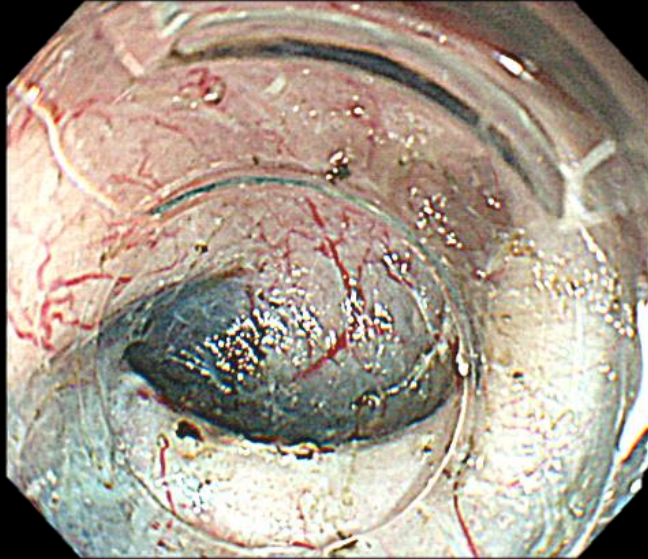


Disappearing borders between luminal surgery and **Interventional Endoscopy**: current advance in **third and fourth space** endoscopy



Sz-luan Shiu, Asst. Prof.

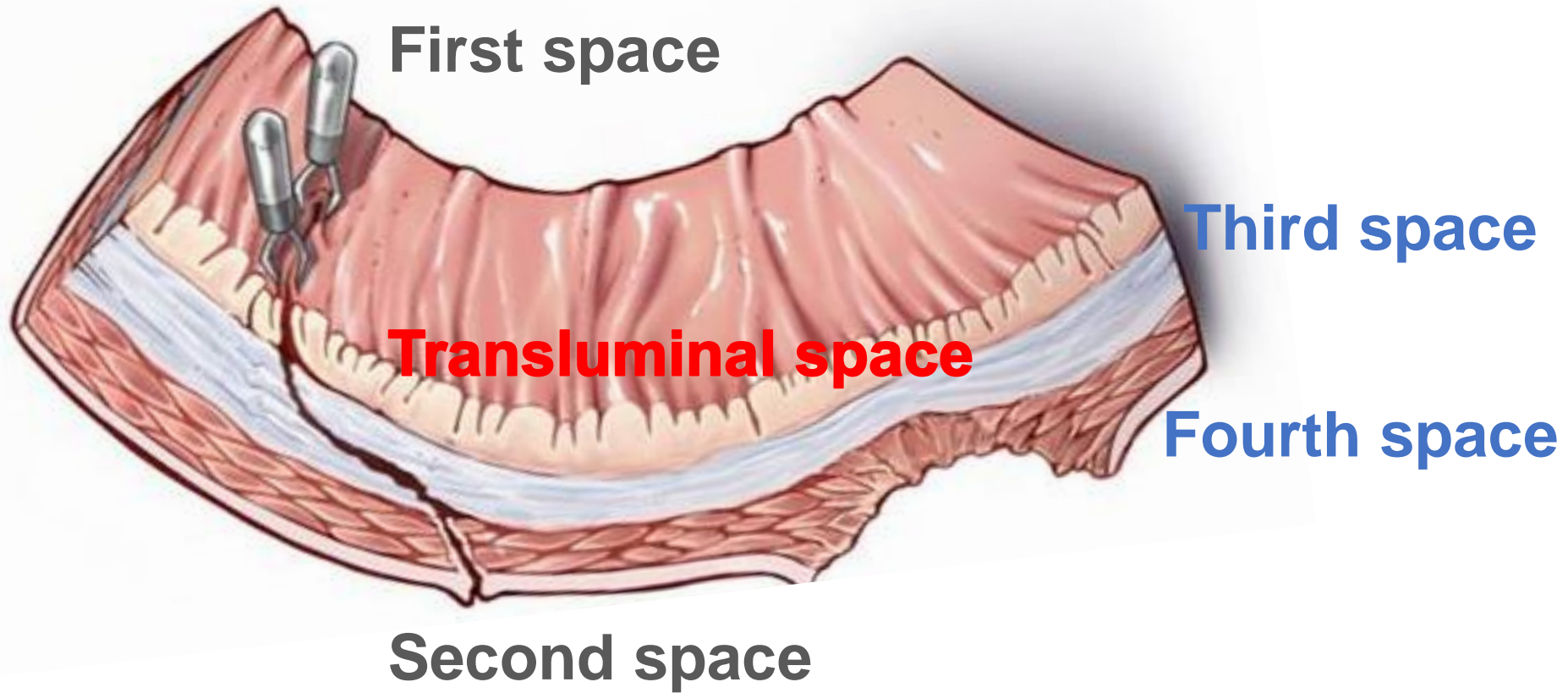
Division of Gastroenterology and Hepatology

