CS combine meeting

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June 27, 2025

38 y/o female, with SLE and PH diagnosed

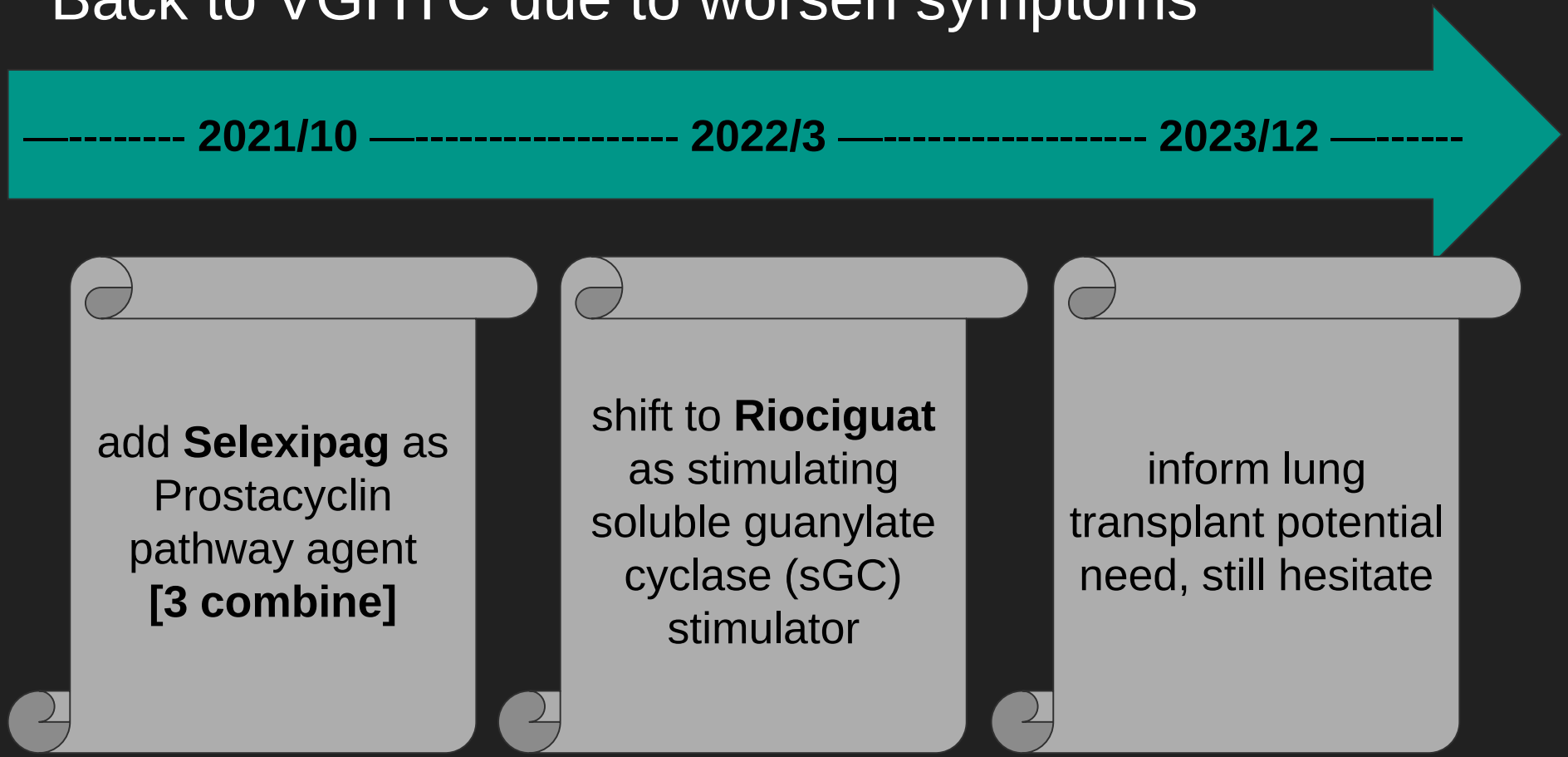
—-------- 2007 —---------- 2016/10 —---------- 2017/3 —--------

add **Sildenafil** as phosphodiesterase -5 inhibitors (PDE5i)

add **Bosentan** as endothelin receptor antagonists (ERAs) **[2 combine]**

Bosentan or **Macitentan** as ERAs, shift to LMD follow

Back to VGHTC due to worsen symptoms



Functional class III–IV despite optimal treatment

—-------- 2024/12 —---------- 2025/3/9 —---------- 2025/3/25 ------

add **Treprostinil** as Prostacyclin pathway agent **[4 combine]**

admission for lung transplant (LTx) survey (PFT, HRCT, EGD)

