Managing Upper GI Symptoms

After Fundoplication

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Objectives

1

Recognize common post-fundoplication symptom phenotypes

2

Apply a test-driven evaluation algorithm

3

Select appropriate medical, endoscopic, and surgical management

Introduction

✓ Fundoplication remains the gold standard antireflux procedure, with >80% of patients achieving long-term freedom from PPIs

! However, post-fundoplication symptoms are common, with structural complications occurring in up to 30% of cases

∞ Recurrence rates vary widely: 10–27% in specialized centers, up to 43% in real-world settings

Katz et al 2021, Yadlapati et al 2018

Why This Matters

Most early symptoms improve; persistence >3 months deserves anatomy-first evaluation

0–3 months	3–6 months	>3 months persistence	~1 year
↑	↘	!	✓
Edema + adaptation	Most symptoms improve	Objective testing warranted	Outcomes generally favorable

Symptom Recurrence ≠ Failed Surgery

Fundoplication changes anatomy/physiology

≠

Symptoms may reflect mechanical issues, motility disorders, or functional GI conditions

Start with Phenotype + Red Flags

🚨 Red Flags → Expedite Evaluation

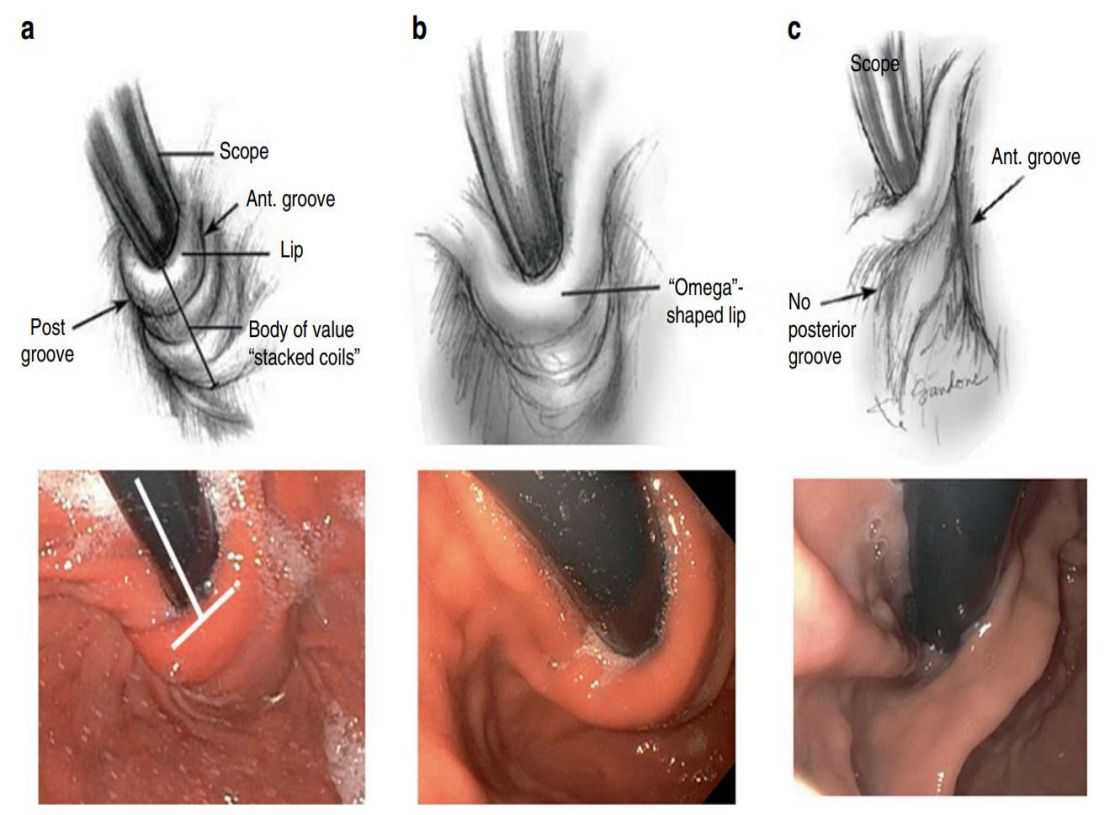
- Progressive dysphagia
- Unintended weight loss
- GI bleeding
- Persistent vomiting