Department of Critical Care Medicine

Deputy Executive Secretary,

Evidence-based Practice and Policymaking Committee

Taichung Veterans General Hospital, Taiwan



Configuration of Space

Third-space endoscopy

Zenker's diverticulum

Z-POEM or D-POEM

Idiopathic achalasia

POEM

Esophageal stricture

POETRE

Refractory gastroparesis

G-POEM or POP

Subepithelial lesion

STER POET

Classification

Endoscopist

All GI tract
ENT/CS/GS/CRS

Benign lesion to
early stage/
non-infection

Ambiguous
(Spatial disorientation)

One channel
Natural orifice

Hemostasis/
Wound closure

Distribution

Indication

Anatomy

Technique

Difficulty

Surgeon

GI tract + Organ
MDT

Benign/Infection
/metastases

Well-defined

Multiple arms
Multi-incisions

Multi-faceted

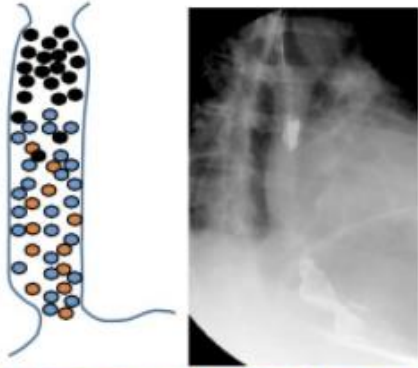
Esophageal motility disorder typified by **insufficient relaxation of the lower esophageal sphincter** in the setting of **absent peristalsis**.

Annual incidence **1.07-1.99/100,000** while reported prevalence **10.8-27.1/100,000**

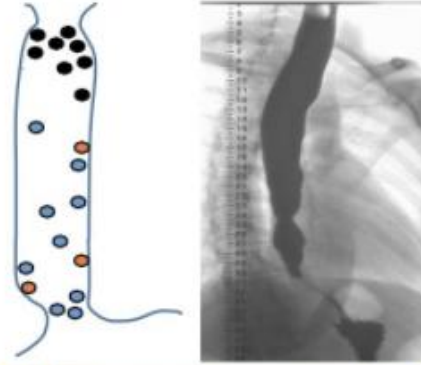
Achalasia is associated with **increased overall mortality** and **higher incidence of esophageal cancer** globally.