GI: HRIM + HMII-pH testing

LTx survey (2025/3/9)

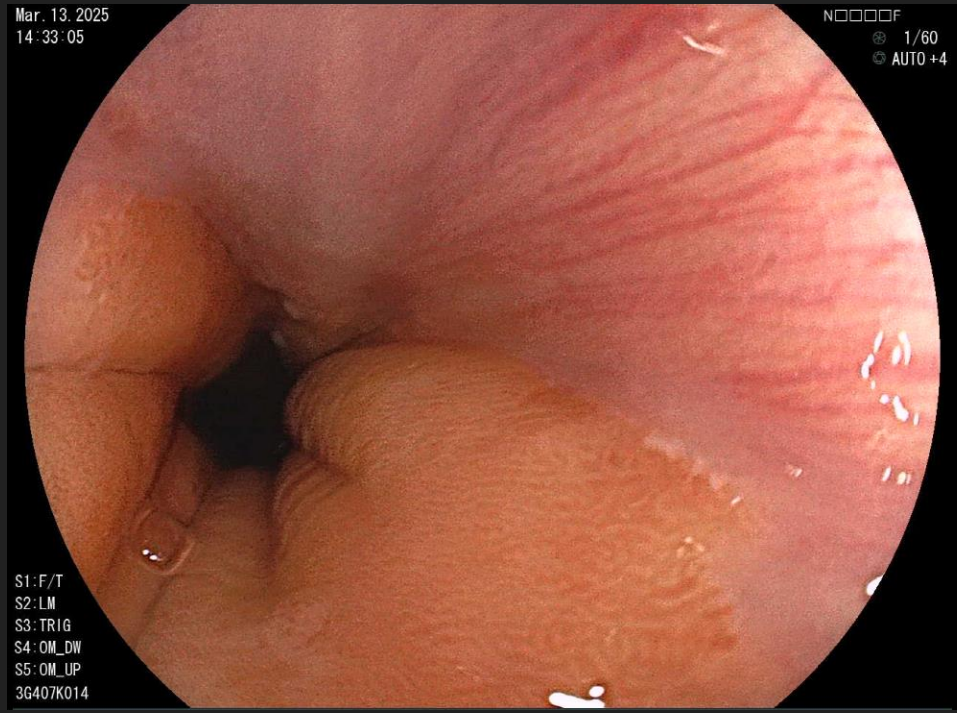
F-V LOOP		PRE-RX		
SPIROMETRY (BTPS)		PRED	ACTUAL	%PRED
FVC	LITERS	2.84	1.25	43
FEV1	LITERS	2.45	0.77	31
FEV1/FVC	%	84.0	62	73
FEF25-75%	L/SEC	2.92	0.36	12
FEF25%	L/SEC	5.04	1.31	26
FEF50%	L/SEC	3.47	0.49	14
FEF75%	L/SEC	1.47	0.12	8
FEF200-1200	L/SEC			
PEF	L/SEC	5.68	2.76	48

