



XXIX IFSO World Congress

1-4 September 2026 | Toronto, Canada

Prediction of De Novo and
Worsening GERD
After Sleeve Gastrectomy Using
FLIP

Reem Matar, MBBS, MPH; Joseph Klim,
MD; Karthik Ravi, MD; Nour El Ghazal, MBBS;
Andre Teixeira MD; Barham Abu Dayyeh, MD,
MPH; Omar Ghanem, MD

TORONTO 2026

The Future of Obesity Management:
From Weight Loss to Health Gain



ifso2026.org

Disclosures

- No relevant financial relationships to disclose.



Why This Matters

Postoperative GERD is a major complication of sleeve gastrectomy.

- Current preoperative risk stratification is driven largely by symptoms and anatomy
- Functional lumen imaging probe (FLIP) adds physiologic information: EGJ opening and esophageal contractile response

STUDY QUESTION

Can preoperative FLIP identify patients at risk for de novo or worsening GERD after sleeve gastrectomy?



Prospective Multicenter Pilot Study

1 COHORT

Adults undergoing
primary sleeve
gastrectomy
2 tertiary centers

2 PRE-OP

EGD + FLIP
40–60 mL stepwise
distension

3 PHYSIOLOGY

EGJ-DI, CSA,
contractile
response

4 SYMPTOMS

GERD-HRQL

Primary outcome

De novo or worsening symptomatic GERD at 6 months

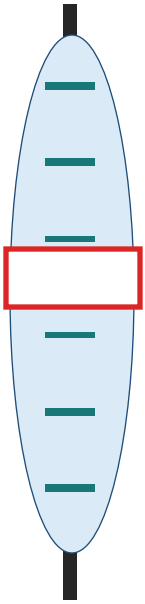
Defined as >50% or ≥ 6 points increase from GERD-HRQL total baseline score

Exploratory: 12-month outcomes | Nonparametric testing + logistic regression



How FLIP Measures EGJ Physiology

Volume-controlled balloon distension



Conductive fluid fills balloon

Impedance electrodes → diameter / CSA along the lumen

Pressure sensor → intraballoon pressure

EGJ appears as the narrow “waist”

Our protocol: 40 → 50 → 60 mL

Measurements were obtained during stepwise preoperative distension.

Parameters used in this study

CSA

Cross-sectional area (mm²)

Luminal opening at the EGJ

Pressure

Intraballoon pressure (mmHg)

Distending pressure during balloon fill

EGJ-DI

CSA ÷ pressure (mm²/mmHg)

How easily the EGJ opens under pressure

Contractile response

Distension-induced esophageal contractions

Antegrade / diminished response patterns

Key idea: FLIP adds physiology—not just anatomy or symptoms.

DI in this study was assessed at the 60-mL fill volume.



Cohort Snapshot

N = 32

completed 6-
month follow-up

43.5 years

median age

87.5%

female

43.4 kg/m²

median BMI
at SG

- 43.8% had GERD symptoms preoperatively
- 25.0% were using a proton pump inhibitor at baseline

This was a small, predominantly female pilot cohort.



Primary Outcome at 6 Months

45.2%
worsened GERD-
HRQL

PPI use increased



NOT PREDICTIVE

Baseline EGJ-DI and cross-sectional area were not significantly associated with GERD worsening.

SIGNAL DETECTED

Baseline esophageal contractile response differed between outcome groups ($p = 0.043$).

Median GERD-HRQL for the cohort overall was unchanged — masking substantial patient-level worsening.



The Physiologic Signal Was Contractile Response

NO GERD WORSENING

Diminished distension-induced contractile response occurred only in patients without worsening symptoms.

GERD WORSENING

A normal contractile response predominated among patients with worsening symptoms.

Contractile response appeared more informative than EGJ distensibility alone.

Association signal: $p = 0.043$



12-Month Follow-up

n = 16
available at 12 months

37.5%

persistent or
worsening GERD

HILL GRADE

Higher baseline grade
associated with worsening
($p = 0.021$)

- EGJ-DI and CSA remained nonsignificant.



Take-Home Message

Nearly half had worsening GERD symptoms by 6 months after sleeve gastrectomy.

- EGJ distensibility alone did not predict postoperative symptoms.
- Preoperative esophageal contractile response was the most informative physiologic parameter.
- GERD after sleeve appears dynamic; larger longitudinal studies are needed before clinical implementation.

CLINICAL IMPLICATION

FLIP may eventually complement anatomic and symptom-based risk assessment.



Thank You

Questions?

Reem Matar, MBBS, MPH

Mayo Clinic

Prediction of De Novo and Worsening GERD After Sleeve Gastrectomy Using
EndoFLIP

