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# NCSCG GI SYMPOSIUM

October 17-18, 2020

Virtual Conference

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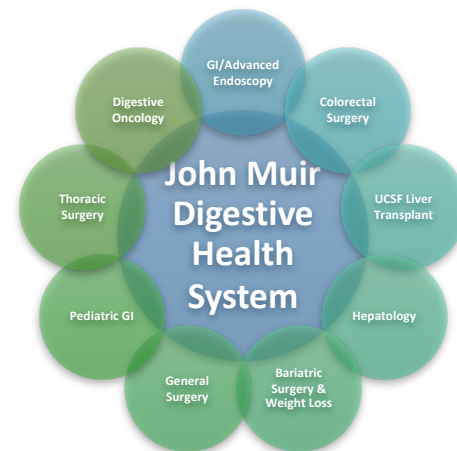
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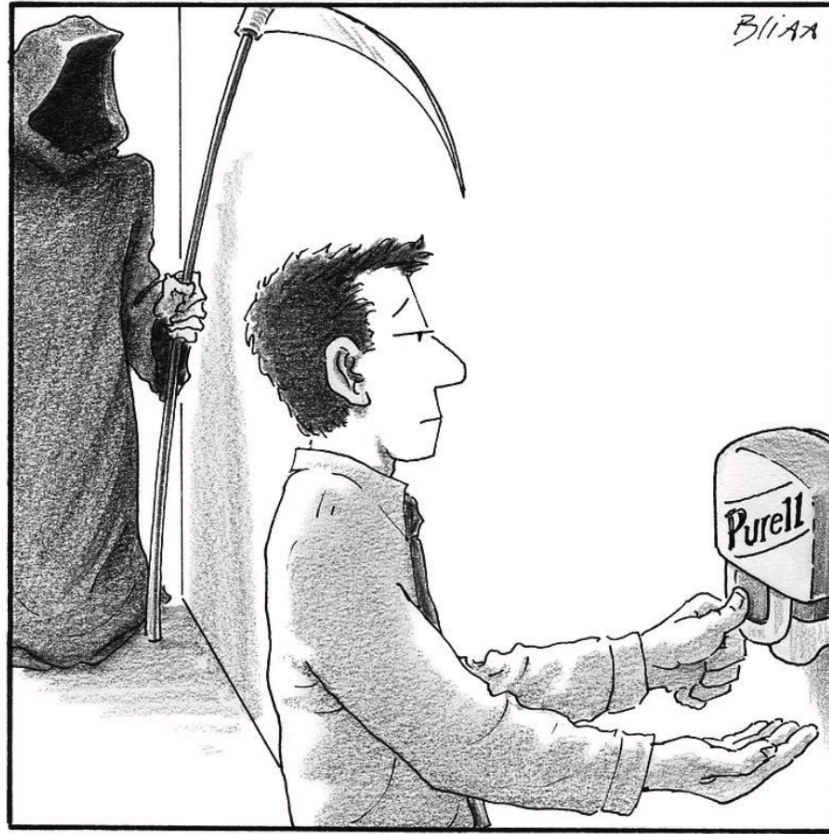
## Per Oral Endoscopic Myotomy and the Third Space of Interventional Endoscopy

Drew Schembre, MD, FACG, FASGE  
Director, John Muir Digestive Health System





*"Hand over your Purell."*



*"Don't bother."*



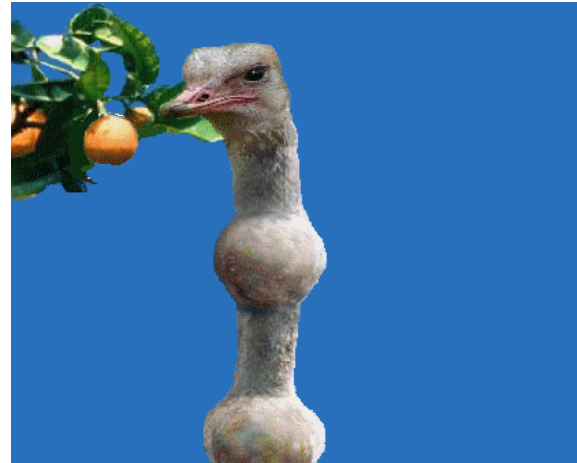
# Disclosures

- Cook Medical: Royalty agreement and speakers bureau
- Boston Scientific Corp: Consulting, speakers bureau

# Per Oral Endoscopic Myotomy or POEM

“A poem begins as a lump in the  
throat, a sense of wrong....”

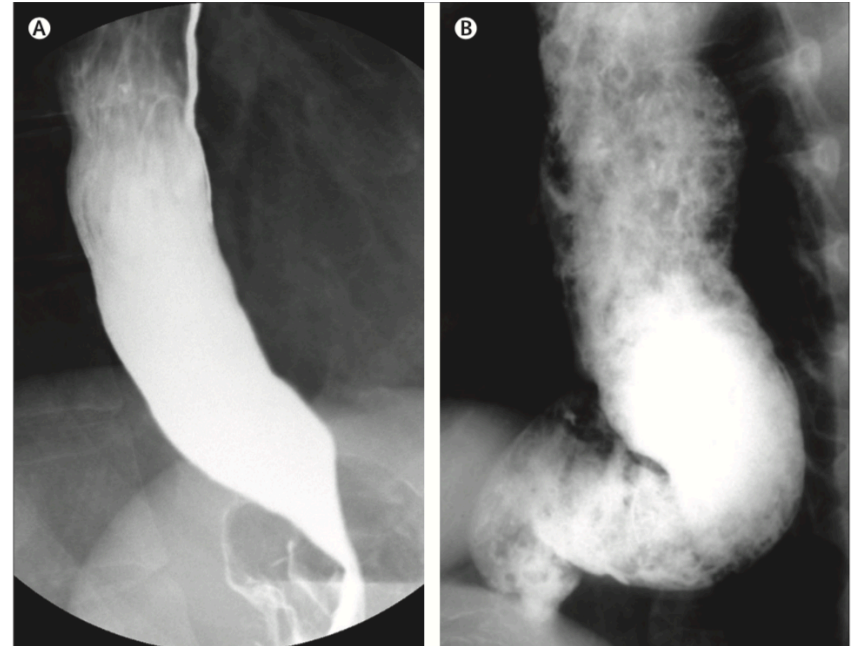
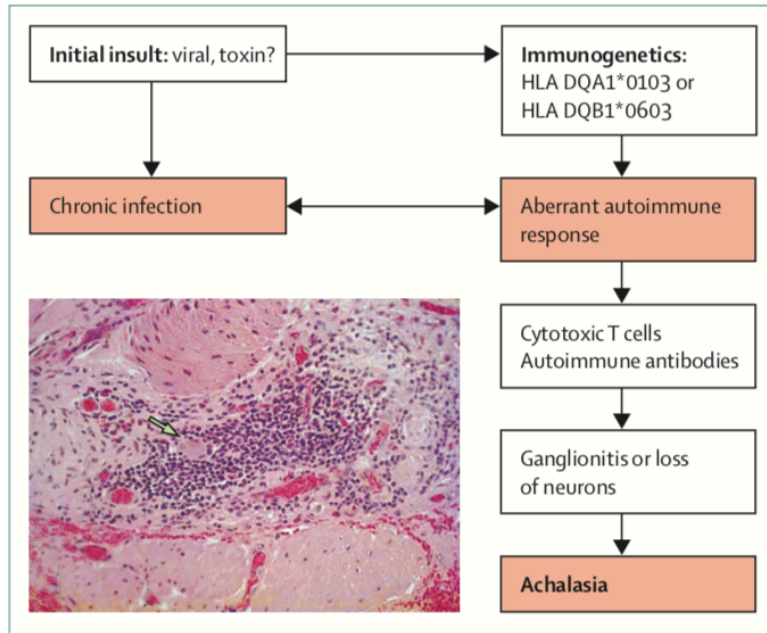
--Robert Frost



