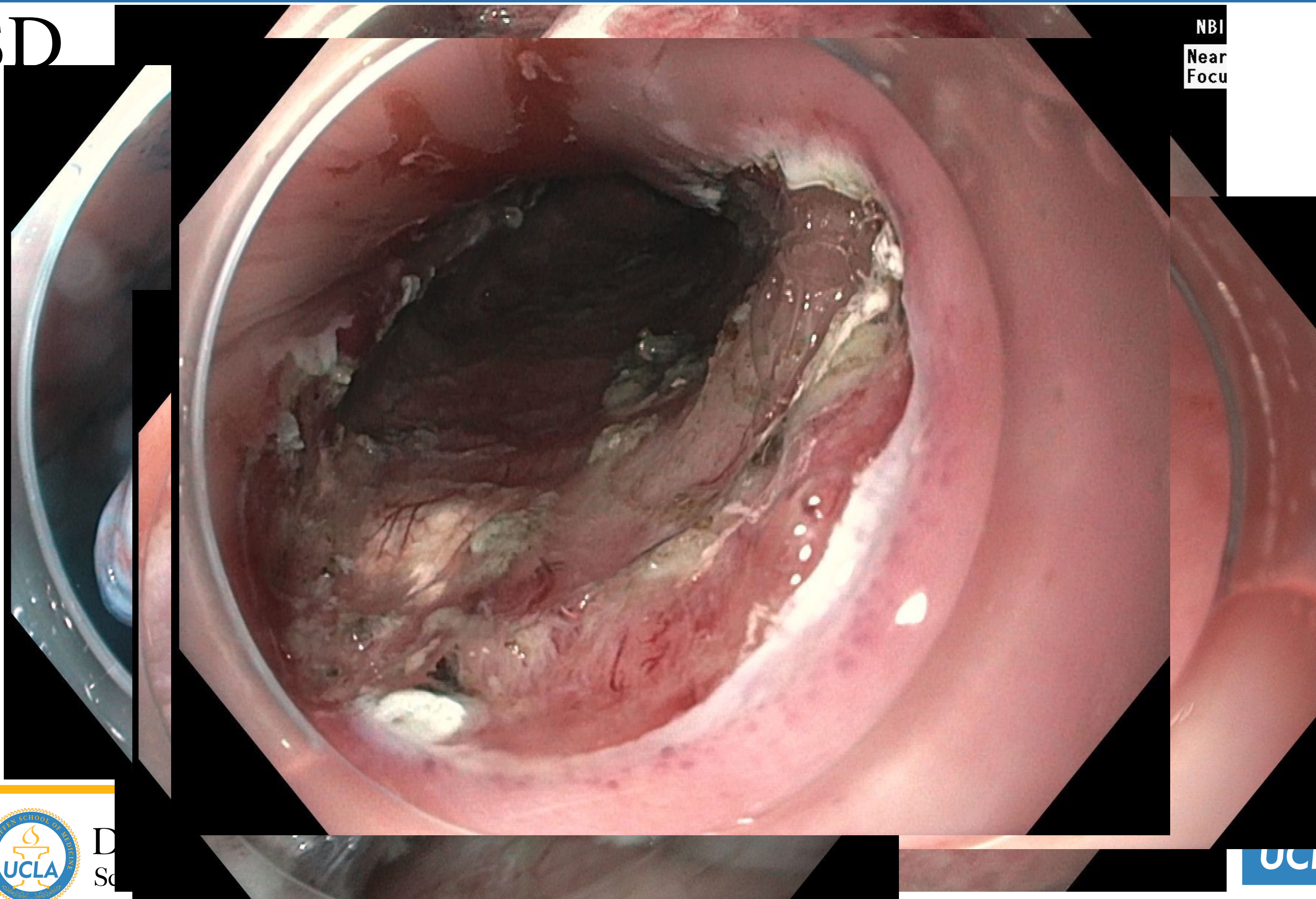
- ✓ Easier
- ✓ Faster
- ✓ Safer



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ESD



- ✓ Accurate pathologic assessment
- ✓ Less recurrence
- ✓ Bulky lesions
- ✓ T1bSM1
 - (-) LVI
 - (-) poor diff

The Role of ESD in Barrett's Neoplasia; Nationwide Experience

- Efficacy and safety data of all Barrett's ESD in Netherlands since 2008
- Suspicion for sm invasion or large/bulky lesions not amenable to EMR
- 130 ESDs, 30mm, >30% circumference, 97% en bloc
- HGD/m-EAC 48% (En-bloc, R0 87%)
- sm-EAC 52% (19% sm1, 33%sm2 or more) => T1b En-bloc/R0 49%
- R0: no recurrence at 17 month followup
- R1
 - 10/34: residual cancer detected at first followup
 - 24/34 (71%): no residual cancer at esophagectomy (4) or endoscopic followup (9 months)
- 1 perforation (clipped), 3% bleed, 13% stricture (3 dilations)
- Conclude: ESD is safe and effective for early Barrett's cancer, R1 resection does not necessarily imply residual cancer and need for surgery



Select T1b cancers may do well with endoscopic resection alone

- 18 studies, 447 patients, 2000-2020 of EET of T1b Barrett's cancers, 5-72 month followup
- Pooled estimated data
- Remission 73%
- EAC mortality 5.7% 3 year, 11% 5 year
- Low risk (sm1, no LVI, well/mod diff)
 - Remission 82%
 - EAC mortality 1.4% 3 year, 0% at 5 year (*one study)



