Third Space Endoscopy: To Infinity and Beyond

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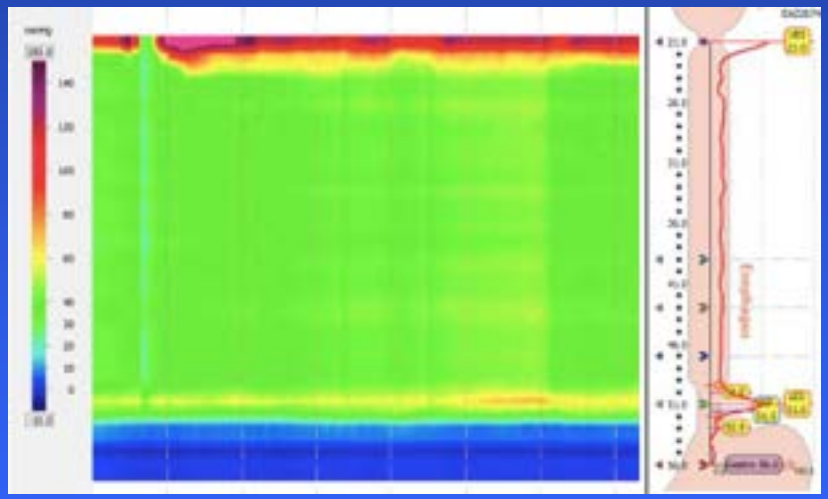
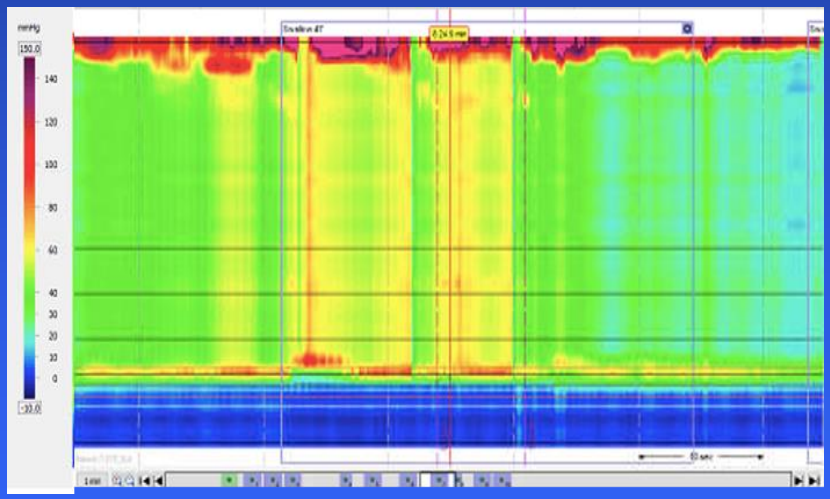
HREM

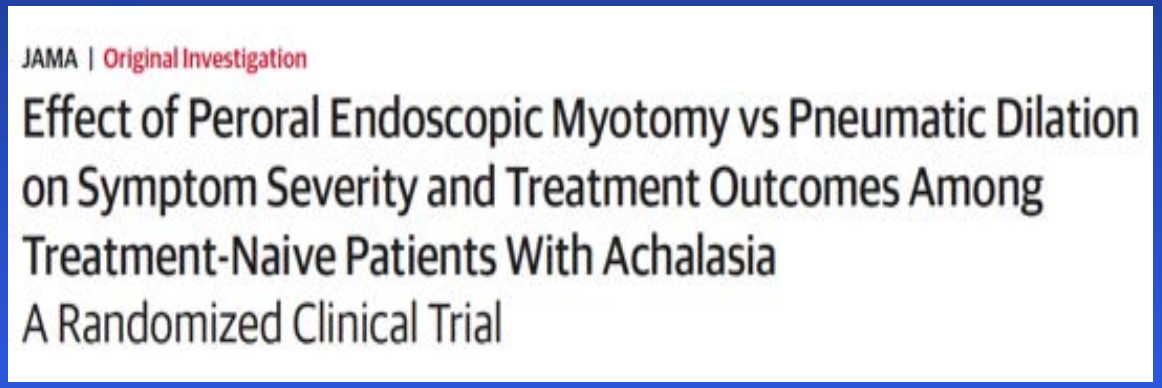
Composite swallow



Swallow # 7



PD or POEM?



JAMA. 2019;322(2):134-144.

Comprehensive Analysis of Adverse Events Associated With Per Oral Endoscopic Myotomy in 1826 Patients: An International Multicenter Study

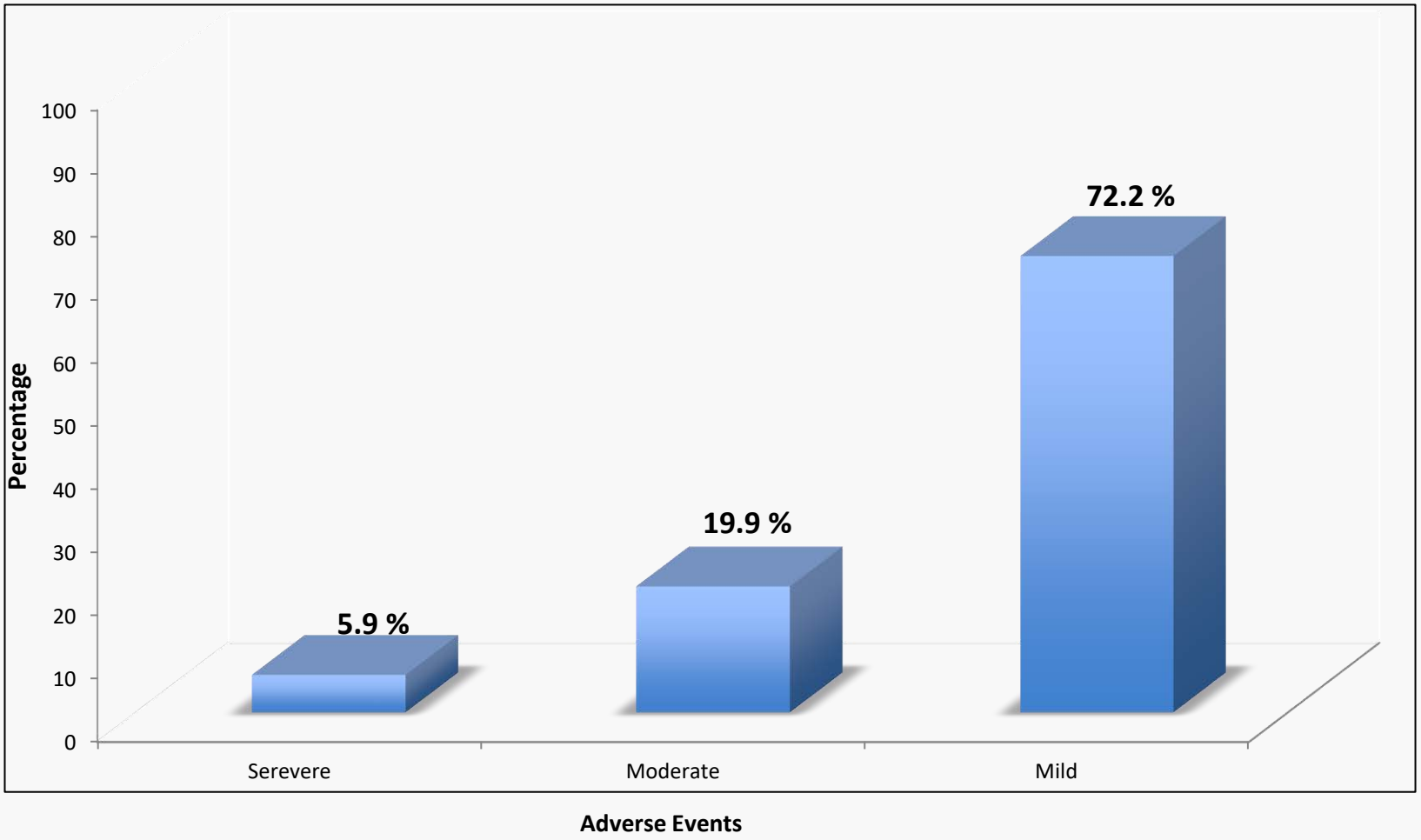
Yamile Haito-Chavez, MD[1], Haruhiro Inoue, MD, PhD[2], Kristin W. Beard, MD[3], Peter V. Draganov, MD[4], Michael Ujiki, MD[5], Burkhard H.A. Rahden, MD[6], Pankaj N. Desai, MD[7], Mathieu Pioche, MD, PhD[8], Bu Hayee, MBBS, PhD[9], Amyn Haji, MD[9], Payal Saxena, MD[10], Kevin Reavis, MD[3], Manabu Onimaru, MD, PhD[2], Valerio Balassone, MD[2], Jun Nakamura, MD, PhD[2], Yoshitaka Hata, MD[2], Dennis Yang, MD[4], Davinderbir Pannu, MD[4], Ali Abbas, MD[4], Yaseen B. Perbtani, MD[4], Lava Y. Patel, MD[5], Jorg Filser, MD[6], Sabine Roman, MD, PhD[8], Jerome Rivory, MD[8], Francois Mion, MD[8], Thierry Ponchon, MD, PhD[8], Silvana Perretta, MD[11], Vivien Wong, MD[11], Roberta Maselli, MD[12], Saowanee Ngamruengphong, MD[1], Yen-I Chen, MD[1], Majidah Bukhari, MD[1], Gulara Hajiyeva, MD[1], Amr Ismail, MD[1], Renata Pieratti, MD[1], Vivek Kumbhari, MD[1], Gerson Galdos-Cardenas, MD, PhD[13], Alessandro Repici, MD[12] and Mouen A. Khashab, MD[1]