# Achalasia

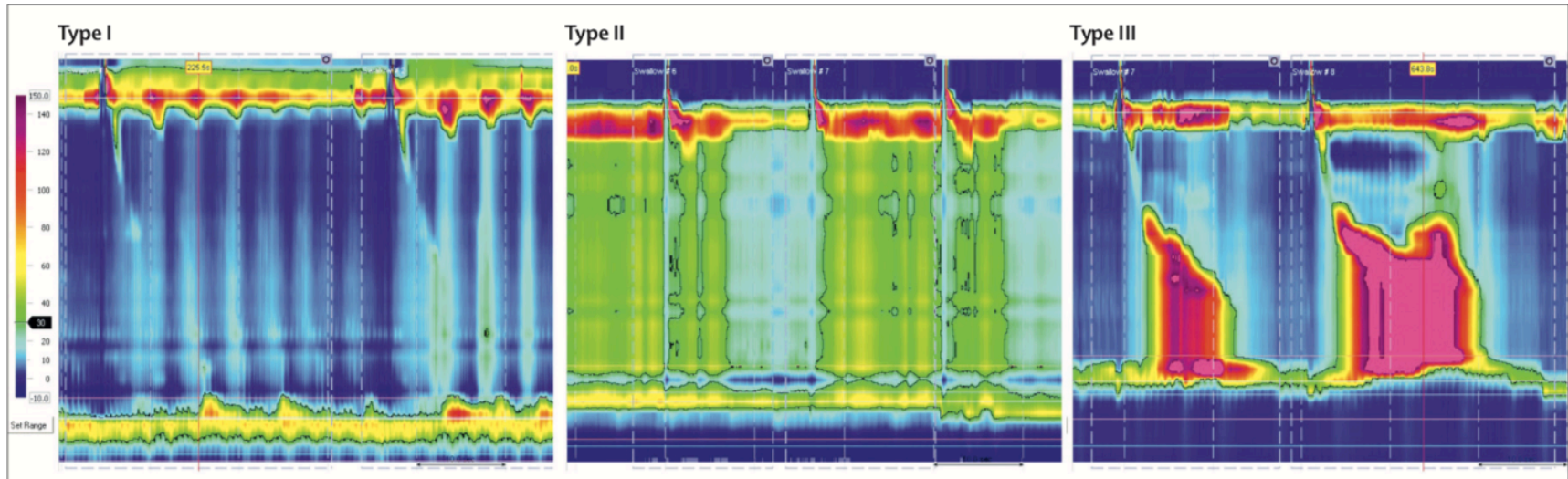
- Achalasia is a rare motility disorder characterized by loss of enteric neurons leading to absence of peristalsis and impaired relaxation of the LES.
- Its causes remains largely unknown
  - ganglionitis resulting from an aberrant immune response triggered by a viral infection may lead to the loss of esophageal neurons, particularly in genetically susceptible individuals.
- Stasis of ingested food causes regurgitation, chest pain, and weight loss
  - can also increase the risk of esophageal carcinoma and aspiration.

# Achalasia



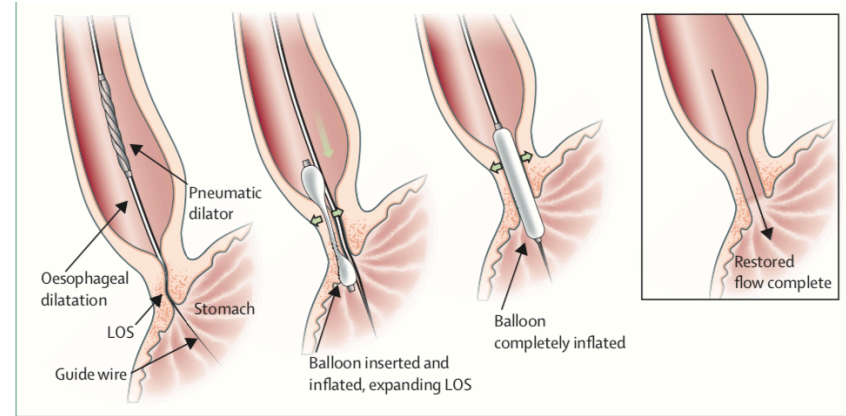


# Types of Achalasia



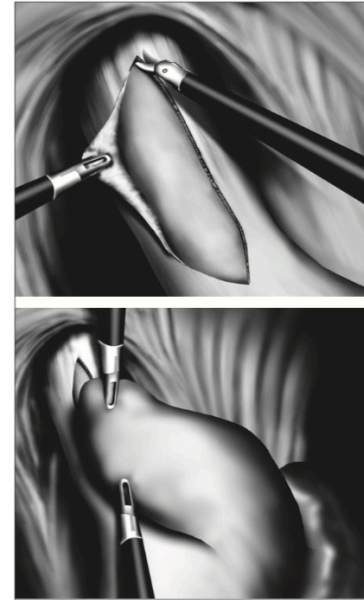
# Forceful balloon dilation

- Low cost, moderately effective treatment
- Usually starting at 30 mm, repeated at 35 or 40 mm if ineffective
- Can be done without general anesthesia
- 3 year improvement ranges from 74-90%, in part related to balloon size
- Approximately 2-7% perforation risk
  - Historically this required emergent surgery
  - Can now usually be treated endoscopically
- By 6 years, a third will relapse