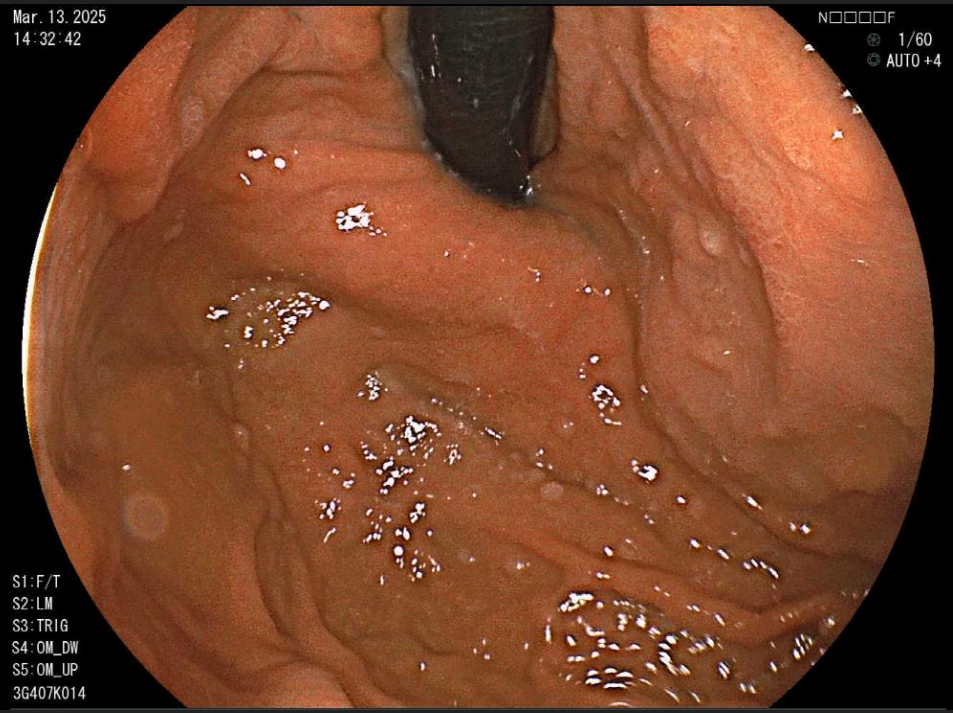
DIFFUSION		PRE-RX		
		PRED	ACTUAL	%PRED
DLCO	ML/MIN/MMHG	17.46	12.66	72
DLCO/VA	1/MIN/MMHG	4.80	4.07	84
VA	LITERS	3.64	3.11	85

EGD (2025/3/13)

LA Grade A / Hill’s Grade II / AFS Grade 2

Nguyen, et al. Foregut. 2022.