Idiopathic Achalasia

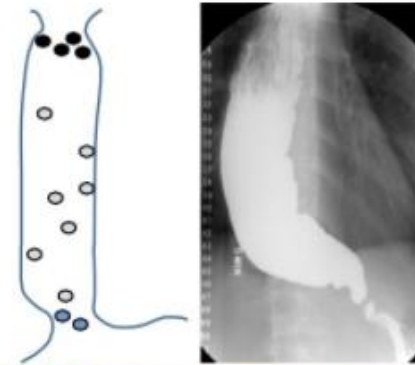
A:EGJ Outflow Obstruction



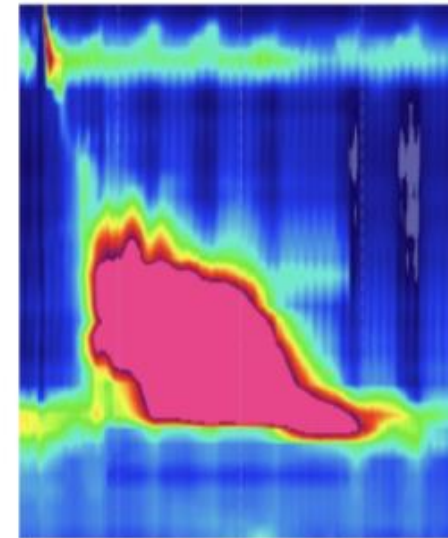
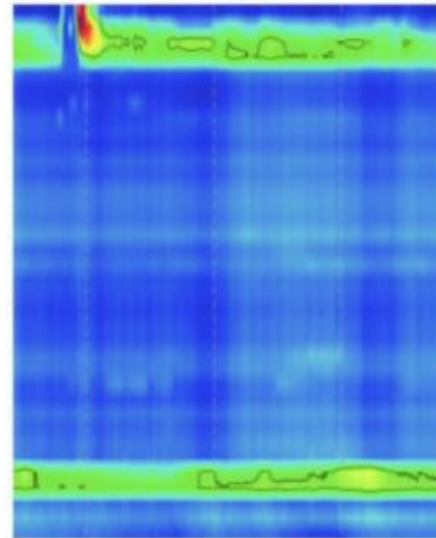
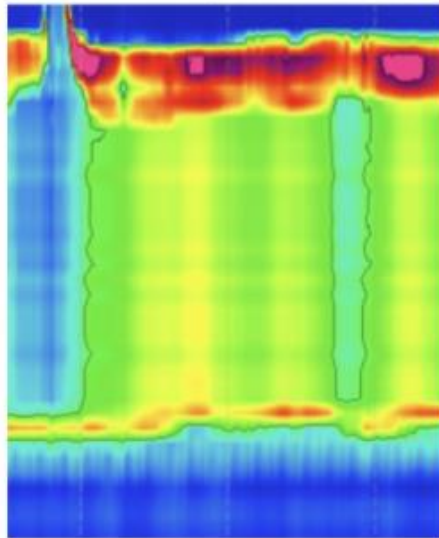
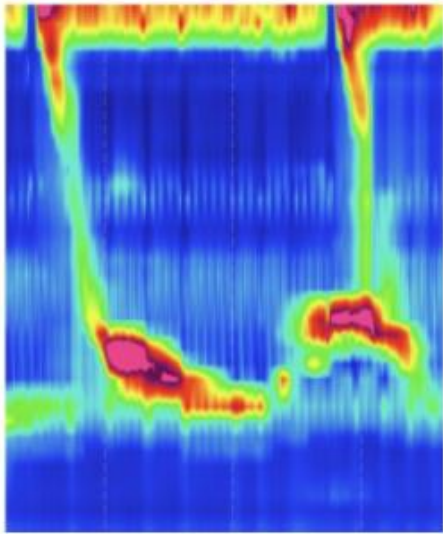
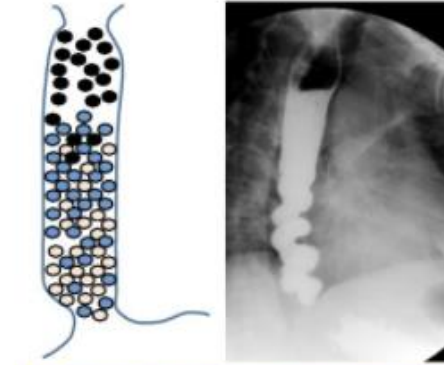
B:Type II Achalasia