EGD first in most dysphagia/alarm symptom contexts

Symptom Phenotype Drives Work-up

- Dysphagia → Anatomy + physiology (HRM)
- Reflux sx → pH monitoring ± endoscopy
- Gas-bloat → Dietary/behavioral first
- Functional overlap → Consider DGBI, rumination, aerophagia

Anatomy — Know What Was Done



Key Surgical Details

- **Wrap type**
- **Hiatal hernia repair ± mesh**
- **Collis Gastroplasty**
- **Operative report**
- **Presurgical HRM ± pH**

Dysphagia / Obstructive Symptoms — Assessment

Early (weeks–few months)

- Edema, transient dysmotility
- Supportive care if mild
- Reassure patient; re-evaluate if persists >3 months
- 54.8% of patients, clinically significant in 20.4%

Persistent (>3 months) or Severe

- Evaluate mechanically and physiologically
- Late dysphagia: 18.5%, median onset 9 months post-surgery

Early dysphagia: 54.8% of patients, clinically significant in 20.4% | Late dysphagia: 18.5%, median onset 9 months post-surgery | Hasak et al. CGH 2019

Baseline Investigations for Symptomatic Patients

Structure first, then physiology

EGD Esophagogastroduodenoscopy

- Mucosa
- Wrap appearance
- Biopsy if indicated

BE Barium Esophagram

- Herniation
- Slippage
- With tablet

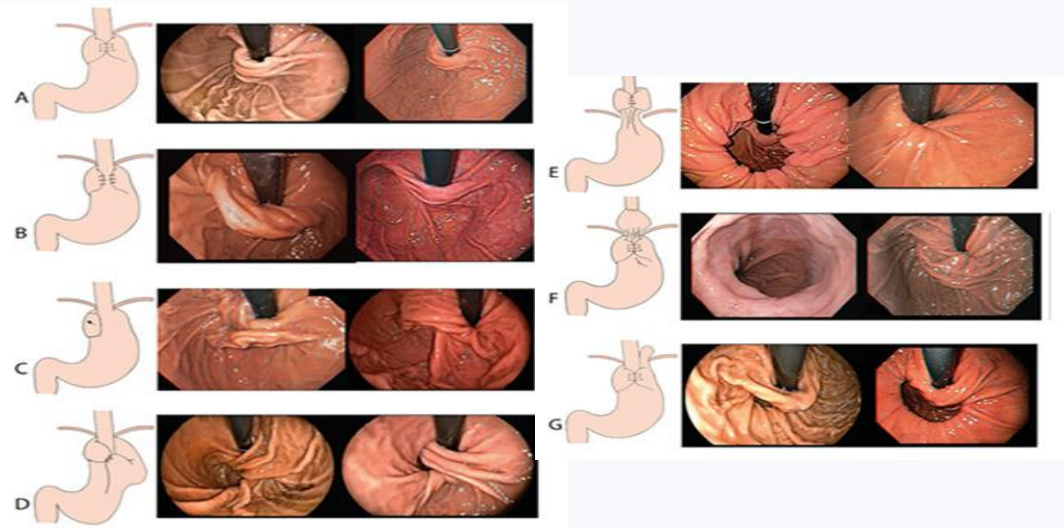
HRM High-Resolution Manometry

- Required before revision
- Apply Padova classification

pH Ambulatory Reflux Monitoring

- Off PPI if GERD uncertain
- On PPI in proven GERD with refractory symptoms

Types of Anatomic Failure



⚠ Symptom severity does not reliably predict mechanism → objective testing essential

Martins et al. Arq Bras Cir Dig 2021

Common Failure Patterns

Herniated wrap
Most common (30–80%)