Am J Gastroenterol 2017; 112:1267–1276

Results

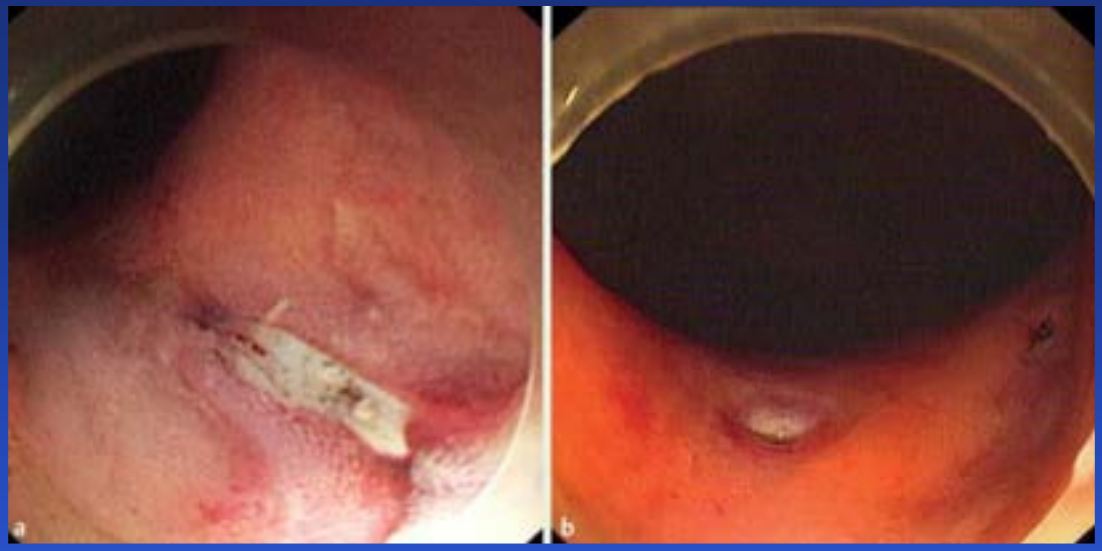
- 1826 patients underwent POEM.
- 137 patients with AEs.
- Total of 156 AEs.
- Overall incidence of AEs: 7.5%.
- No mortality related to POEM.

Results

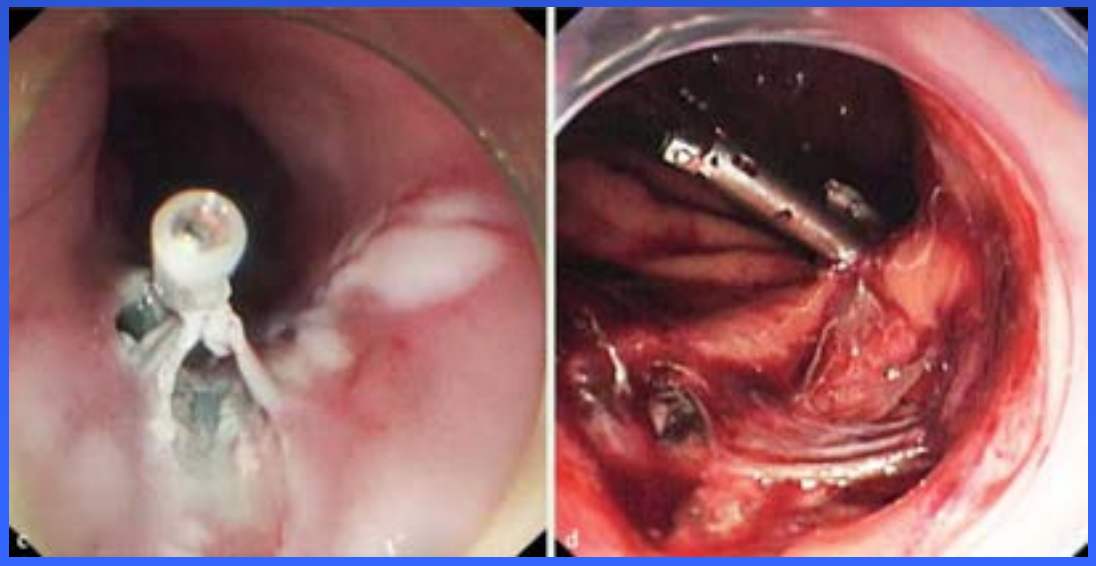

100
90
80
70
60
50
40
30
20
10
0
Percentage
5.9 %
19.9 %
72.2 %
Serevere
Moderate
Mild
Adverse Events

Results

Severe AEs 9 (5.9%)	n	%	Treatment
• Intraprocedure	4	2.6	
Bleeding	2	1.3	Taponade with a Segstaken-Blakemore tube (1/2) Surgery (1/2)
Cardiac Arrhytmhmia	1	0.65	
Esophageal perforation	1	0.65	Surgery
• First 48 hours	4	2.6	
Esophageal leak	2	1.3	Endoscopic therapy : clipping (1/2) Surgery (1/2)
Pneumomediastinum	1	0.65	Conservative treatment
Pneumonia	1	0.65	Conservative treatment
• After 48 hours	1	0.65	
Empyema	1	0.65	Surgery