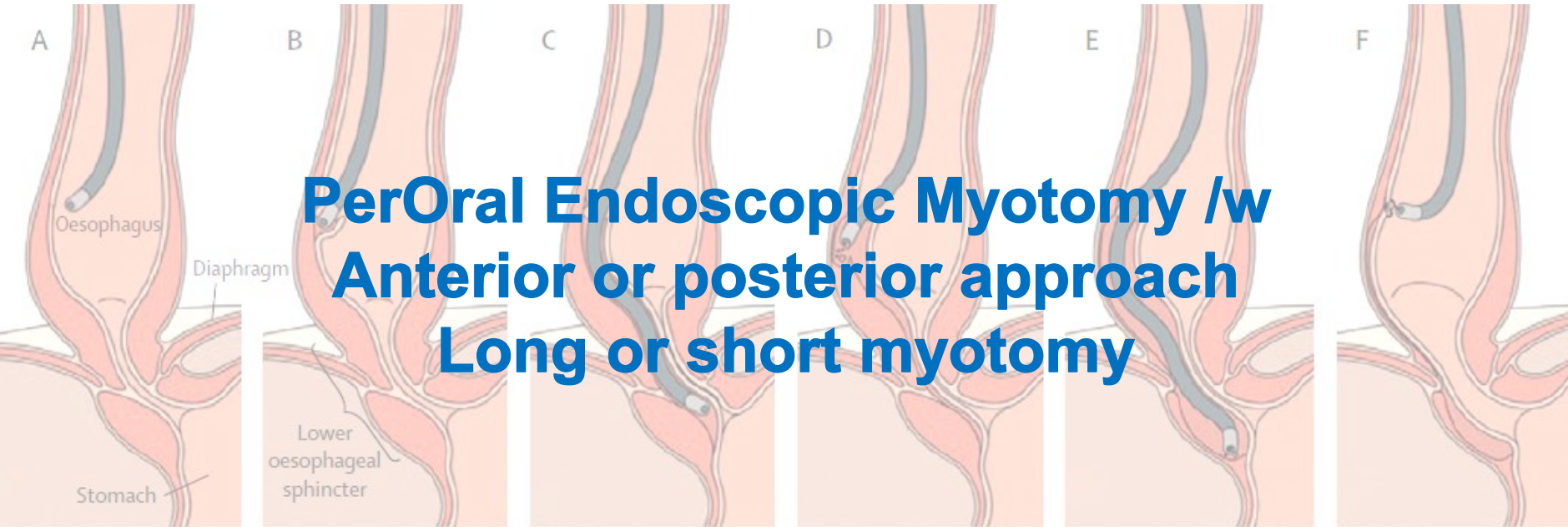
C:Type I Achalasia



D:Type III achalasia



**PerOral Endoscopic Myotomy /w
Anterior or posterior approach
Long or short myotomy**



**Laparoscopic Heller's Myotomy /w
Anterior (Dor) or posterior (Toupet) approach**



POEM

LHM

Anterior or
Posterior

Procedure

Dor or Toupet
approach

Type I-III, esp. III

Indication

Type I-II

Longer at
esophageal side

Myotomy Length

Longer at
gastric side

Fundoplication
(elective)

GERD

Fundoplication
(standard)

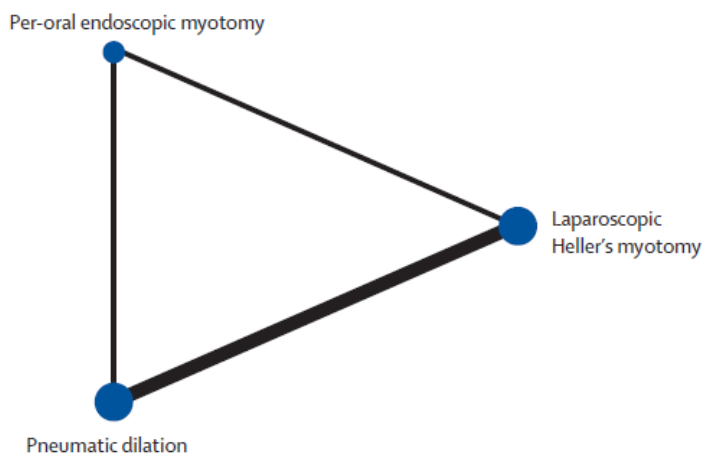
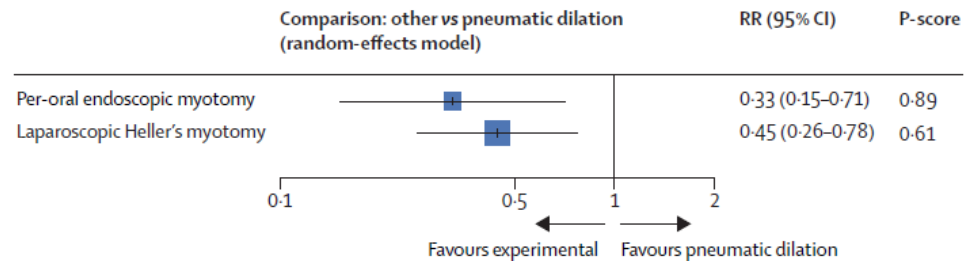
Shorter