# Heller Myotomy

- Introduced in 1913 by Earnest Heller
  - Modified as a thoracoscopic then laparoscopic procedure in 1992
- Usually accompanied by a partial anti-reflux wrap such as a Dor or Toupet
- In large series, the mean success rate was 89%
  - Recurrence of symptoms can occur at 5 years in 25% or more
- Complications are rare
  - Mortality <0.1%
  - Serious morbidity <1%



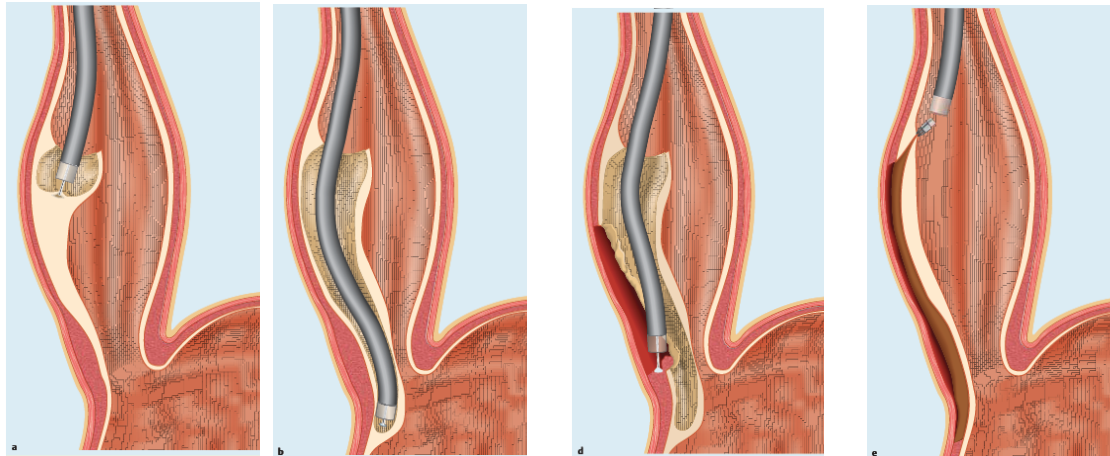
# POEM

- Concept evolved from techniques developed for NOTES
  - In early 2000s, Jay Pasrisha performs a version in animal model
- First performed in humans in Japan by Inoe in 2008
  - Reported his first 5000 cases in 2015
- Over 10,000 cases have been performed by 2018
- Learning curve suggests a “plateau” at 15-20 cases, “efficiency” at 40 and “mastery” at 60 cases.



# POEM

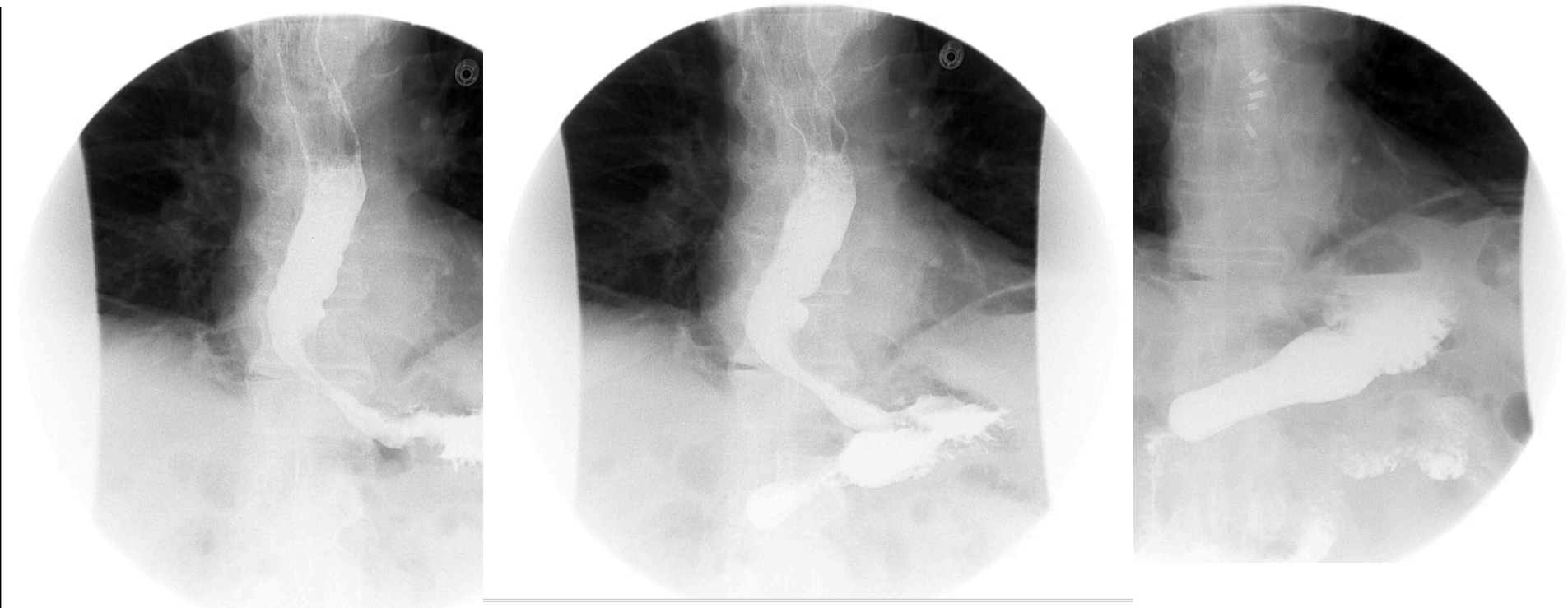
- Landmark measurements
- Mucosotomy 5 cm above myotomy
- Myotomy 2 cm above to 2 cm below HPZ



# Post POEM Care

- Overnight admission, NPO with pain and nausea medication and HOB elevation
- Gastrografin swallow next morning to ensure no leak and good flow through LES
- Discharge on full liquids for one week followed by soft diet for another week
- Do not routinely prescribe PPIs
- Office follow up 2 weeks
- Repeat endoscopy at 6-12 months