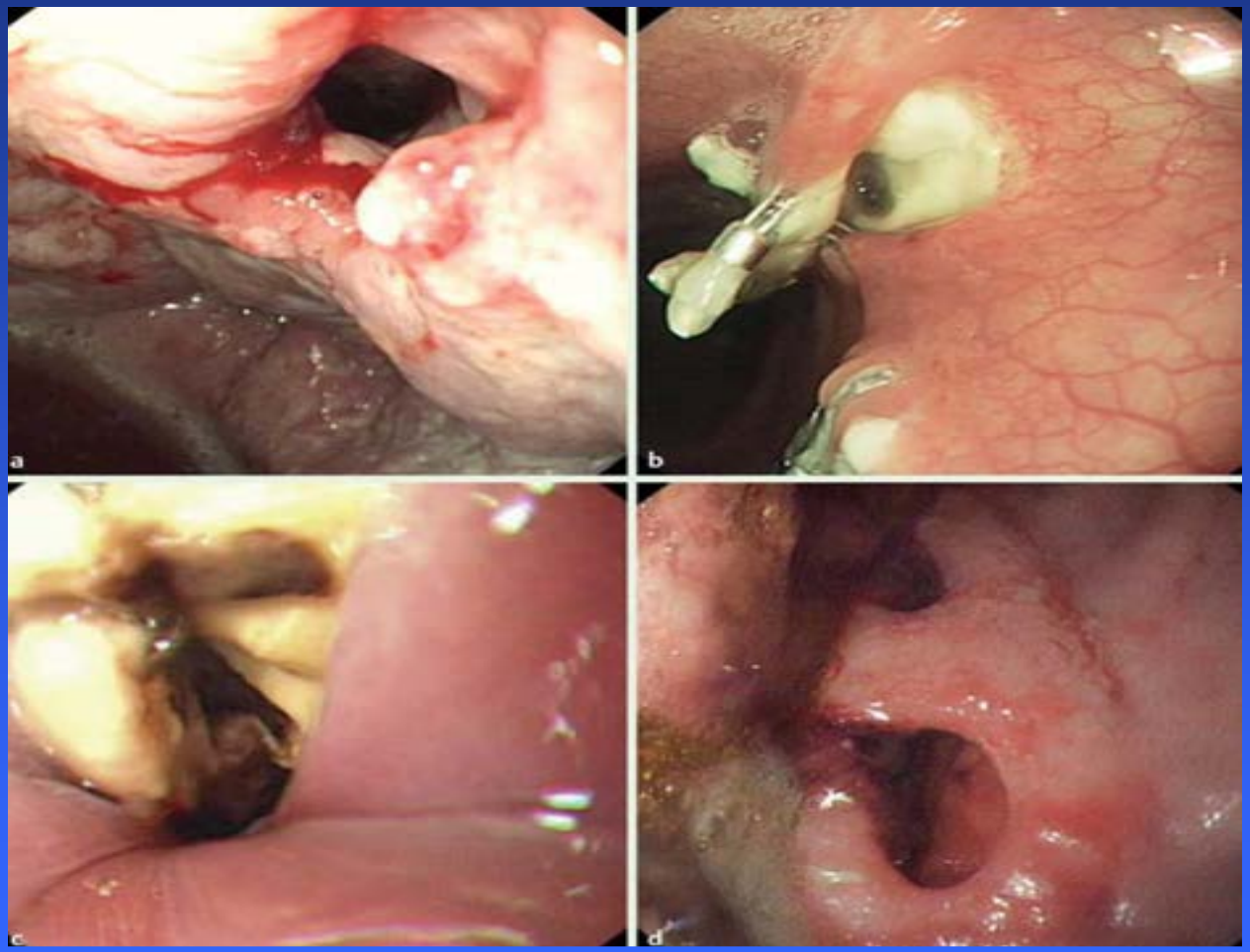


Type I mucosal injury



Type II mucosal injury

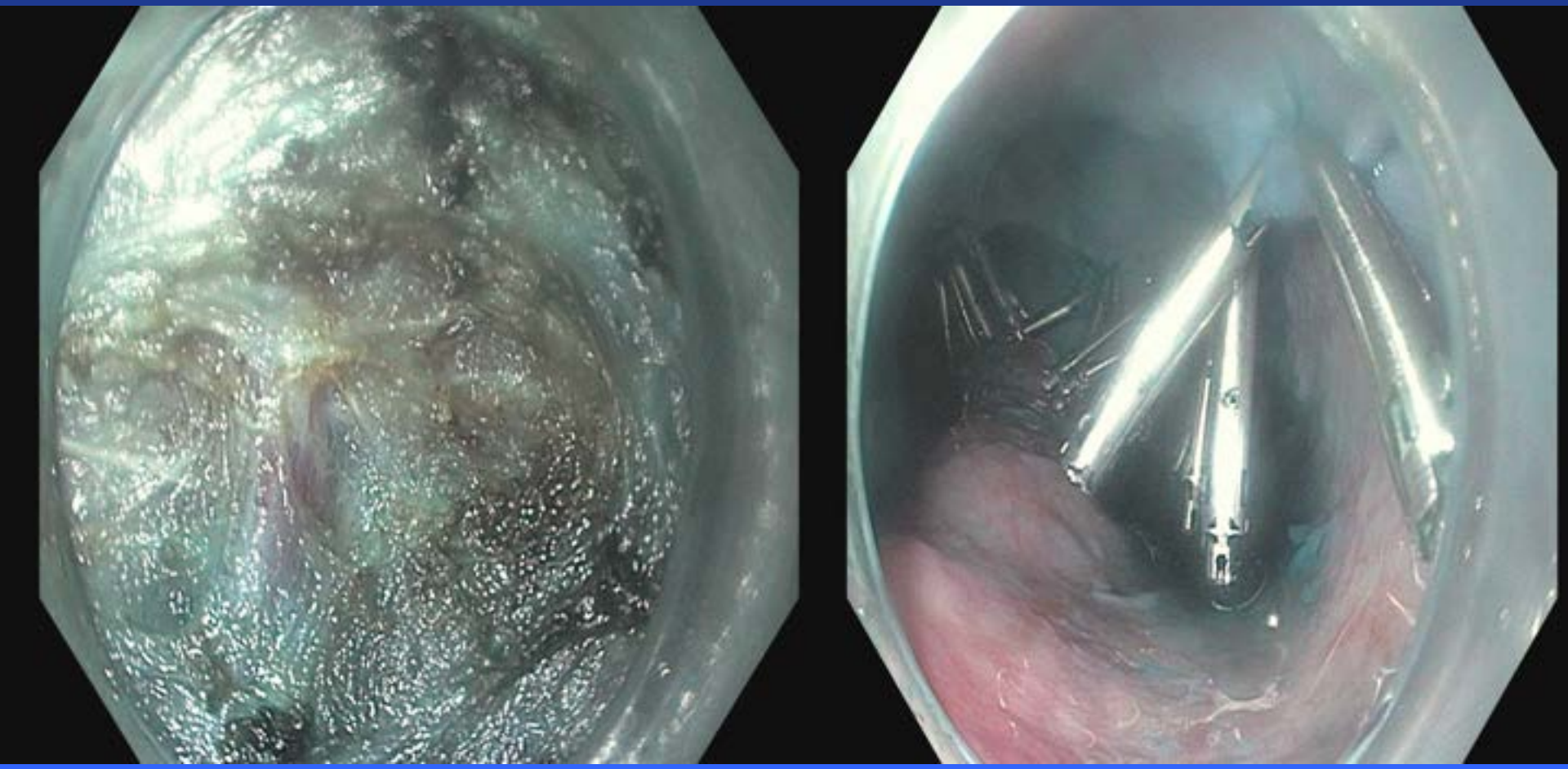
Delayed mucosal barrier failure



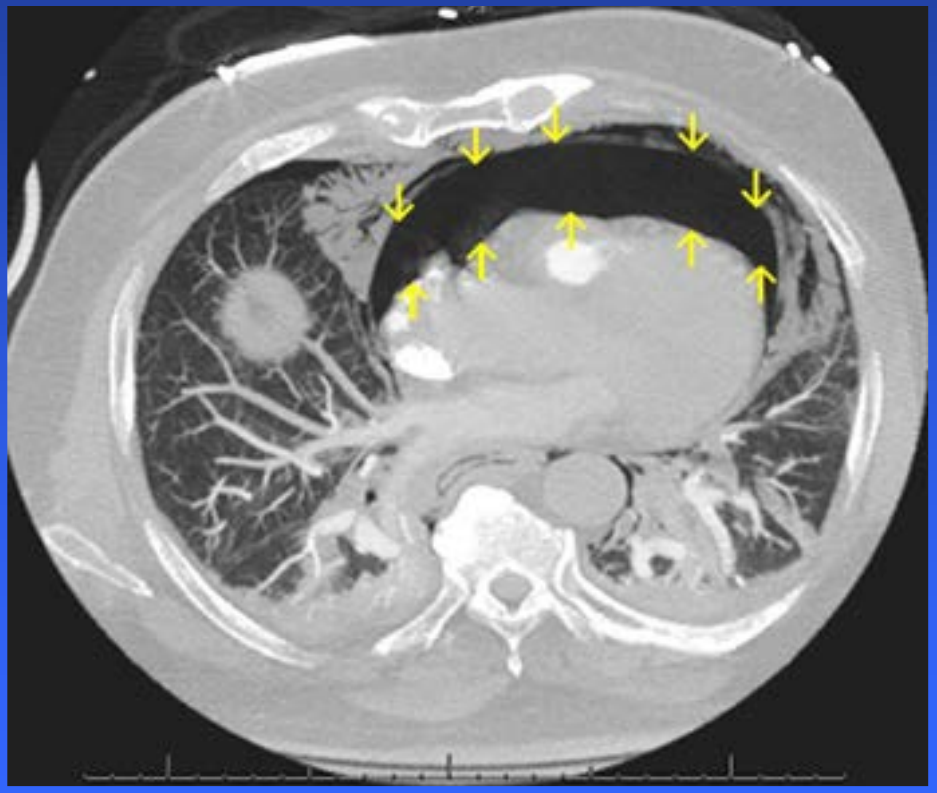
Mucosal injury at the cardia may occur and can be treated with clips (mucosotomy)

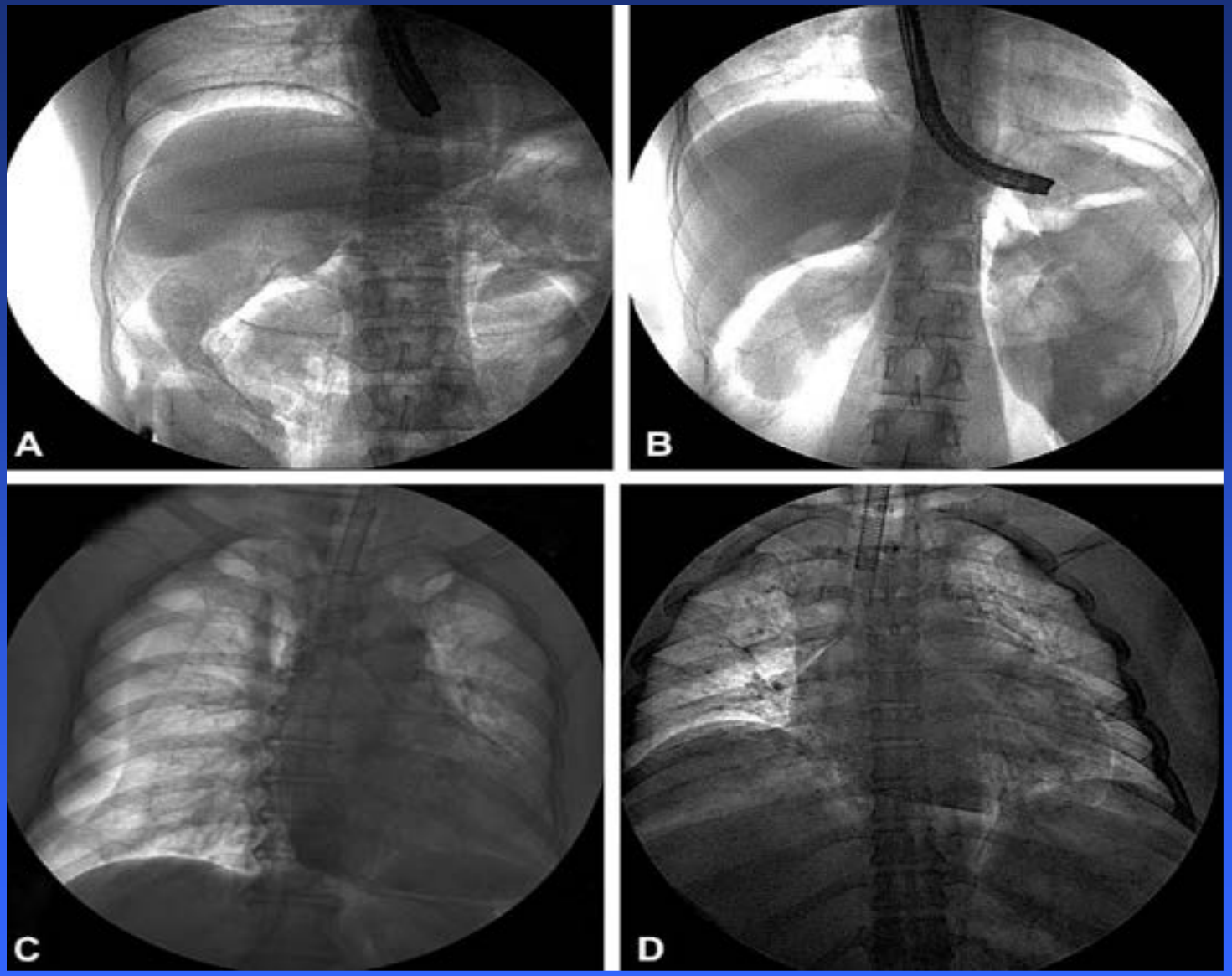
POEM - Bleeding

Extensive Submucosal Fibrosis



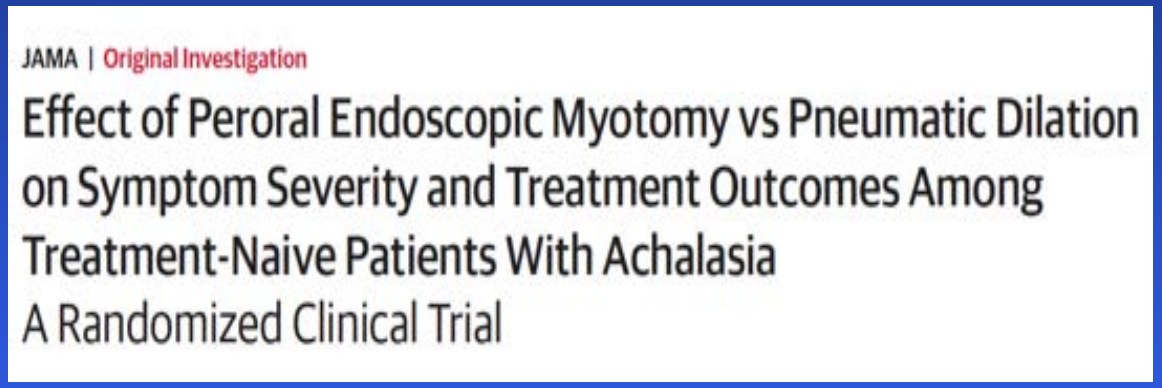
Cardiac arrest during POEM !!




A
B
C
D

Tension Pneumoperitoneum

PD or POEM?