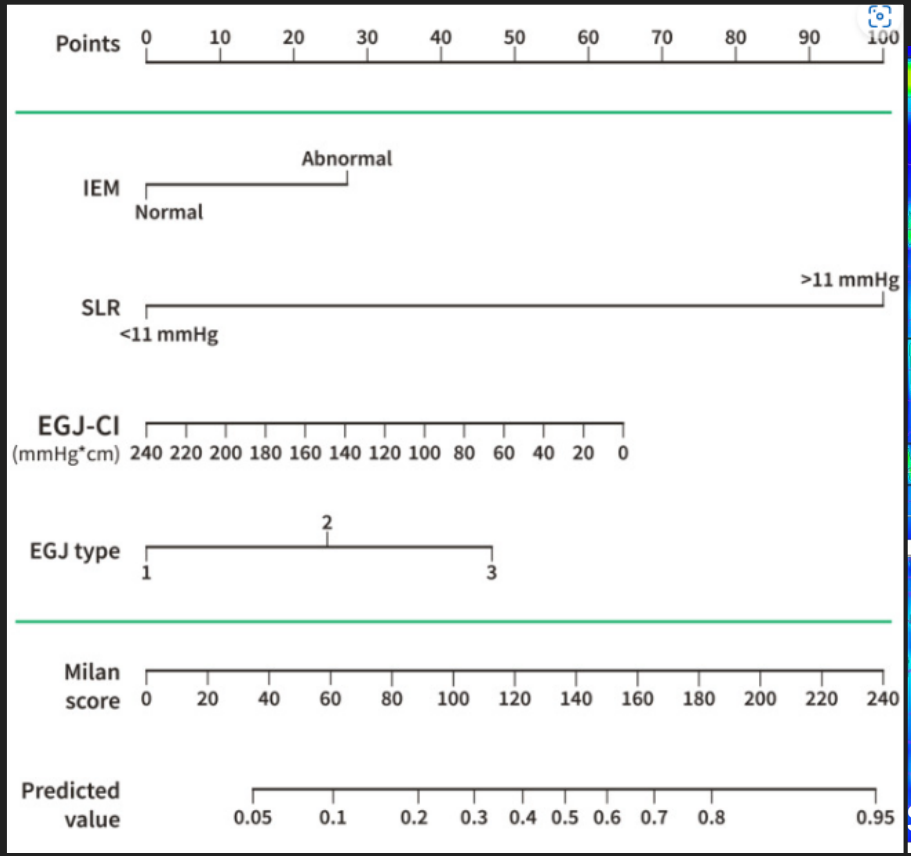


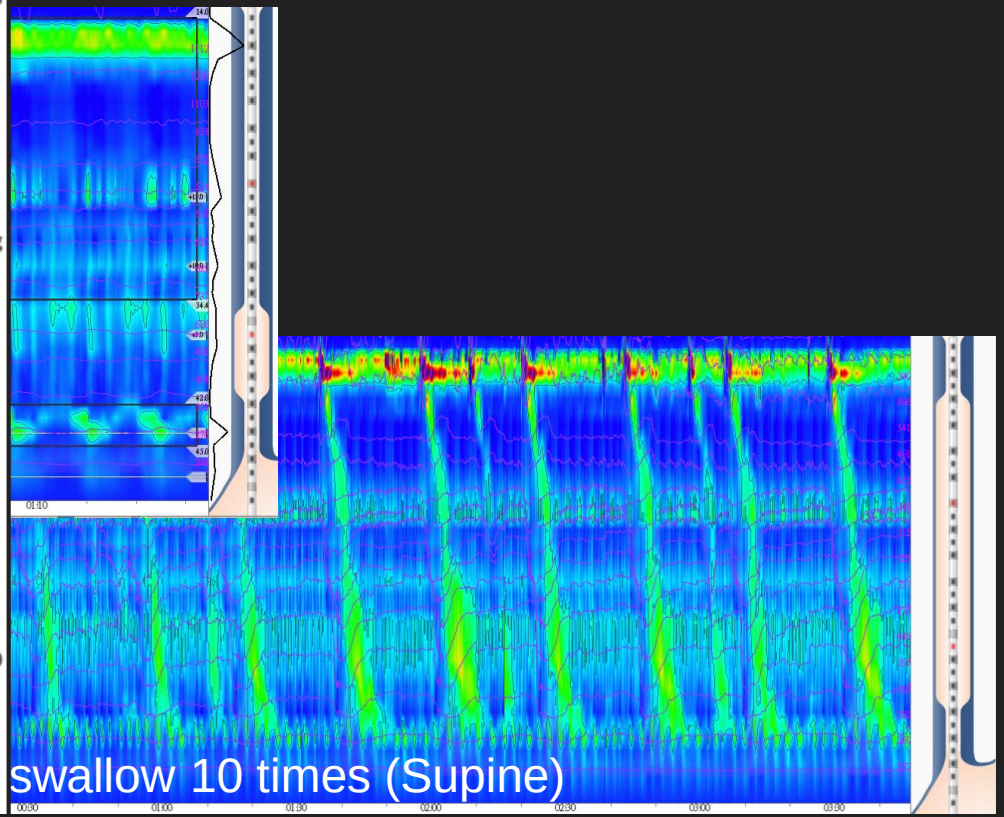


HRIM (2025/3/25)

Milan score (if SLR negative) = 15.7% (very unlikely)

Siboni S, et al. United European Gastroenterol J. 2024.



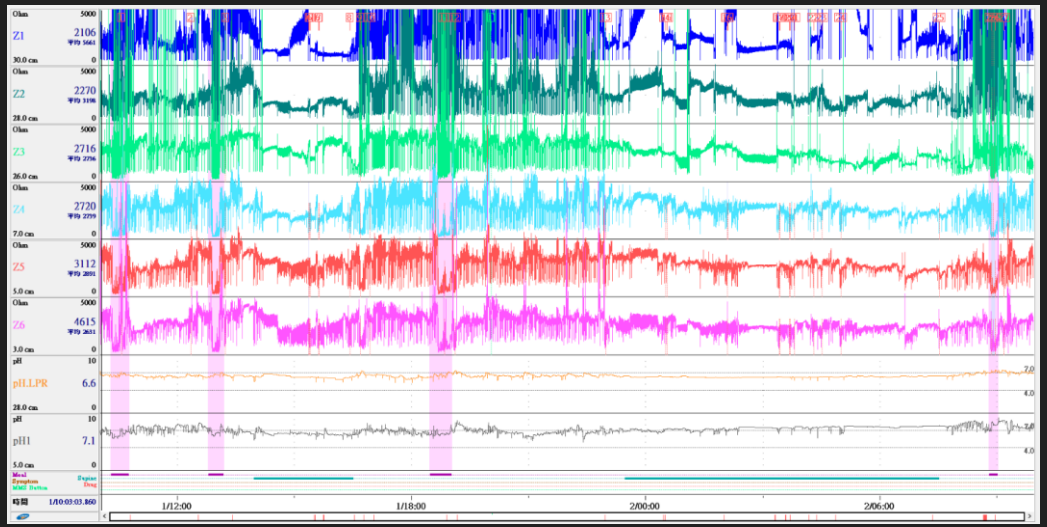


HMII-pH (2025/3/25)

- No GERD (nor PAR)
- Unspecified etiology of mild decreased MNBI

Gyawali CP, et al. Gut. 2024.