Procedure time

Longer

A Intention-to-treat analysis

Per-oral endoscopic myotomy	0.96 (0.35-2.63)	0.25 (0.09-0.70)
0.73 (0.34-1.59)	Laparoscopic Heller's myotomy	0.49 (0.27-0.89)
0.33 (0.15-0.71)	0.45 (0.26-0.78)	Pneumatic dilation



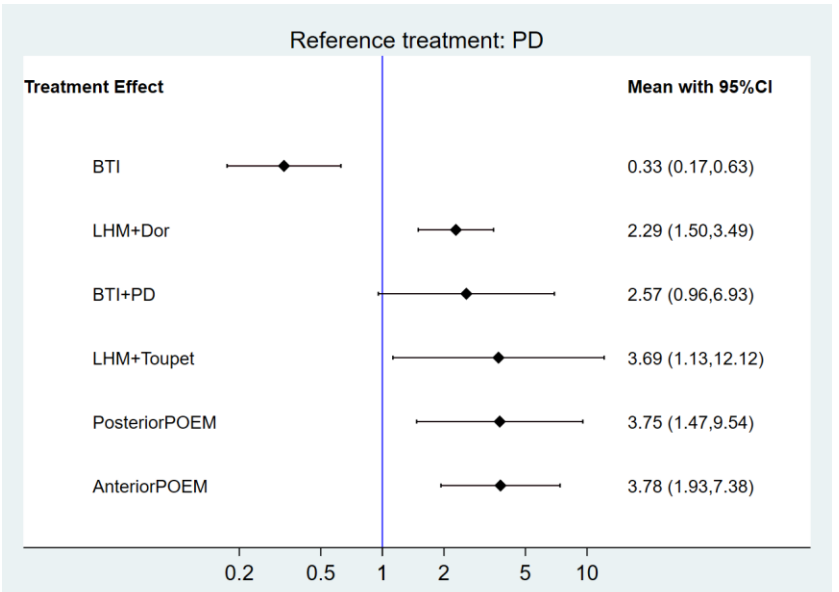
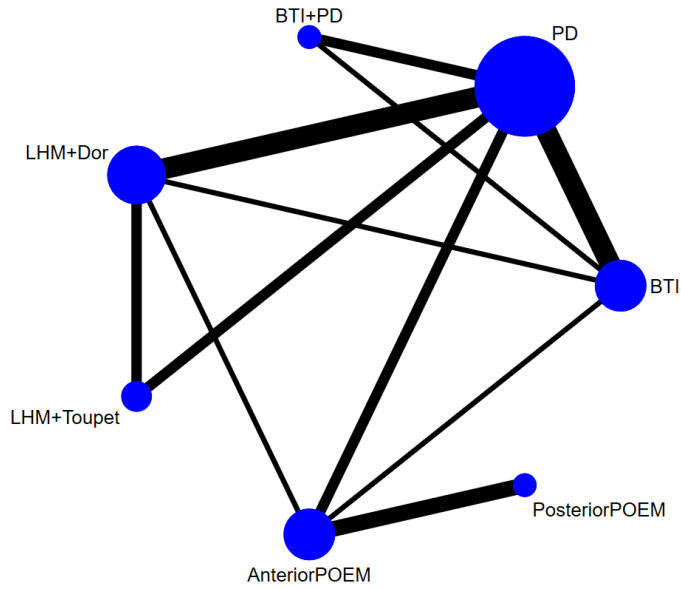
	Number of studies (number of patients)	Ranked first	RR (95% CI) vs last-ranked therapy*	Ranked second	RR (95% CI) vs last-ranked therapy*
Perforation ^{14-16,30,32-35}	8 (856)	Per-oral endoscopic myotomy	0.30 (0.05-1.91)	Pneumatic dilation	0.75 (0.38-1.48)
Surgery ^{15,30,33-35}	5 (652)	Per-oral endoscopic myotomy	0.11 (0.01-2.04)	Laparoscopic Heller's myotomy	0.34 (0.05-2.19)
Adverse events ^{15,16,31,32,34,35}	6 (519)	Pneumatic dilation	0.38 (0.24-0.58)	Laparoscopic Heller's myotomy	0.66 (0.37-1.17)
Serious adverse events ^{15,34,35}	3 (399)	Per-oral endoscopic myotomy	0.21 (0.01-4.21)	Laparoscopic Heller's myotomy	0.57 (0.02-15.10)
Need for re-intervention ^{15,16,33-35}	5 (663)	Per-oral endoscopic myotomy	0.24 (0.04-1.31)	Laparoscopic Heller's myotomy	0.44 (0.11-1.75)
Gastro-oesophageal reflux ^{†14-16,34,35}	5 (400)	Laparoscopic Heller's myotomy	0.62 (0.24-1.64)	Per-oral endoscopic myotomy	0.74 (0.27-2.03)
Erosive oesophagitis ^{‡32,34,35}	3 (283)	Pneumatic dilation	0.17 (0.02-1.41)	Laparoscopic Heller's myotomy	0.40 (0.11-1.47)