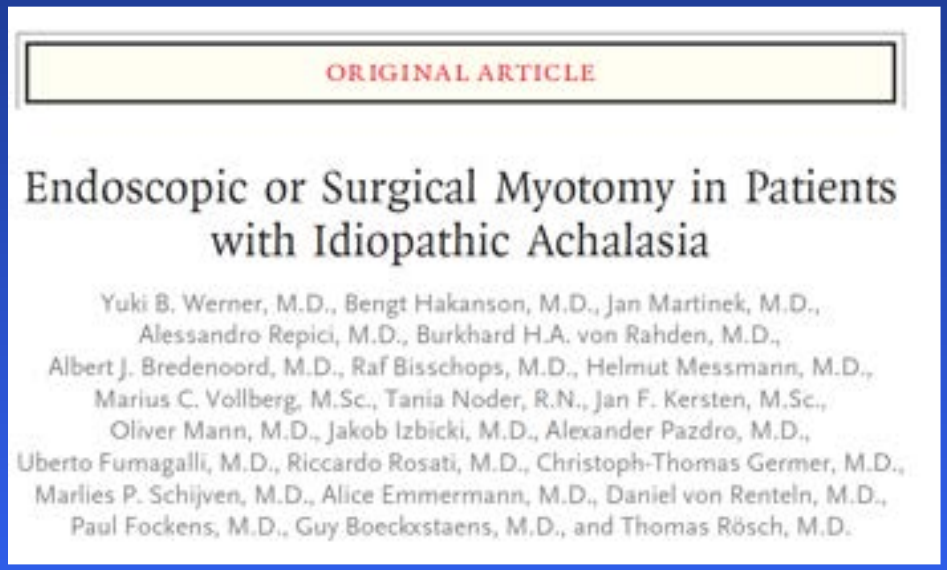


JAMA. 2019;322(2):134-144.

	POEM		Pneumatic Dilation		Unadjusted Absolute Difference, % (95% CI)[a]	Unadjusted Risk Ratio (95% CI)	P Value[b]
	No. (%)	SD	No. (%)	SD			
2-y Follow-up (primary end point)	(n = 63)		(n = 63)				
Overall treatment success	58 (92)	3.4	34 (54)	6.3	38 (22 to 52)	1.71 (1.34 to 2.17)	<.001
Reasons for failure[c]							
Eckardt score >3	5 (8)	3.4	28 (44)	6.2	36 (20 to 50)		<.001
Re-treatment	5 (8)	3.4	26 (41)	10.5	33 (17 to 47)		<.001
Treatment-related SAEs	0	0	1 (1.6)	1.6	1.6 (−5 to 10)		>.99
3-mo Follow-up (secondary end point)	(n = 64)		(n = 65)				
Overall treatment success	63 (98)	1.8	52 (80)	5	18 (7 to 30)	1.23 (1.09 to 1.40)	.001
Reasons for failure[c]							
Eckardt score >3	1 (2)	1.8	12 (18)	4.8	16 (5 to 29)		.002
Re-treatment	1 (2)	1.8	11 (17)	4.7	15 (4 to 27)		.004
Treatment-related SAEs	0	0	1 (2)	1.7	2 (−5 to 9)		>.99
1-y Follow-up (secondary end point)	(n = 64)		(n = 64)				
Overall treatment success	61 (95)	2.7	42 (66)	5.9	31 (17 to 45)	1.45 (1.21 to 1.75)	<.001
Reasons for failure[c]							
Eckardt score >3	3 (5)	2.7	21 (33)	5.9	28 (14 to 42)		<.001
Re-treatment	3 (5)	2.7	19 (30)	5.7	25 (11 to 38)		<.001
Treatment-related SAEs	0	0	1 (1.6)	1.6	2 (−5 to 9)		>.99

Endoscopic reflux esophagitis[e]	(n = 54)	(n = 29)		
No. (%)	22 (41)	2 (7)	34 (12 to 49)	.002 (.03)
SD	6.5	4.7		
Grade, No. (%)				
A	17 (31)	2 (7)		
B	2 (4)	0		
C	3 (6)	0		
D	0	0		
PPI use, No (%)	24 (41)	7 (21)	20 (1 to 38)	.004 (.04)
SD	6.5	7		
Reflux esophagitis, No. (%)	10 (42)	0		
No reflux esophagitis, No. (%)	14 (58)	7 (100)		

LHM or POEM



ORIGINAL ARTICLE

Endoscopic or Surgical Myotomy in Patients with Idiopathic Achalasia

Yuki B. Werner, M.D., Bengt Hakanson, M.D., Jan Martinek, M.D., Alessandro Repici, M.D., Burkhard H.A. von Rahden, M.D., Albert J. Bredenoord, M.D., Raf Bisschops, M.D., Helmut Messmann, M.D., Marius C. Vollberg, M.Sc., Tania Noder, R.N., Jan F. Kersten, M.Sc., Oliver Mann, M.D., Jakob Izbicki, M.D., Alexander Pazdro, M.D., Uberto Fumagalli, M.D., Riccardo Rosati, M.D., Christoph-Thomas Germer, M.D., Marlies P. Schijven, M.D., Alice Emmermann, M.D., Daniel von Renteln, M.D., Paul Fockens, M.D., Guy Boeckxstaens, M.D., and Thomas Rösch, M.D.

N Engl J Med 2019;381:2219-29

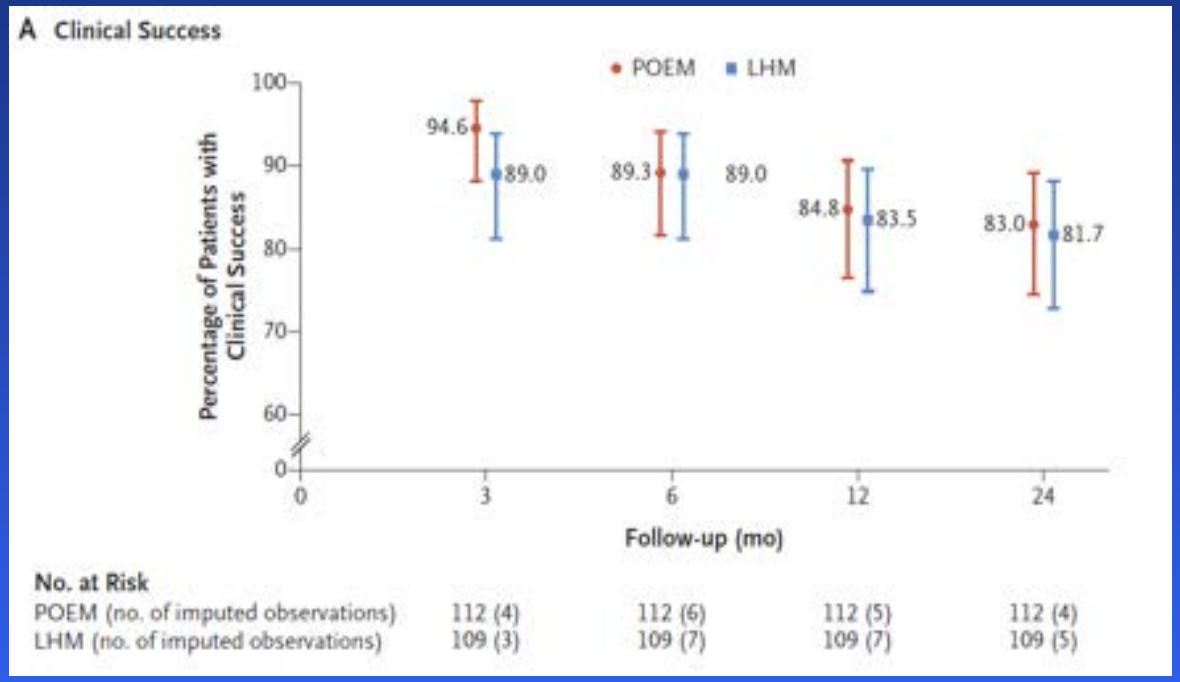
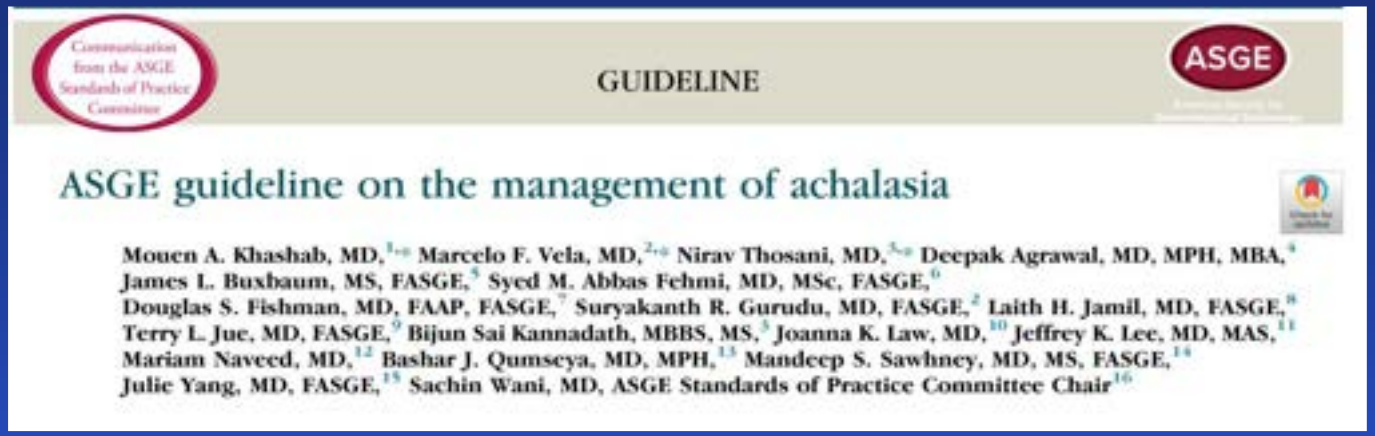

A Clinical Success
POEM
LHM
Percentage of Patients with Clinical Success
100
90
80
70
60
0
94.6
89.0
89.3
89.0
84.8
83.5
83.0
81.7
0
3
6
12
24
Follow-up (mo)
No. at Risk
POEM (no. of imputed observations) 112 (4) 112 (6) 112 (5) 112 (4)
LHM (no. of imputed observations) 109 (3) 109 (7) 109 (7) 109 (5)

Table 2. Clinical and Objective Evaluation of Gastroesophageal Reflux Disease (a Secondary End Point) over Time.*