# AM Gastrografin Swallow



# Outcomes for POEM

- Success rates range 82-100%
  - Symptoms may recur in up to 25% at 5 years
- Complication rates of up to 10%
  - Serious complications in 3.2%
    - Usually during the first 50 cases
  - No deaths yet reported
  - Not significantly different in octogenarians and children



# POEM vs Heller

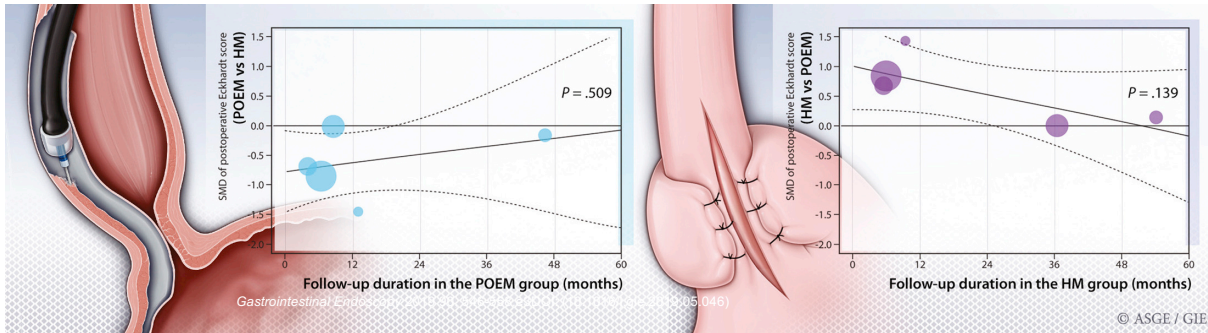
## *Comparative efficacy of per-oral endoscopic myotomy and Heller myotomy in patients with achalasia: a meta-analysis*

Chan Hyuk Park, MD, PhD, Da Hyun Jung, MD, Do Hoon Kim, MD, PhD, Chul-Hyun Lim, MD, PhD, Hee Seok Moon, MD, PhD, Jung Ho Park, MD, PhD, Hye-Kyung Jung, MD, PhD, Su Jin Hong, MD, PhD, Suck Chei Choi, MD, PhD, Oh Young Lee, MD, PhD

*Gastrointestinal Endoscopy*

Volume 90, Issue 4, Pages 546-558.e3 (October 2019)

DOI: 10.1016/j.gie.2019.05.046

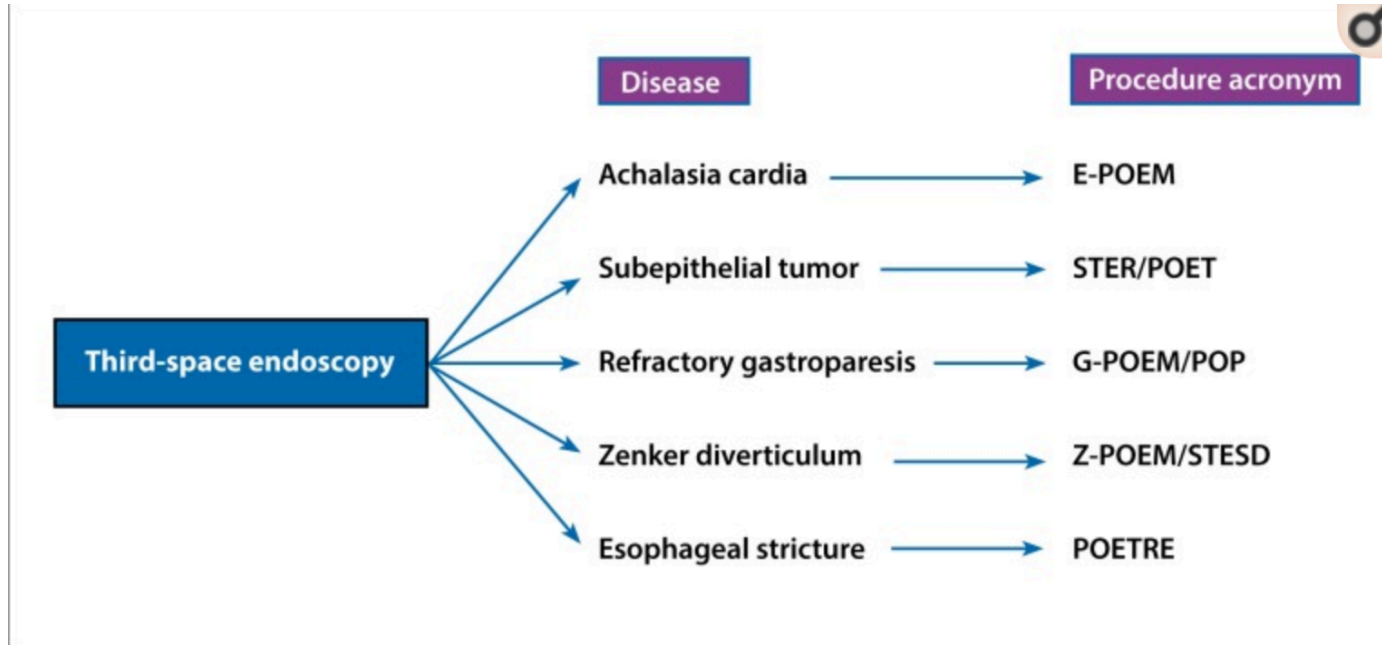


# POEM vs Heller

- Meta-analysis (Annals of Surgery) of 5834 LHM vs 1958 POEM patients showed
  - Better 2 year improvement with POEM (92.7% vs 90%  $p=.01$ )
  - Significantly more GERD among POEM patients
  - Patients with symptomatic GERD were similar
  - “Short-term results show that POEM is more effective than LHM in relieving dysphagia, but it is associated with a very high incidence of pathologic reflux”
- Meta-analysis (GIE) of 1213 patients showed
  - Similar results with better Eckardt scores at 2 years among POEM patients
  - Significantly more GERD among POEM patients
  - Patients with symptomatic GERD were similar
  - “Although long-term follow-up data are insufficient, the short-term efficacy of POEM was superior to that of HM. Erosive esophagitis tended to be more common in the POEM group; however, there was no difference in reflux symptoms and pathologic reflux on pH monitoring between the groups
- In Type III patients, POEM allowed for a longer myotomy length
  - Better response (98% vs 80%  $p=.01$ )
  - Shorter procedure time (102 min vs 264  $p<.01$ )
  - Fewer complications (6% vs 27%  $p<.01$ )