POEM versus LHM

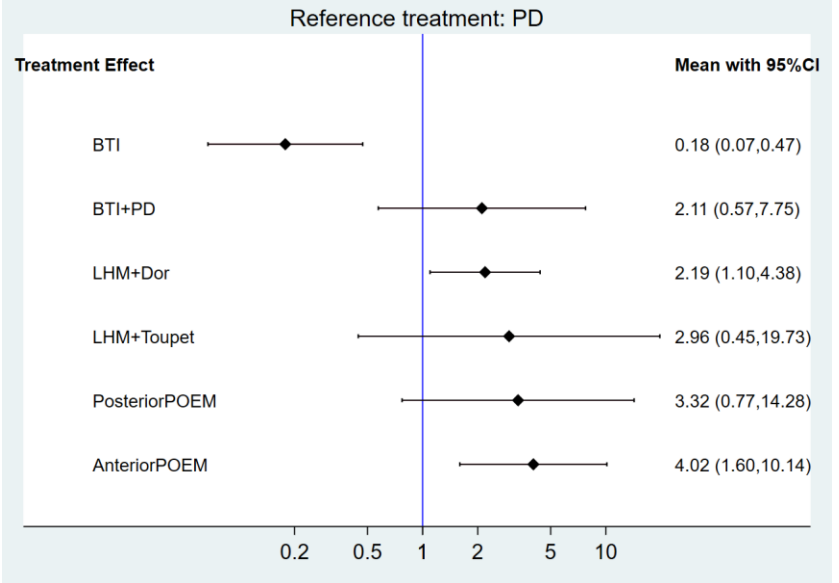
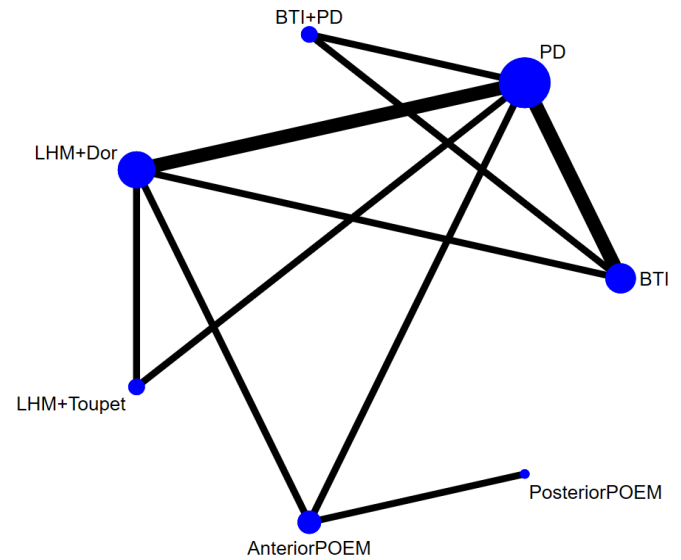
¹Lancet Gastroenterol Hepatol. 2021;6:30-38.