Measure	3 Months		2 Years	
	POEM Group (N=112)	LHM Group (N=109)	POEM Group (N=112)	LHM Group (N=109)
Clinical scores				
Mean DeMeester clinical score (95% CI)	0.9 (0.6–1.1)	0.5 (0.3–0.7)	1.2 (0.9–1.5)	1.0 (0.6–1.0)
Daily reflux symptoms — no./total no. (%)	5/108 (4.6)	2/105 (1.9)	7/107 (6.5)	2/103 (1.9)
Occasional reflux symptoms — no./total no. (%)	42/108 (38.9)	29/105 (27.6)	49/107 (45.8)	45/103 (43.7)
Daily proton-pump inhibitor use — no./total no. (%)	25/108 (23.1)	16/105 (15.2)	41/106 (38.7)	20/103 (19.4)
Occasional proton-pump inhibitor use — no./total no. (%)	8/108 (7.4)	13/105 (12.4)	15/106 (14.2)	8/103 (7.8)
LA Classification grade of reflux esophagitis — no./total no. (%)†				
Overall, grades A to D	57/100 (57)	19/96 (20)	38/87 (44)	23/78 (29)
Grade A	32/100 (32)	13/96 (14)	18/87 (21)	13/78 (17)
Grade B	19/100 (19)	3/96 (3)	16/87 (18)	5/78 (6)
Grade C	5/100 (5)	2/96 (2)	4/87 (5)	2/78 (3)
Grade D	1/100 (1)	1/96 (1)	0/87	3/78 (4)
Esophageal acid exposure‡				
Mean acid exposure time (95% CI) — %	7.1 (5.4–8.9)	6.7 (4.1–9.3)	5.7 (2.8–8.5)	5.4 (2.2–8.5)
Acid exposure time >4.5% — no./total no. (%)	41/93 (44)	27/82 (33)	21/70 (30)	17/56 (30)



GUIDELINE

ASGE guideline on the management of achalasia

Mouen A. Khashab, MD,[1,*] Marcelo F. Vela, MD,[2,*] Nirav Thosani, MD,[3,*] Deepak Agrawal, MD, MPH, MBA,[4] James L. Buxbaum, MS, FASGE,[5] Syed M. Abbas Fehmi, MD, MSc, FASGE,[6] Douglas S. Fishman, MD, FAAP, FASGE,[7] Suryakanth R. Gurudu, MD, FASGE,[2] Laith H. Jamil, MD, FASGE,[8] Terry L. Jue, MD, FASGE,[9] Bijun Sai Kannadath, MBBS, MS,[3] Joanna K. Law, MD,[10] Jeffrey K. Lee, MD, MAS,[11] Mariam Naveed, MD,[12] Bashar J. Qumseya, MD, MPH,[13] Mandeep S. Sawhney, MD, MS, FASGE,[14] Julie Yang, MD, FASGE,[15] Sachin Wani, MD, ASGE Standards of Practice Committee Chair[16]

Gastrointest Endosc 2020;91:213-27

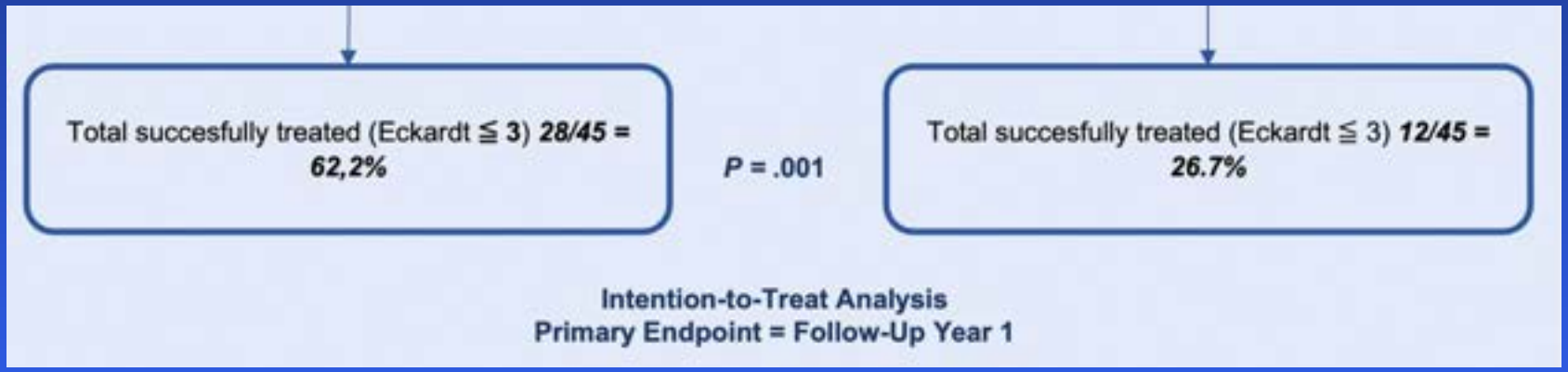
1. Laparoscopic Heller myotomy, pneumatic dilation, and POEM are effective therapeutic modalities for patients with achalasia. Decision between these treatment options should depend on achalasia type, local expertise, and patient preference. ⊕⊕⊕⊕

2. We recommend against the use of botulinum toxin injection as definitive therapy for achalasia patients. Botulinum toxin injection may be reserved for patients who are not candidates for other definitive therapies. ⊕⊕⊕◯

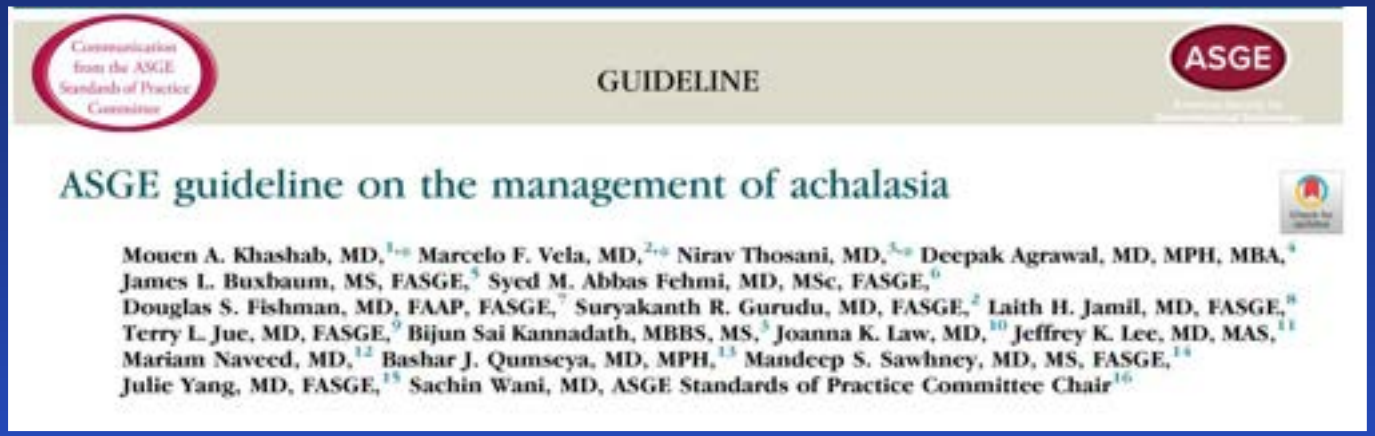
The Efficacy of Peroral Endoscopic Myotomy vs Pneumatic Dilation as Treatment for Patients With Achalasia Suffering From Persistent or Recurrent Symptoms After Laparoscopic Heller Myotomy: A Randomized Clinical Trial

Caroline M. G. Saleh, Pietro Familiari, Barbara A. J. Bastiaansen, Paul Fockens, Jan Tack, Guy Boeckxstaens, Raf Bisschops, Aaltje Lei, Marlies P. Schijven, Jan Guido Costamagna, and Albert J. Bredenoord

Gastroenterology 2023



Variable	POEM, n (%)	PD, n (%)	*P* Value[a]
Reflux esophagitis (n = 75)	12/35 (34.3)	6/40 (15)	.062
Grade A	7/35 (20)	4/40 (10)	NA
Grade B	4/35 (11.4)	1/40 (2.5)	NA
Grade C	1/35 (2.9)	1/40 (2.5)	NA
Grade D	0 (0)	0 (0)	NA
PPI use (n = 87)	29 (69)	26 (57.8)	0.374



GUIDELINE

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Gastrointest Endosc 2020;91:213-27