*Schlottman et al Ann Surgery 2018,  
Park et al., GIE 2019  
Kumbhari et al, Endosc 2015*

# Beyond POEM

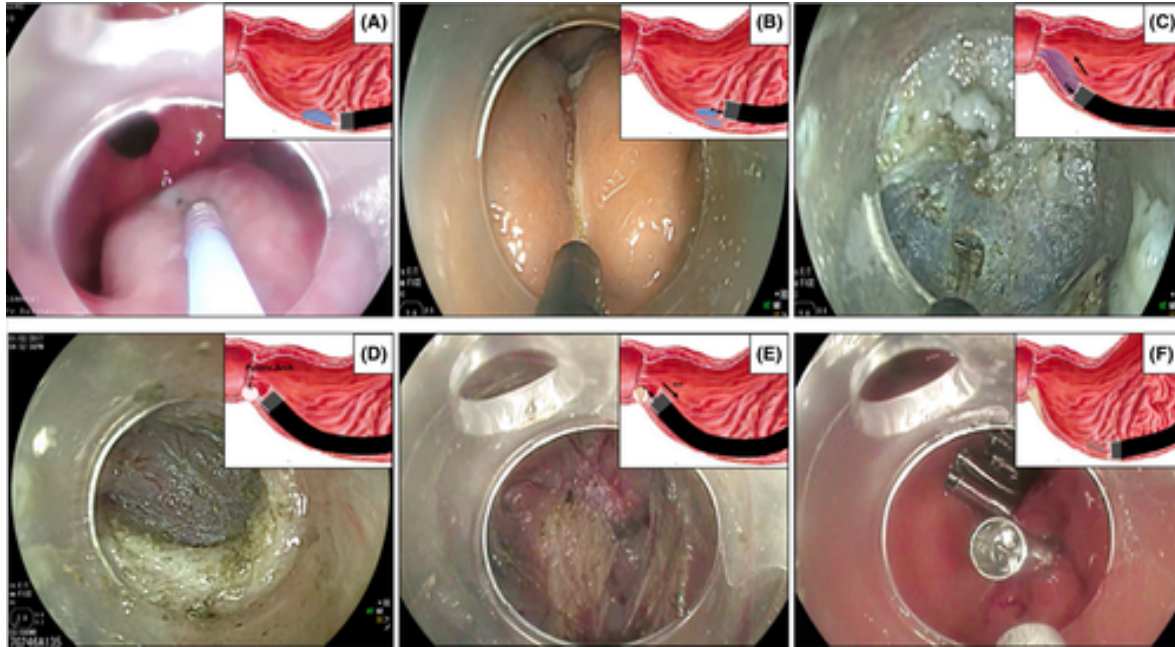


# G-POEM

- Gastroparesis can result in significant morbidity despite the cause
- Therapies, including prokinetic medications, diet, and gastric stimulators have been minimally or moderately effective
- Surgical therapies have been inconsistent and often require prolonged pain medication during recovery
- Stenting has a high frequency of migration
- Botox has been inconsistent and wears off