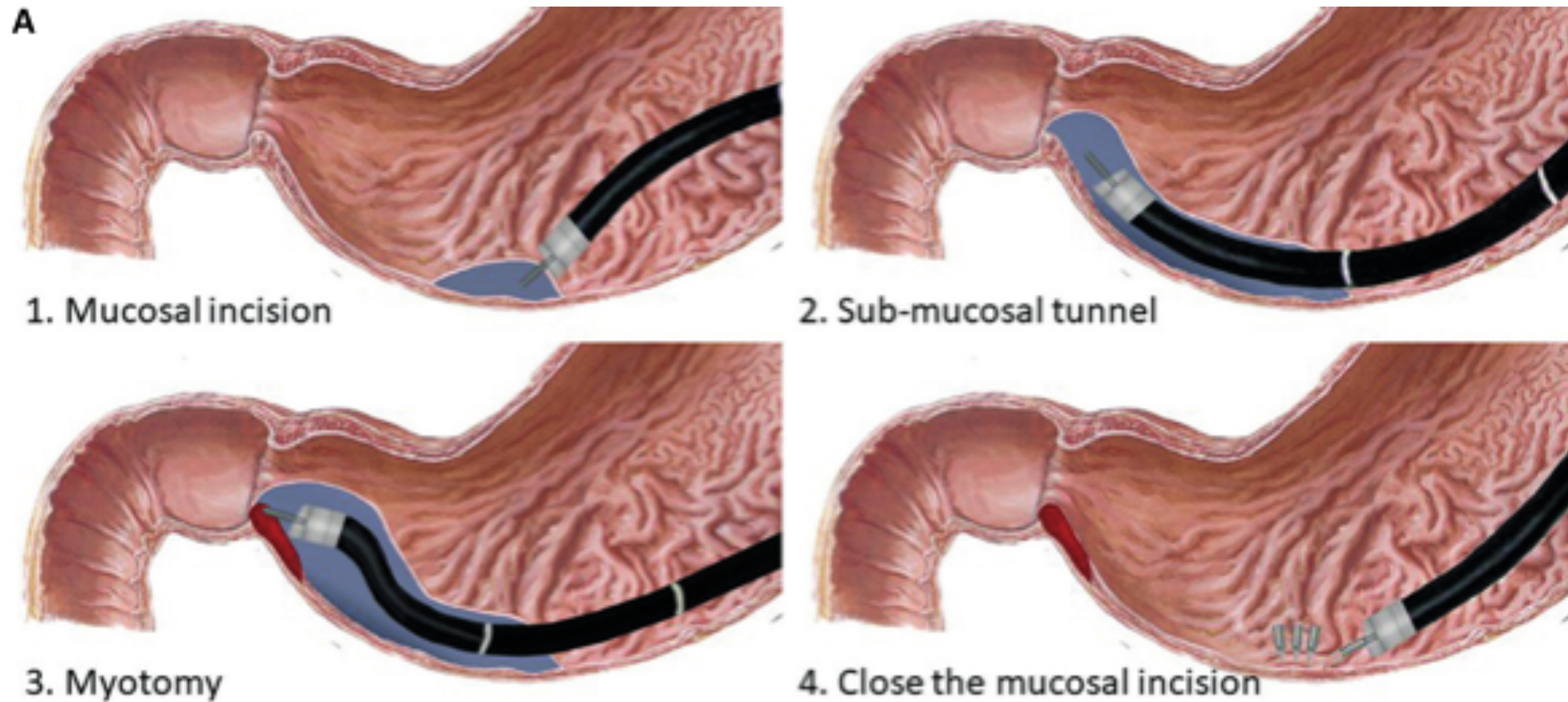
Take home points: Barrett's esophagus

- Cryotherapy is an emerging ablative therapy that needs additional efficacy and comparative data
- The role of ESD in early Barrett's cancer is interesting but difficult to pin down and needs further study. Consider referring bulky lesions, suspicion of SM invasion (based on pit pattern), or bx proven cancers for consideration of ESD (vs EMR)
- Select T1b cancers may be management endoscopically but require careful multidisciplinary discussion and further outcomes data

G-POEM: a quick update



G-POEM for gastroparesis



A meta-analysis and review of GPOEM

- Meta-analysis 20 studies, 796 pts (18 retro, 2 prospective)
- idiopathic (34%), diabetic (28%)
- technical success 98%, 2.8 day hospital stay
- clinical success ~75%
 - GCSI decrease 1.6, $P < 0.001$ (avg f/u 8 months)
 - ~50% improvement of 4h GES (avg f/u 5.4 months)
 - No difference in improvement per etiology
- 11% AE



GPOEM post lung transplant

- 6 centers, post LTx GPOEM 2018-2020, 20 patients, avg 13 months post transplant
- 12 botox and 1 pyloric stent
- 85% patients with clinical success at 8.9 month followup
- 15% delayed AE (1 bleed, 1 pyloric stenosis, 1 ulcer)
- GES normalization in 47%
- 14/20 off PPI
- 5 patients had pre and post GPOEM pHmetry: all normalized



Take home points: G-POEM

- GPOEM data is expanding; more is needed including durability data and comparative data; patient selection remains elusive
- Gastroparesis and GERD is an important graft-threatening condition post lung transplant; G-POEM appears feasible and safe in this select population and may provide a minimally invasive means address this problem and preserve organ function

Thank you!



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