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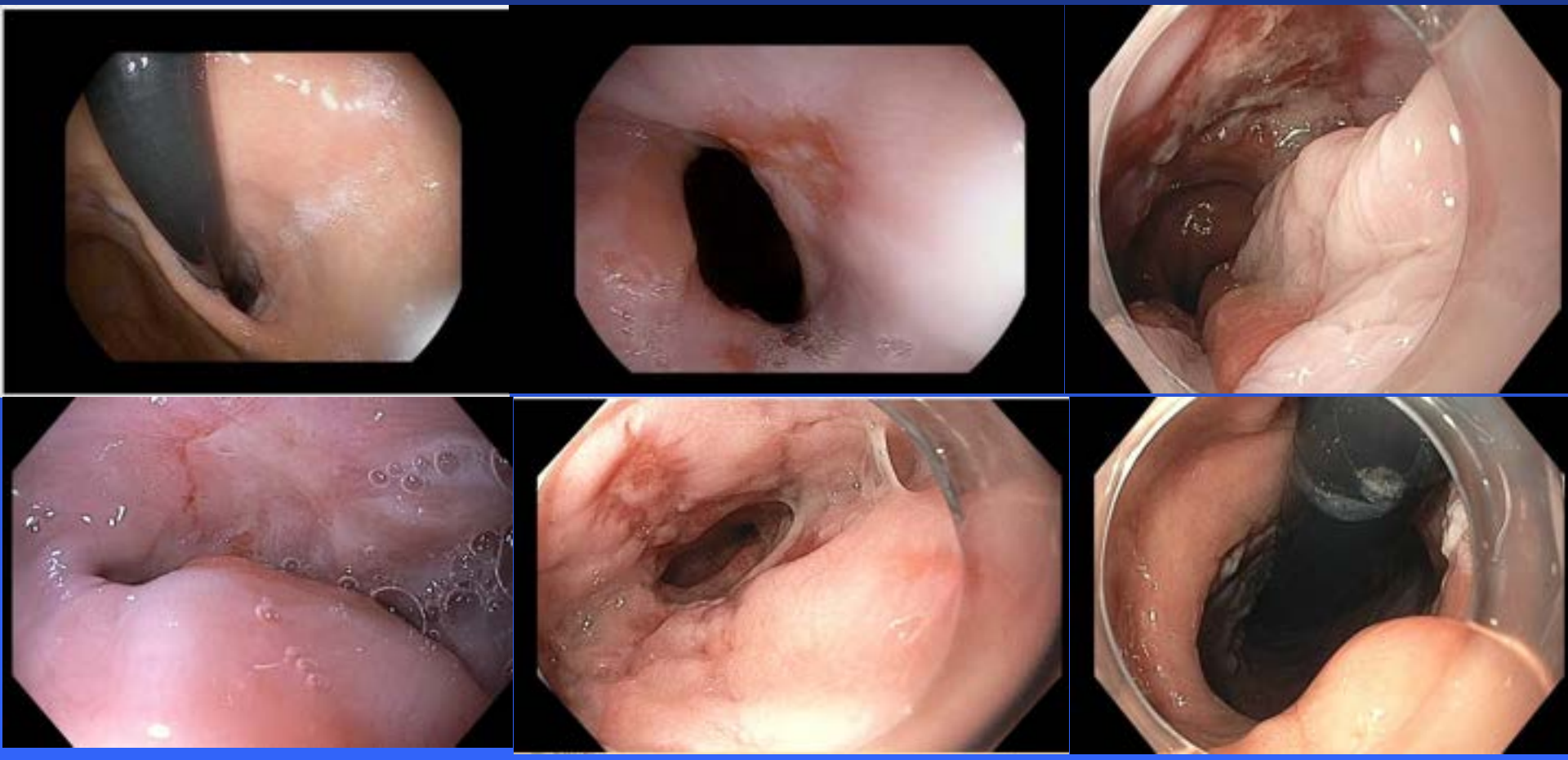
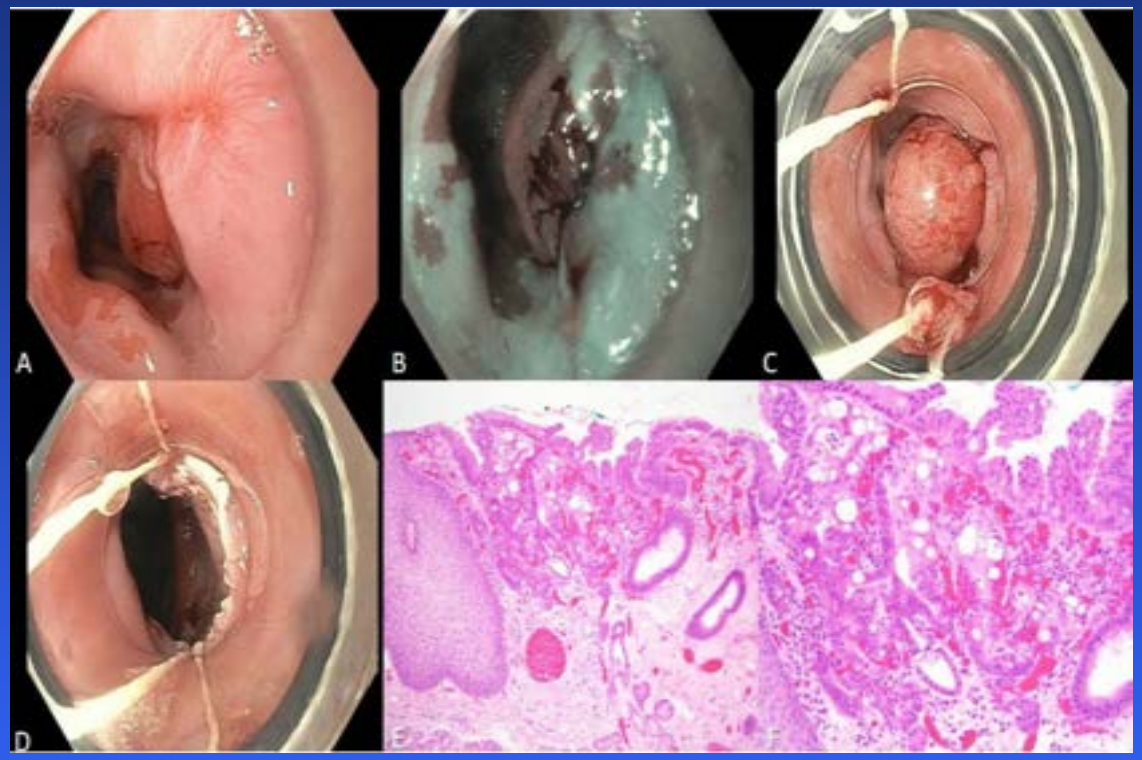
2. We recommend against the use of botulinum toxin injection as definitive therapy for achalasia patients. Botulinum toxin injection may be reserved for patients who are not candidates for other definitive therapies. ⊕⊕⊕◯

Post POEM GERD





Ichkhanian, Benias, Khashab. Gut 2019;68:2107–2110

What is your recommended treatment?

a. Dietary modification alone
b. Calcium channel blocker alone
c. Botulinum toxin injection
d. Pneumatic dilation to 30-35mm
e. Heller Myotomy with partial fundoplication
f. POEM
g. POEM-F

POEM-F (part 1)

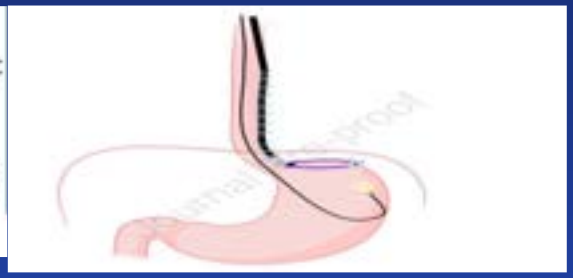
POEM-F

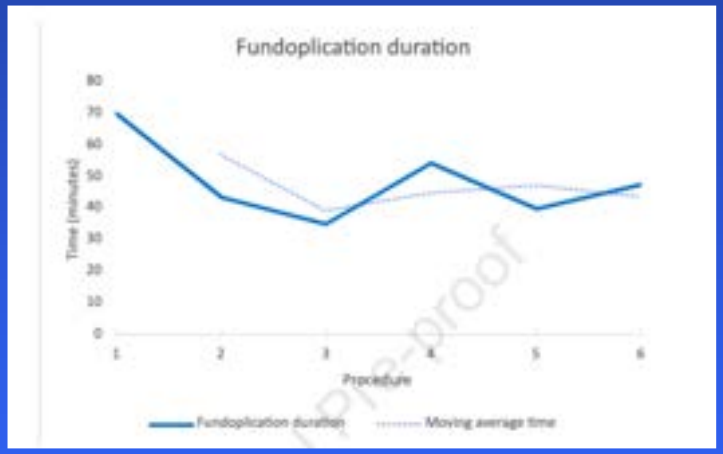
EndoFlip

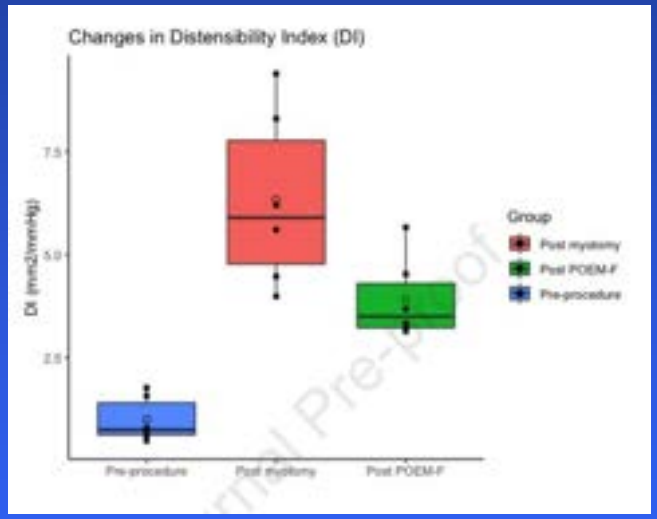
	Diameter	CSA	Pressure	DI	Compliance
Baseline	5	20	26.4	0.8	59.7
After myotomy	14.4	162	17.7	9.4	222.6
After fundoplication	11.1	97	29.9	3.2	89.1

Technical Details and Outcomes of Peroral Endoscopic Myotomy with Fundoplication: The First U.S. Experience.

Apurva Shrigiriwar, MD, Linda Y. Zhang, MD, Bachir Ghandour, MD, Michael Bejjani, MD, Shruti Mony, MD, Amol Bapaye, MD (MS), FASGE, FSGEI, FISG, FJGES, Mouen A. Khashab, MD, MASGE