Department of Gastroenterology, Taichung Veterans General Hospital, Taiwan

≤ 1 year follow-up period

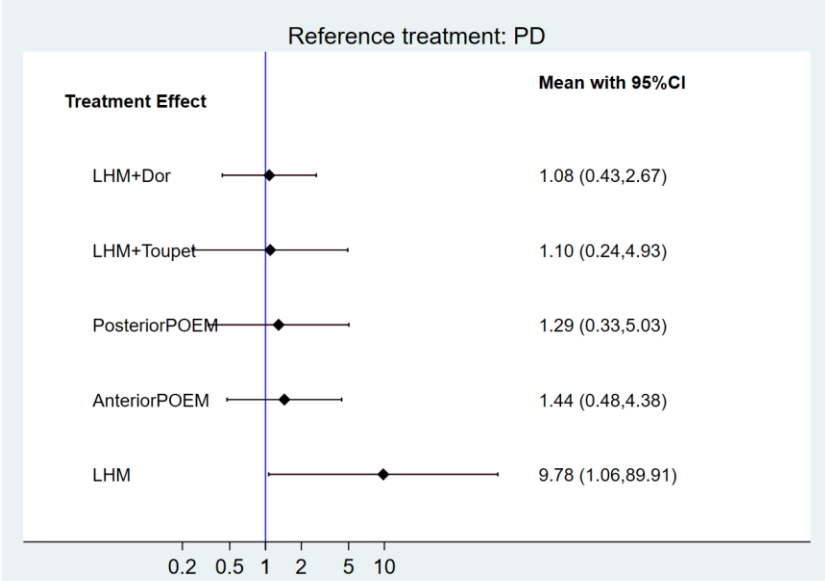
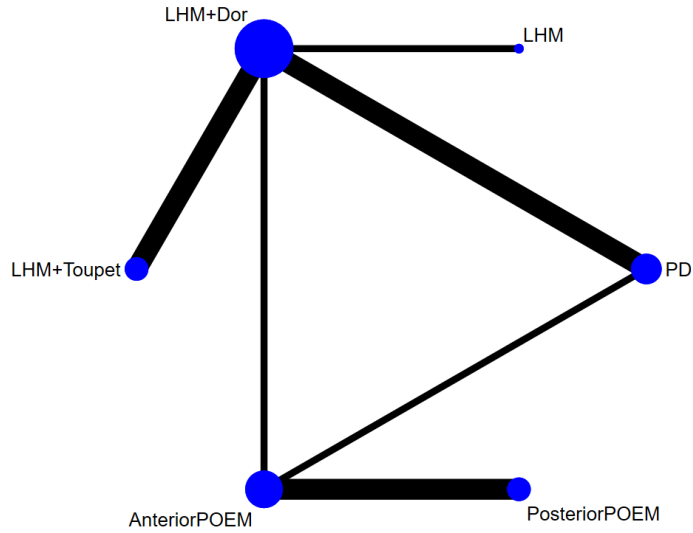