# G-POEM

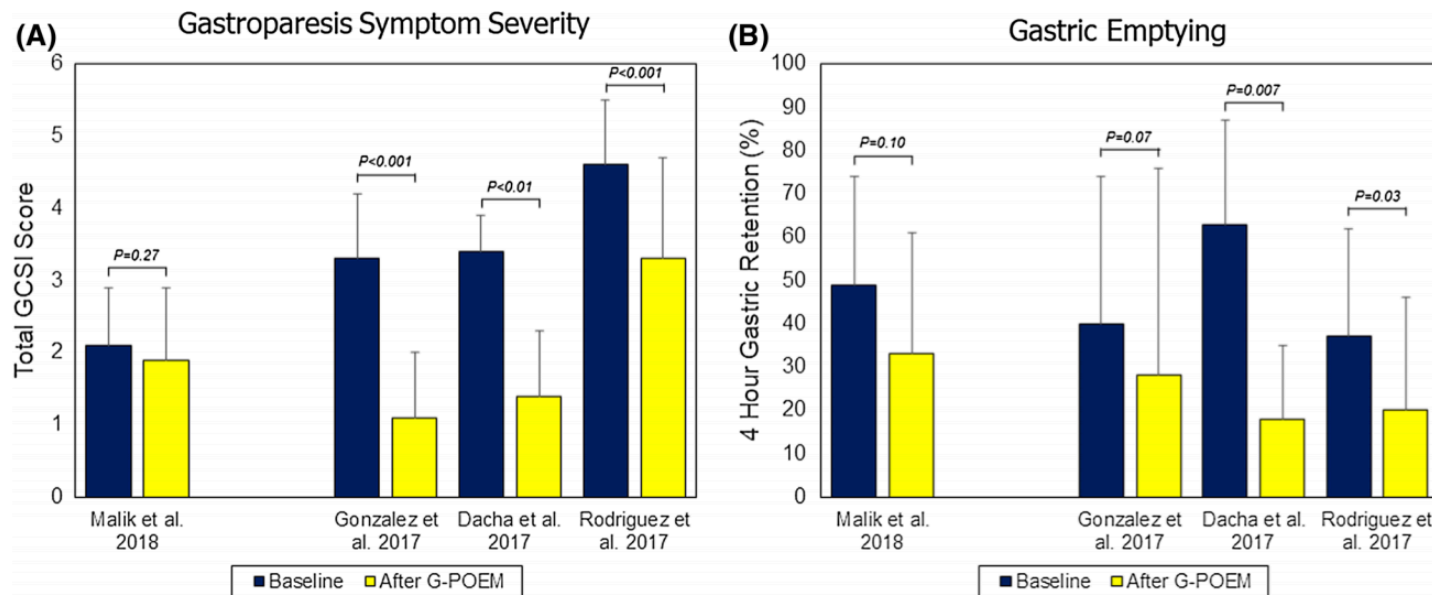


# G-POEM

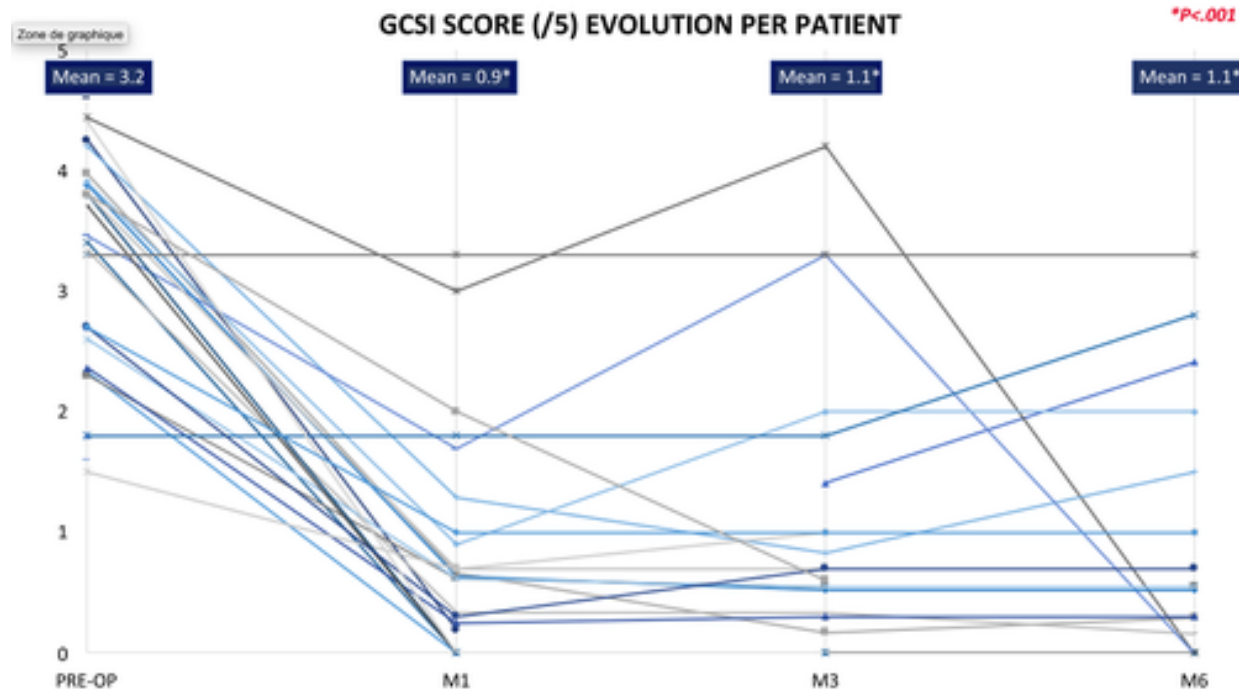
**Table 4.** Studies Evaluating the Outcome of G-POEM in Refractory Gastroparesis

Study	Patients, N	Etiology of Gastroparesis	Mean Procedure Time, Minutes	Outcome Measures, Pre-G-POEM/Post-G-POEM: GCSI GES Retention at 4 Hours	Follow-Up, Months
Gonzalez et al <sup>43</sup>	12	Diabetic: 5 Idiopathic: 6 Postsurgical: 1	51 (range, 32-105)	3.5 ± 0.8/1.1 ± 1.5 40%/19%	3
Khashab et al <sup>42</sup>	30	Diabetic: 11 Idiopathic: 7 Postsurgical: 12	72 ± 42	Clinical response, -86% GES improvement, -82%	5.5
Rodriguez et al <sup>47</sup>	47	Diabetic: 12 Idiopathic: 27 Postsurgical: 8	41.2 ± 28.5	4.6 ± 0.9/3.3 ± 1.4 37%/20%	3
Xue et al <sup>41</sup>	14	Diabetic: 6 Idiopathic: 6 Postsurgical: 1 Postinfectious: 1	36 ± 13 (with fluoroscopy guidance) 56 ± 13 (without fluoroscopy guidance)	3.42 ± 0.48/1.33 ± 0.6 (pylorus identified) 3.00 ± 0.5/1.88 ± 1.74 (pylorus not identified) 83%/33% <sup>a</sup>	NA
Dacha et al <sup>44</sup>	16	Diabetic: 9 Idiopathic: 5 Postsurgical: 1 Postinfectious: 1	49.7 ± 22.1	3.40 ± 0.50/1.46 ± 1.4 62.9%/17.6%	12

# G-POEM

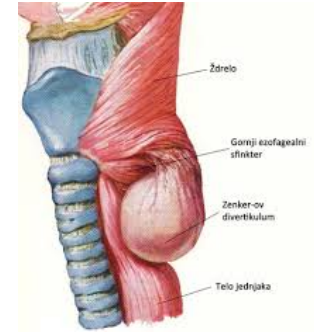


# G-POEM with antro-pyloromyotomy for the treatment of refractory gastroparesis: mid-term follow-up and factors predicting outcome



# Z-POEM

- Zenker's diverticulum is an uncommon, progressive out-pocketing of the proximal esophagus, usually in older patients at Killian's triangle
- It can vary from a minor annoyance to a source of aspiration and malnutrition
- A variety of surgical and endoscopic procedures have been developed, each attempting to be less invasive and more effective