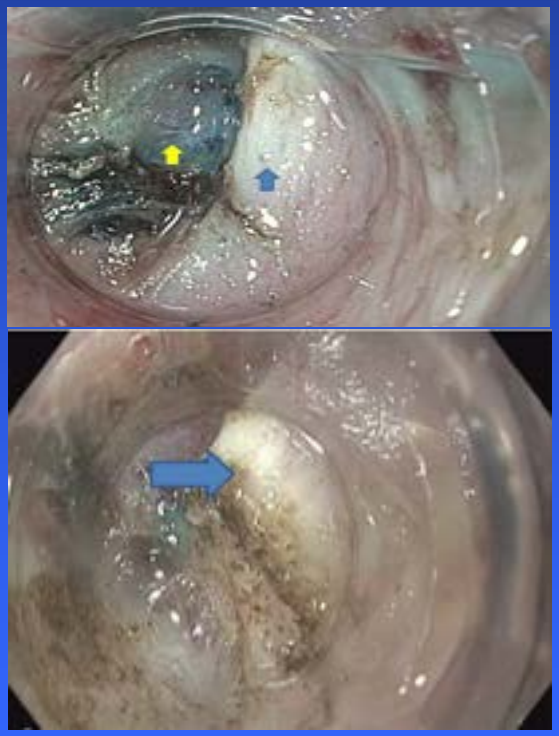
GIE 2023

G-POEM

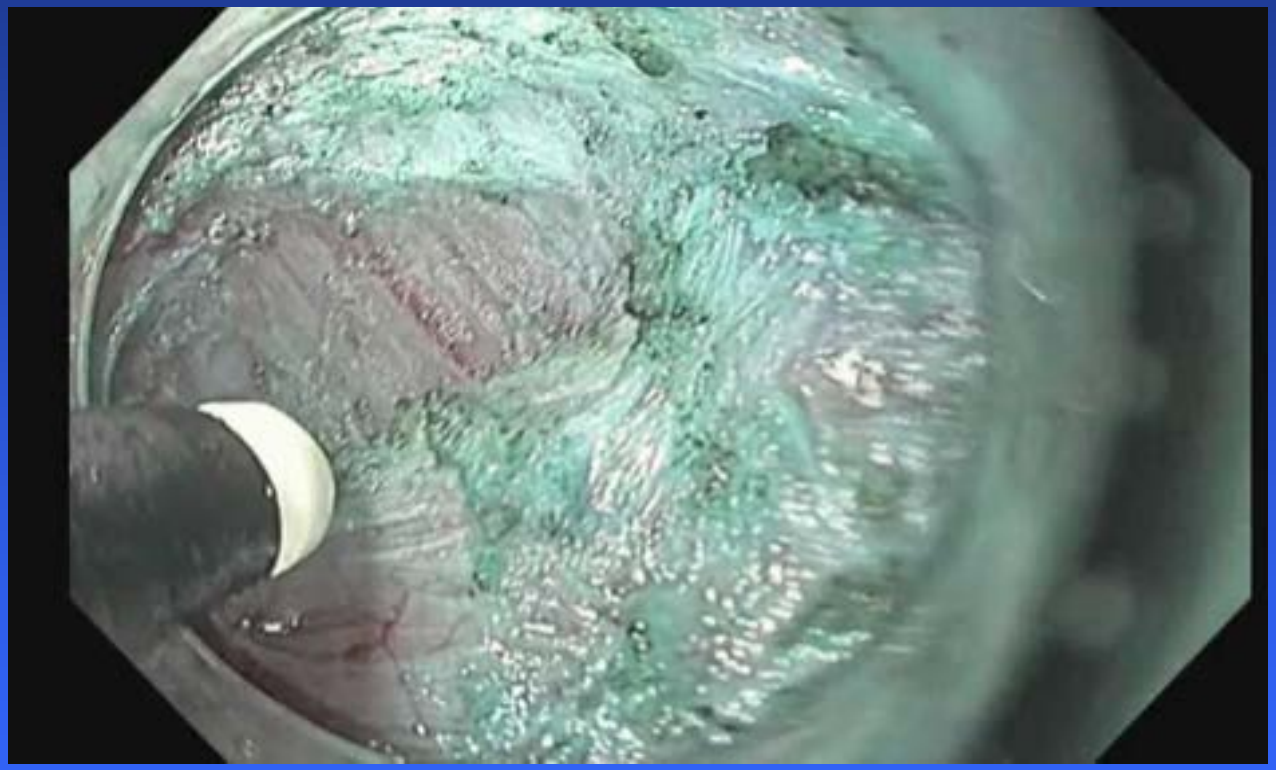
THINKING OUTSIDE THE BOX

Gastric peroral endoscopic myotomy for refractory gastroparesis: first human endoscopic pyloromyotomy (with video)

Khashab et al. 2013 Nov;78(5):764-8



G- POEM

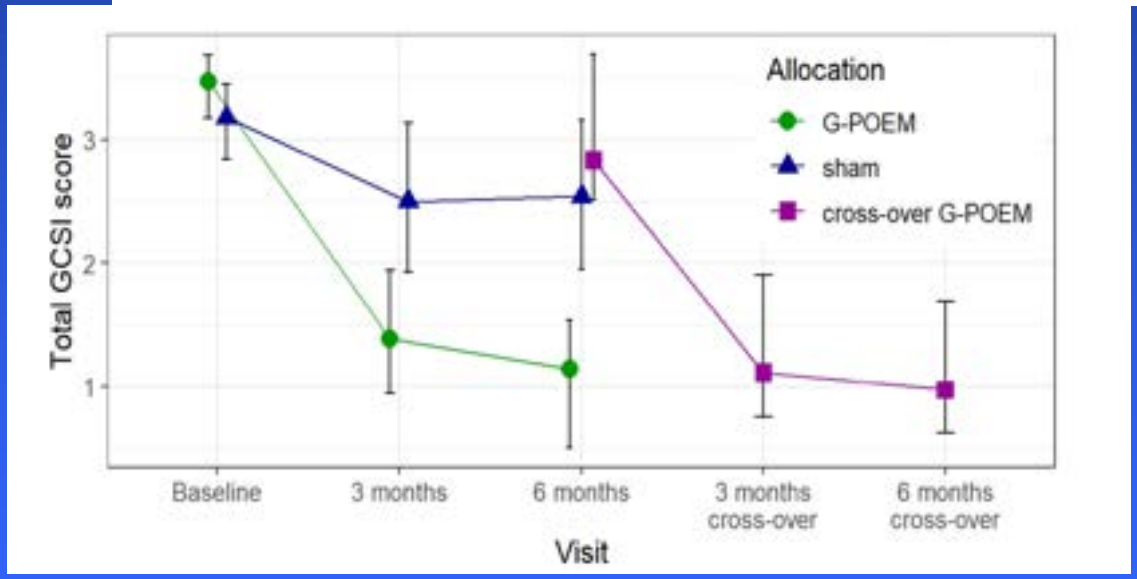


Double G-POEM

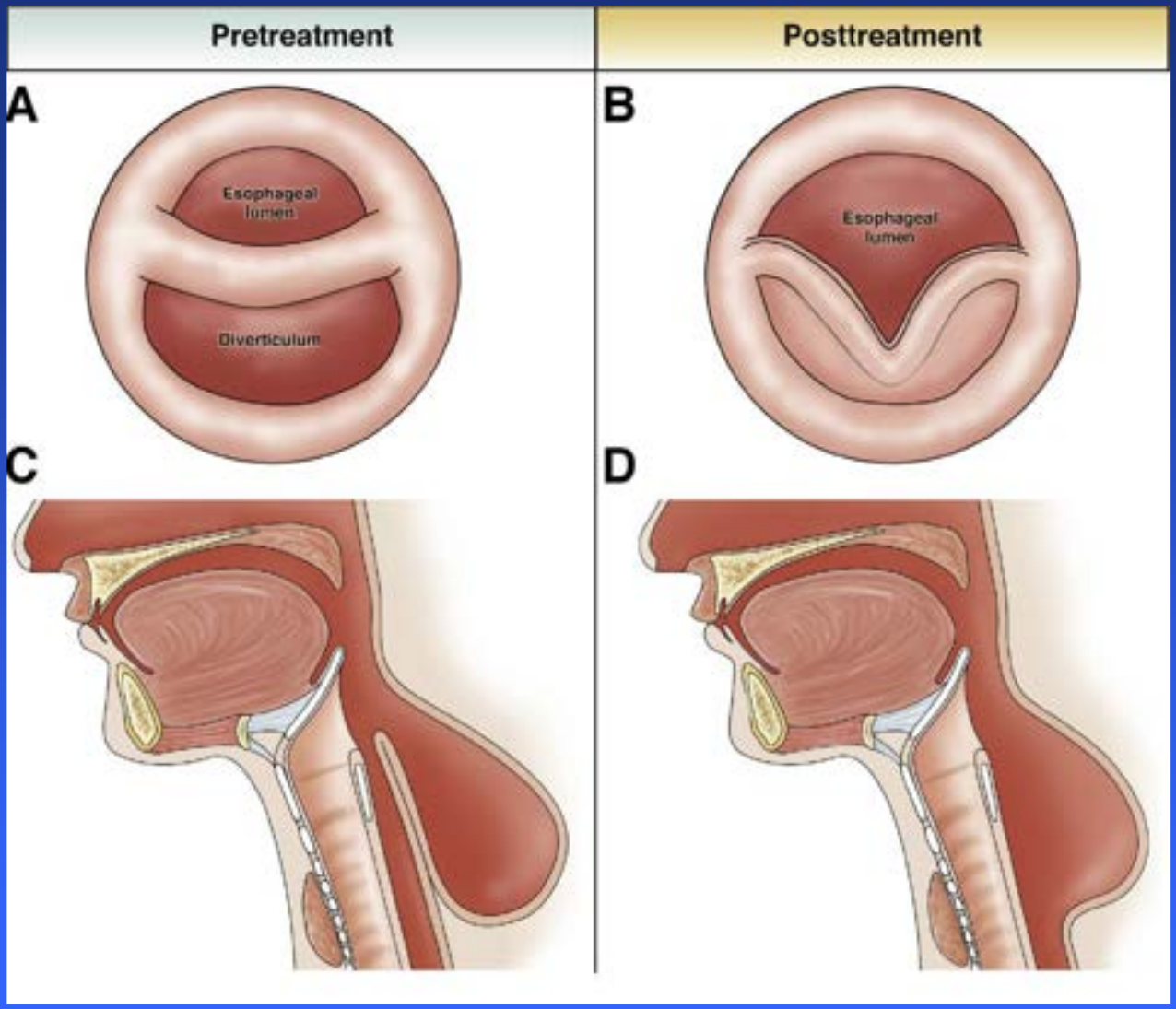
G-POEM

Endoscopic pyloromyotomy for the treatment of severe and refractory gastroparesis: a pilot, randomised, sham-controlled trial

Jan Martinek [1], Rastislav Hustak [2,3], Jan Mares [4], Zuzana Vackova [1], Julius Spicak,[1] Eva Kieslichova,[5] Marie Buncova,[6] Daniel Pohl [7], Sunil Amin [8], Jan Tack [9]



Z POEM


Pretreatment
Posttreatment
A
Esophageal lumen
Diverticulum
B
Esophageal lumen
C
D