MNBI = 5489 (Z1), 2225 (Z2), 2163 (Z3), 2605 (Z4), 2734 (Z5), 2393 (Z6)



pH sensor:
■2 pH located at
  ■hypopharynx and distal esophagus: (1) cm above UES, (6) cm above LES

During the test, the patient was
■Off PPI

[RESULTS]
■Acid-distal esophagus
  ■Acid %time distal
  [Total] 0.0% (<4.2%) [Upright] 0.0% (<6.3%) [Supine] 0.0% (<1.2%)
  ■No. of reflux distal
  [Total] 24 (<80) [Upright] 8 [Supine] 16
  ■Reflux clearance time (sec)
  ■Symptom index
  [Total] N/A (<50%)
  ■Symptom association probability
  [Total] N/A (<95%)
  ■DeMeester score
  [Total] 0.2 (<14.7)

■Acid-pharynx
  ■Acid %time pharynx
  [Total] 0.0% (<1.3%) [Upright] 0.0% (<1.3%) [Supine] 0.0% (<0.0%)
  ■No. of pharyngeal acid reflux (PAR)
  [Total] 0 (<1) [Upright] 0 (<1) [Supine] 0 (<1)

[SYMPTOM-REFLUX ASSOCIATION]
■No report symptom

Questions to ask

1. Reflux disease vs. Lung transplantation?

Why so serious?

GERD is a real issue in lung transplantation

- Lung transplantation carries high risk
  - 5-year survival rate around 50%

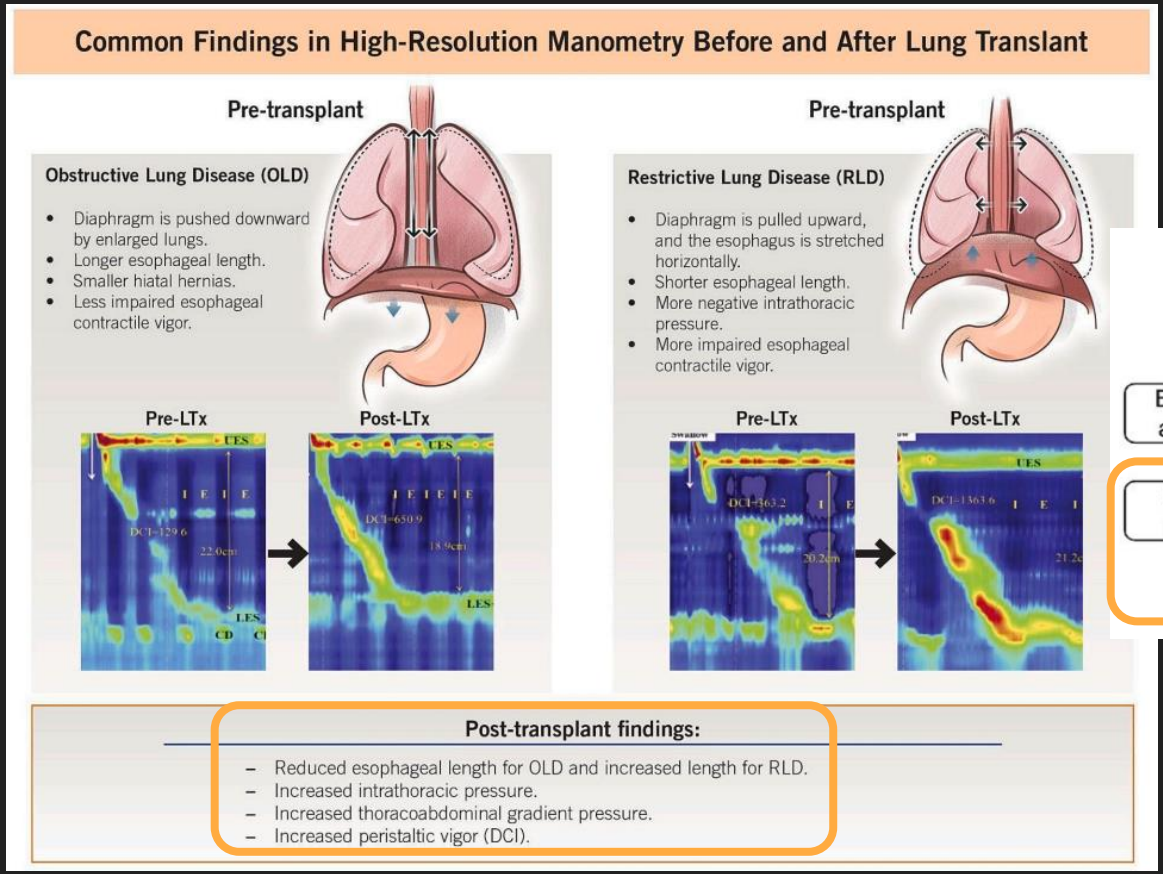
Christie JD, et al. J Heart Lung Transplant. 2012.