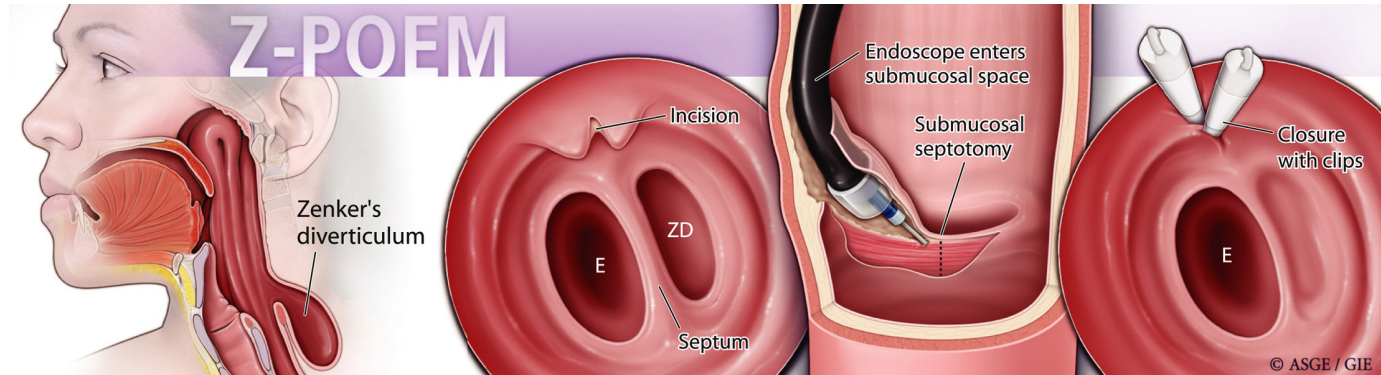




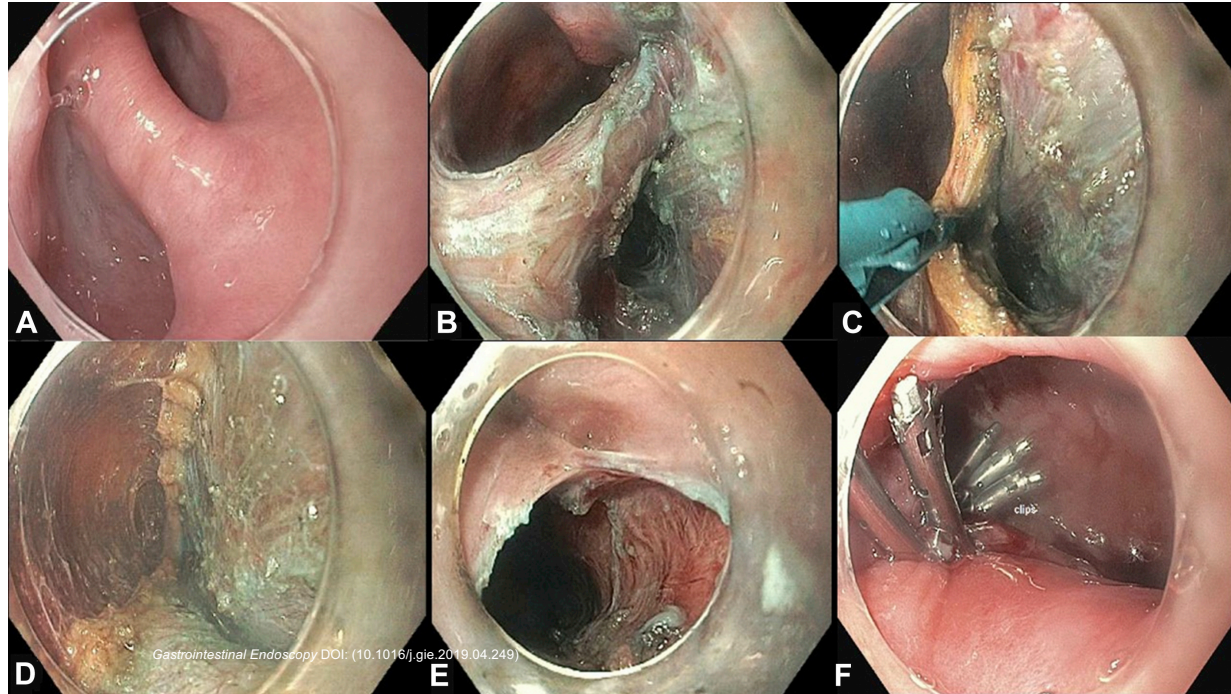
## *An international study on the use of peroral endoscopic myotomy in the management of Zenker's diverticulum*

*Juliana Yang, MD, Stephanie Novak, MD, Michael Ujiki, MD, Óscar Hernández, MD, Pankaj Desai, MD, Petros Benias, MD, David Lee, MD, Kenneth Chang, MD, Bertrand Brieau, MD, Maximilien Barret, MD, Nikhil Kumta, MD, Xianhui Zeng, MD, Bing Hu, MD, Konstantinos Delis, MD, Mouen A. Khashab, MD*

*Gastrointestinal Endoscopy*  
Volume 91 Issue 1 Pages 163-168 (January 2020)  
DOI: 10.1016/j.gie.2019.04.249



# Z-POEM



# An international study on the use of peroral endoscopic myotomy in the management of Zenker's diverticulum

Juliana Yang, MD, Stephanie Novak, MD, Michael Ujiki, MD, Óscar Hernández, MD, Pankej Desai, MD, Petros Benias, MD, David Lee, MD, Kenneth Chang, MD, Bertrand Brieau, MD, Maximilien Barret, MD, Nikhil Kumta, MD, Xianhui Zeng, MD, Bing Hu, MD, Konstantinos Delis, MD, Mouen A. Khashab, MD

Gastrointestinal Endoscopy 2019

**Table 2**

Technical and clinical outcomes of the Zenker's peroral endoscopic myotomy technique (n = 75)

Outcomes	Value
Clinical success, % (n)	92 (69)
Technical success, % (n)	97.3 (73)
Mean peroral endoscopic myotomy procedure time, min, mean $\pm$ SD	52.4 $\pm$ 2.9
Repeat interventions	
Surgical interventions	0
Endoscopic interventions	1
Postprocedure follow-up, days, median (IQR)	291.5 (103.5-436)
Days of hospitalization, mean $\pm$ SD	1.8 $\pm$ .2
Preprocedure dysphagia score, mean $\pm$ SD	1.96 $\pm$ .68
Postprocedure dysphagia score, mean $\pm$ SD	.25 $\pm$ .52

[View Table in HTML](#)

SD, Standard deviation; IQR, interquartile range.