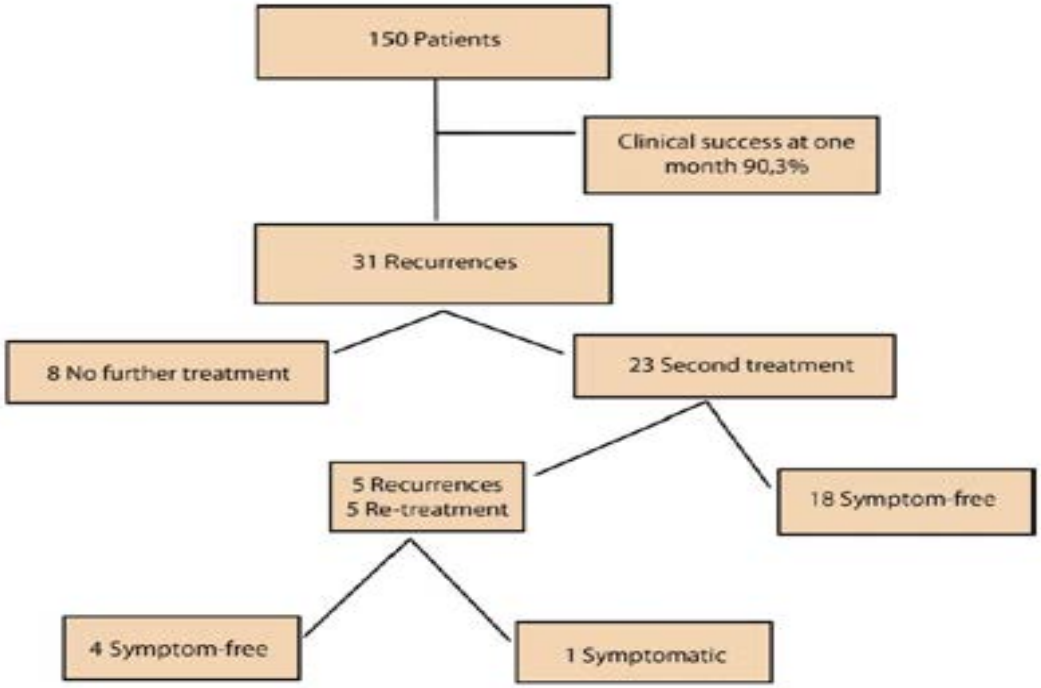
ORIGINAL ARTICLE: Clinical Endoscopy

Endoscopic treatment for Zenker's diverticulum: long-term results (with video)

Vincent Huberty, MD,[1] Souraya El Bacha, MD,[1] Daniel Blero, MD, PhD,[1] Olivier Le Moine, MD, PhD,[1] Sergio Hassid, MD, PhD,[2] Jacques Devière, MD, PhD[1]

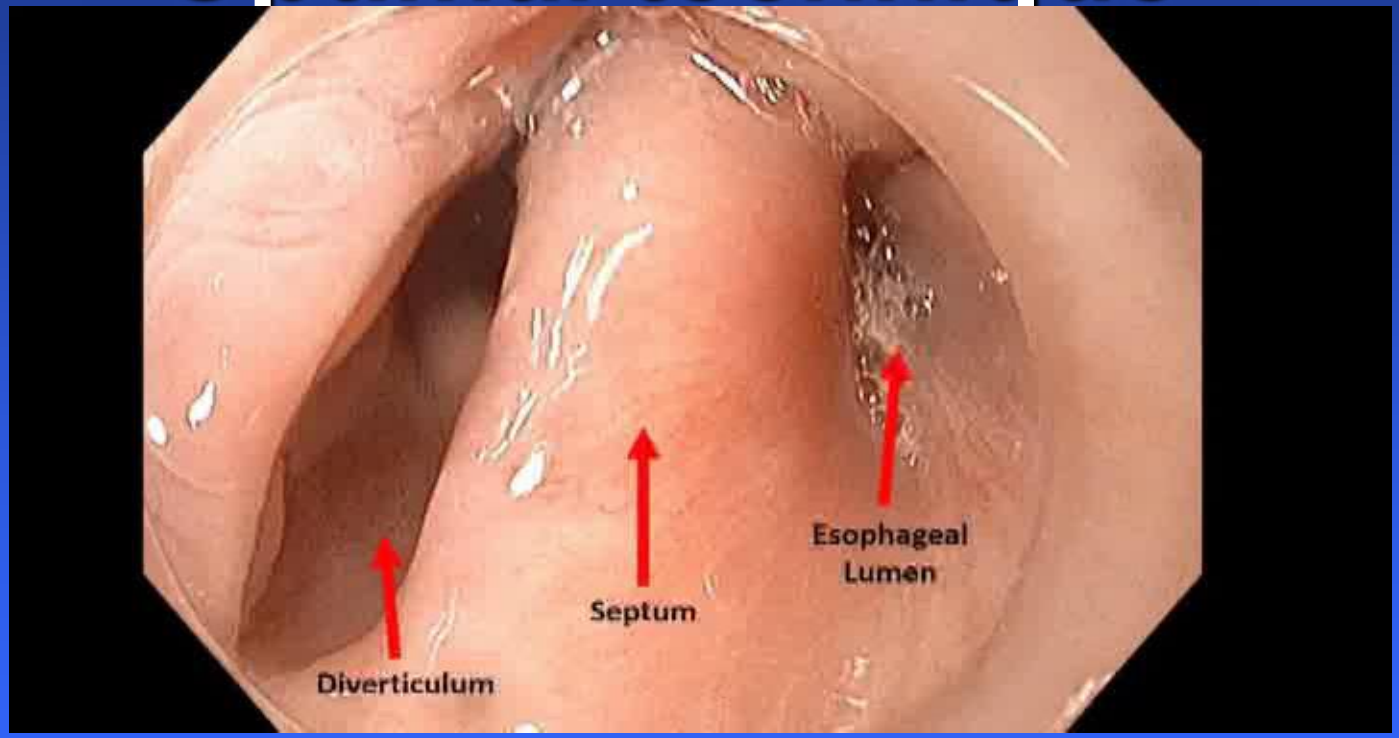
Brussels, Belgium

Gastrointest Endosc 2013;77:701-7.

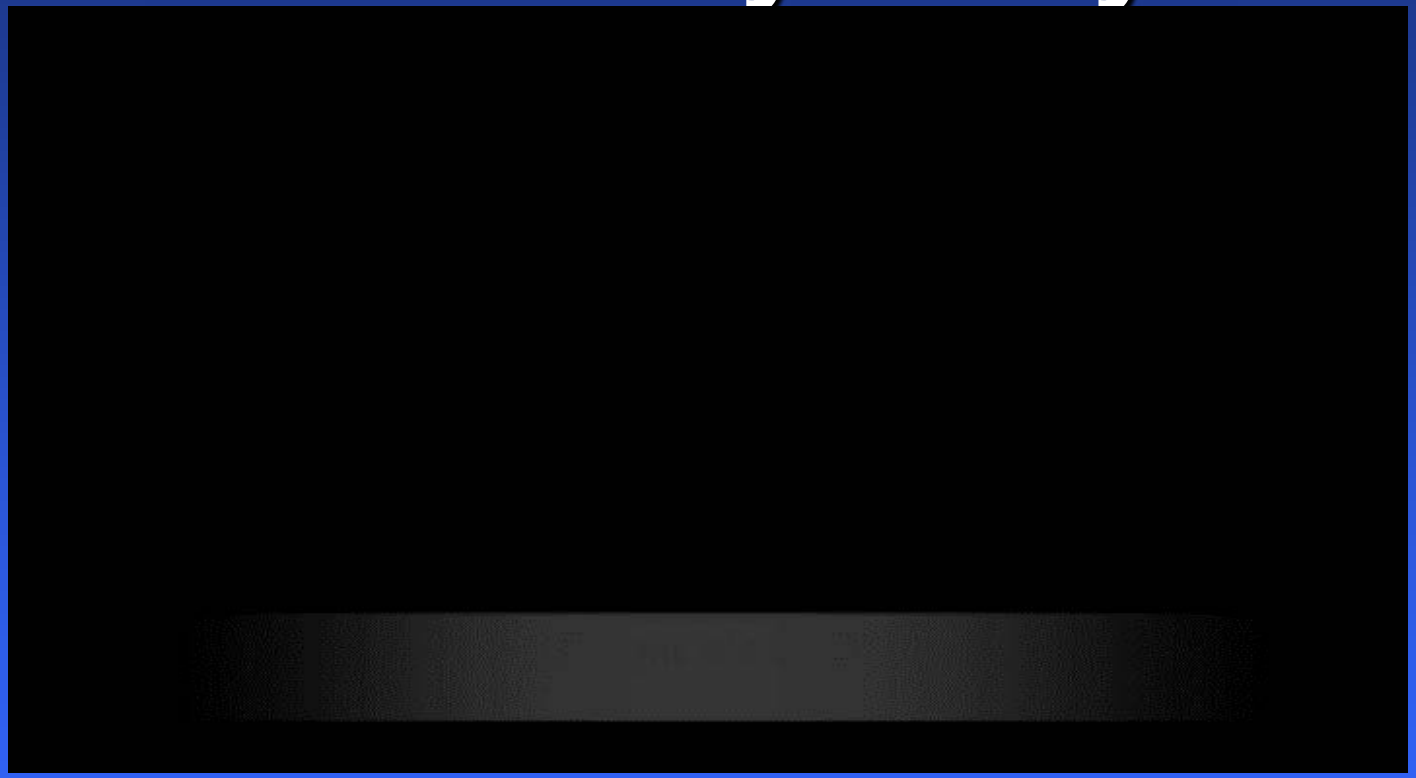


Recurrence rate: 23%

Z-POEM
Optimal technique



CP Bar Myotomy



Z-POEM + MFI

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

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	N=75
Clinical success %(n)	92% (69)
Technical success %(n)	97.3% (73)
Mean POEM procedure time (min) (mean±std)	52.4±2.9
Repeat interventions	
Surgical interventions (n)	0
Endoscopic interventions (n)	1
Post-procedure follow-up days (median, IQR)	291.5 (IQR 103.5-436)
Days of hospitalization (mean±std)	1.8±0.2
Preprocedure dysphagia score (mean±std)	1.96±0.68
Postprocedure dysphagia score (mean±std)	0.25±0.52

GIE 2019

Comparison of Zenker's Diverticulum Treatment Using Peroral Endoscopic Myotomy and Flexible Endoscopy Septotomy. (ZIPPY)

Conclusions

- Third Space Endoscopy → Exciting results
- POEM is safe and effective in the management of achalasia/GP
- Severe adverse events are uncommon but may occur
- Z POEM is a promising technique for the management of symptomatic Zenker's Diverticula.

Thank you