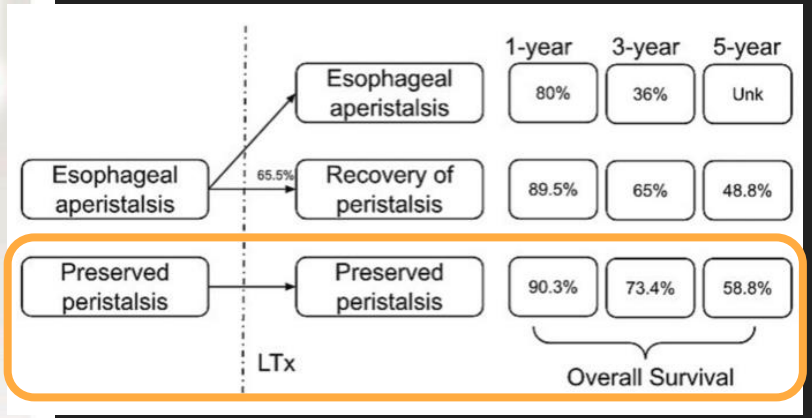
Big difference on outcome & ARS decision making

- Evidence supporting impedance-pH testing
  - Prolonged bolus clearance, more distal & proximal reflux episodes were significantly associated to earlier allograft injury after lung transplantation.
  - Non-acid reflux alongside acid reflux increases the risk of chronic rejection
  - Pre-transplant ineffective esophageal motility (IEM) is linked to post-transplant acute rejection (independent of reflux)

Lo WK, et al. J Heart Lung Transplant. 2015.
Lo WK, et al. Dis Esophagus. 2024.
Lo WK, et al. World J Gastroenterol. 2023.

More than acid: motility change after lung transplant





Latorre-Rodríguez AR, et al. Transplant Rev (Orlando). 2024.

Potential roles of biochemical study

- Bronchoalveolar lavage fluid
  - Pepsin (1 ng/L-1): indicates that aspiration is common in LTx patients
    - Pepsin is detected in 44–100% of lungs in reflux patients, but its sensitivity compared to pH impedance is limited (45–71%).
    - Treatment: Alginates?

Reder NP, et al. Surg Endosc. 2014.
Rosen R, et al. Neurogastroenterol Motil. 2012.
Samuels TL, et al. Laryngoscope. 2022.

Summary & Back to our patients

Q&A

- No strong indication for pre-LTx PPI / ARS
  - No reflux evidence (by impedance-pH test)
  - Not high risk candidate of post-transplant reflux (no IEM)

討論

- 病人術前HRIM及HMII-pH檢查結果顯示**無明顯GERD或咽喉逆流證據**，故醫師評估目前**無強烈術前抗逆流手術(ARS)或長期PPI使用的適應症**。
- 若檢查結果沒有逆流，但病患仍有症狀，則可能屬於「功能性食道過度敏感(hypersensitivity)」或「過度警覺 (hypervigilance)」，這類病患的症狀可能與焦慮或憂鬱有關。可考慮使用低劑量神經調節劑來處理這類症狀。
- **檢測過程的考量與功能性症狀**。肺部移植候選者常需要氧氣輔助，但檢測過程（如食道蠕動功能檢查）通常不會移除氧氣，只要病患能配合，約 20-30 分鐘即可完成。
- 考量肺臟移植術後迷走神經受損致食道蠕動功能惡化，建議**術後三個月內應再進行食道蠕動與胃酸測試**，以決定PPI或ARS。GERD在肺臟移植患者中普遍且常無症狀，與術後「細支氣管炎閉塞症候群(BOS)」及移植體衰竭高度相關；早期ARS或持續PPI可降低移植體損傷。
- 未來可考慮檢測支氣管肺泡灌洗液中**胃蛋白酶和膽酸**，提供客觀證據，膽酸為更特異BOS標誌物。若檢查陰性但症狀續存，恐為功能性食道過敏。
- 會議強調**個人化治療方針**，病患SLE病史亦使術後免疫抑制管理更具挑戰。