# An international study on the use of peroral endoscopic myotomy in the management of Zenker's diverticulum

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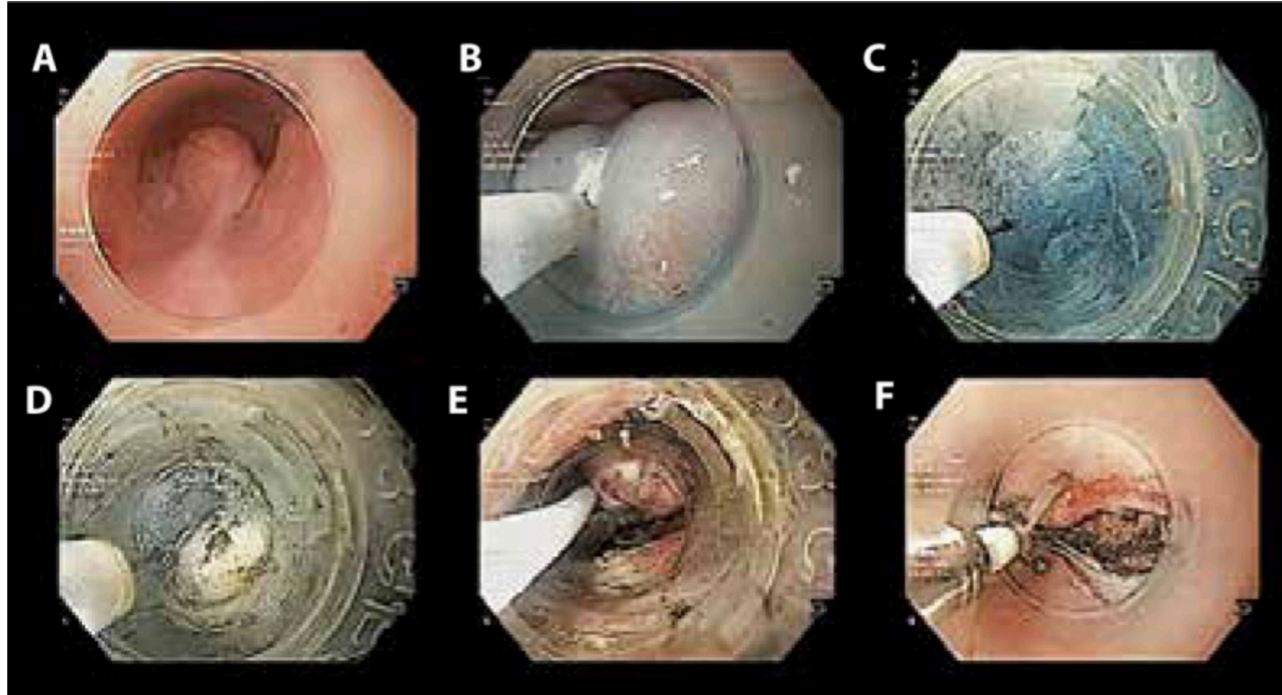
Outcomes	Value
Clinical success, % (n)	92 (69)
Technical success, % (n)	97.3 (73)
Mean peroral endoscopic myotomy procedure time, min, mean $\pm$ SD	59.4 $\pm$ 2.1
Repeat interventions	
Surgical interventions	0
Endoscopic interventions	1
Postprocedure follow-up, days, median (IQR)	291.5 (103.5-436)
Days of hospitalization, mean $\pm$ SD	1.8 $\pm$ .2
Preprocedure dysphagia score, mean $\pm$ SD	1.96 $\pm$ .68
Postprocedure dysphagia score, mean $\pm$ SD	.25 $\pm$ .52

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# Submucosal Tunneling Endoscopic Resection (STER)





# Submucosal Tunneling Endoscopic Resection (STER)

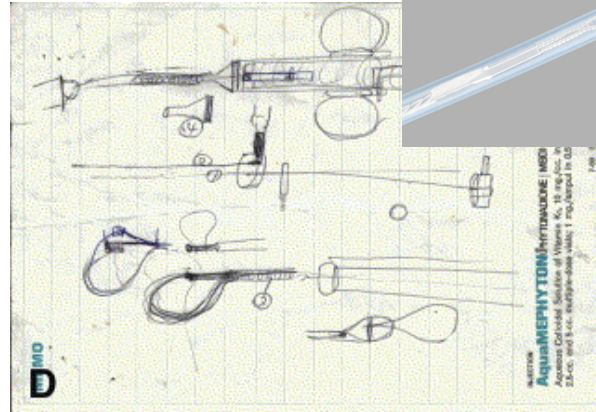
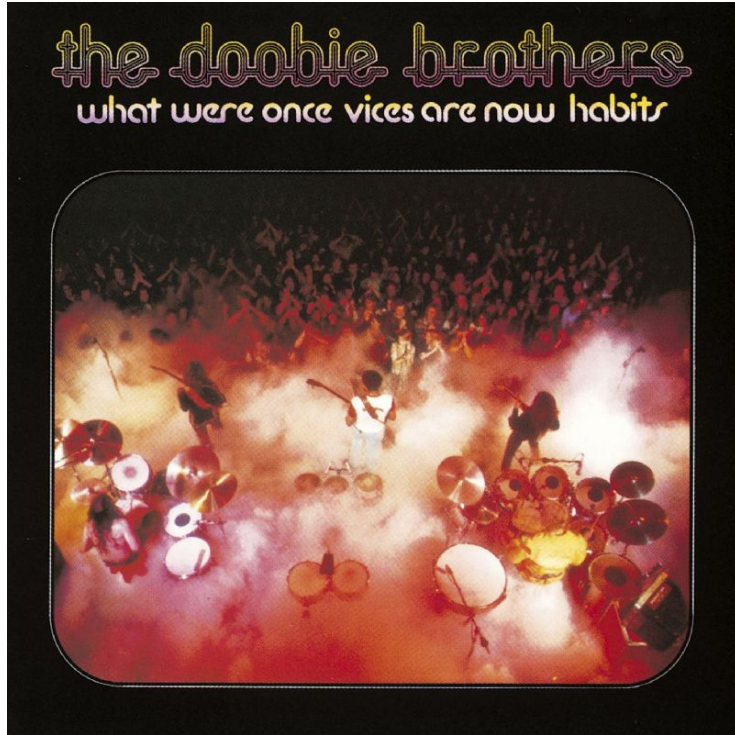
**Table 3.** Safety and Efficacy of Submucosal Tunneling Endoscopic Resection in Subepithelial Tumors

Study	Patients, N	Location of Subepithelial Tumors	Size, Cm (Range)	En-Bloc Resection, %	Complications, %	Recurrence, %/ Median Follow-Up, Months
Chen et al <sup>25</sup>	290	Esophagus: 199 Esophagogastric junction: 68 Stomach: 23	2.1 (1.0-7.0)	89.3	23.4	NA
Ye et al <sup>26</sup>	85	Esophagus: 60 Cardia: 16 Stomach: 9	1.9 (1.0-3.0)	100	9.4	0/8
Wang et al <sup>27</sup>	80 (total tumors: 83)	Esophagus: 67 Cardia: 16	2.3 (1.0-5.5)	97.6	8.75	0/10.2 (mean)
Li et al <sup>28</sup>	74	Esophagus: 74	1.89 ± 0.72 (mean)	98.6	5.4	2.7/19.5
Mao et al <sup>29</sup>	56	Esophagus: 18 Stomach: 38	1.8 (1.0-3.2)	100	15.3	0/25

# Conclusions

- POEM offers at least an equivalent alternative to Heller myotomy for patients with all types of achalasia with wide patient acceptance
  - Still considered experimental by some insurers and has no CPT code despite wide physician and patient acceptance and well over 10,000 cases performed
- The techniques of submucosal tunneling or third space endoscopy offer opportunities to expand minimally invasive endoscopic therapies for other disorders
  - What seems extreme today may be standard tomorrow

# “What Were Once Vices are Now Habits”



# Thank You for Your Attention!