2 years follow-up period

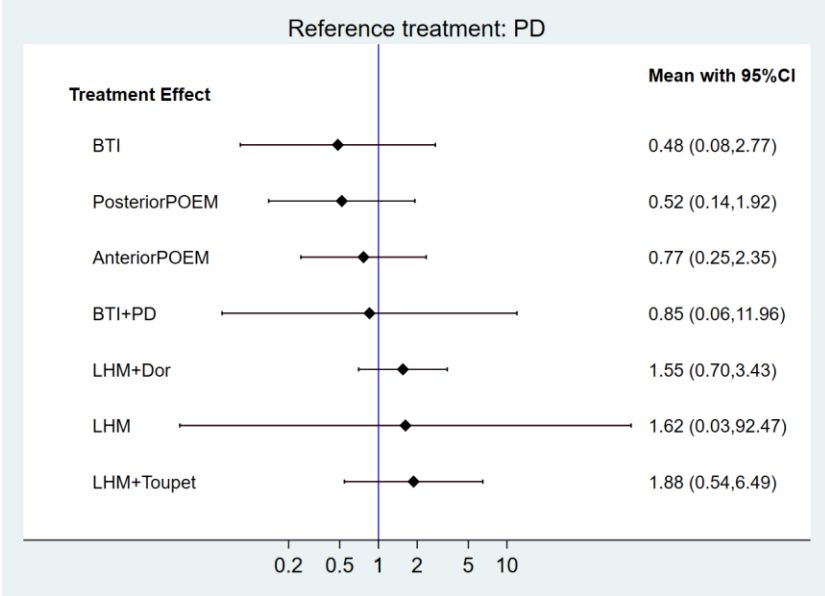
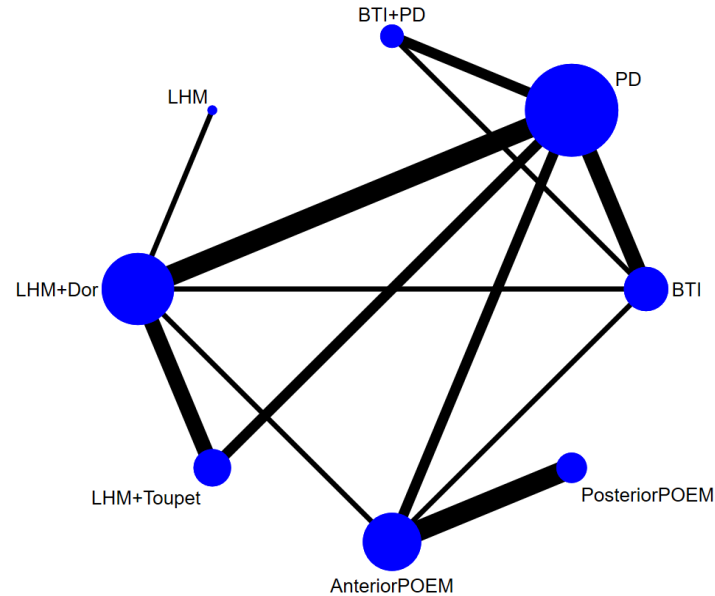


Department of Gastroenterology, Taichung Veterans General Hospital, Taiwan

Abnormal GERD



Moderate-to-severe AEs



We conducted a comprehensive comparison of 8 achalasia treatment according to different modalities and the results suggest **POEM with anterior or posterior approach might be recommended at first**, and **LHM with Dor or Toupet fundoplication as alternative treatment choices**. PD or BTI + PD could be considered in poor candidate for surgery due to limited efficacy. In contrary, **LHM without fundoplication and BTI are not recommended** as definitive therapy for patients with idiopathic achalasia.

Short Summary

The recent advances and innovations in **third and fourth space endoscopic procedures** have permitted endoscopic access to places, previously thought impossible, with reduced peri-operative morbidity due to its minimally invasive nature.

While **short- and mid-term outcome** have shown compatible results between **POEM and LHM**, we eagerly await the outcome studies of **Z-POEM, D-POEM, G-POEM, ESSD, STER**, and even **EFTR** before these procedures could be established as the **priority of choice**.

Take Home Message