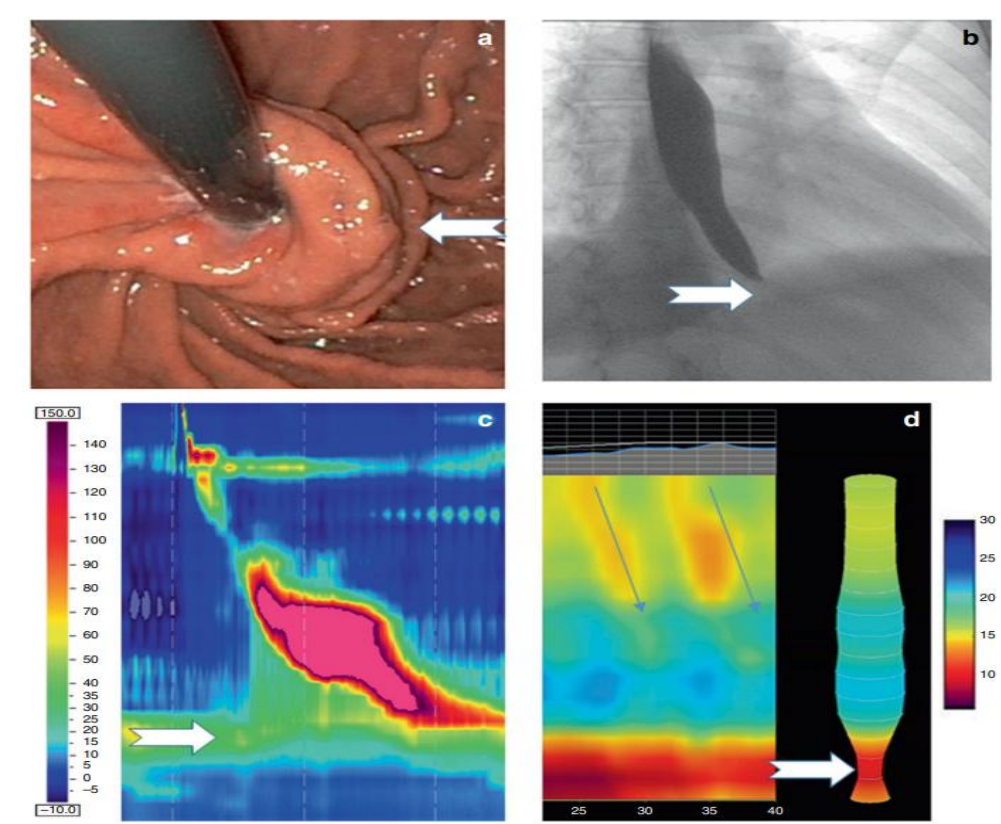
Slipped fundoplication
15–30% of failures

Disrupted fundoplication
Partial or complete wrap disruption

Twisted wrap
Rotational malposition

Paraesophageal hernia
Can develop after repair

Where FLIP Can Fit



Functional Lumen Imaging Probe

- Consider in Obstructive Symptoms
- Helpful when HRM is equivocal
- Can be performed during endoscopy
- Assesses EGJ opening dimensions + motor function (diameter changes vs. pressure)
- Note: normative post-surgery distensibility values not yet established

Padova Classification: Post-Fundoplication HRM Interpretation

STEP 1: ANATOMY — LES-CD Separation?

- HPZ below CD (>1 cm)
  Slipped fundoplication
- HPZ above CD, low LES pressure
  Disrupted wrap + herniation
- HPZ above CD, normal LES pressure
  Intrathoracic fundoplication
- No separation
  → **Proceed to Step 2**

STEP 2: PHYSIOLOGY — Neo-LES Pressures

- Low LES basal pressure
  Disrupted / ineffective ARS → reflux monitoring
- High LES basal or elevated IRP
  PFOO (tight wrap / crural repair)
- 100% failed peristalsis
  Pre-existing vs. pseudo-achalasia
- Normal LES + IRP + some peristalsis
  Expected post-fundoplication findings

■ Abnormal/Concerning ■ Caution ■ Expected/Normal

Validating the Padova Classification: PFOO vs. Functioning Fundoplication

Forattini et al. | Neurogastroenterology & Motility 2025;37:e70196 | First multicenter study applying the Padova Classification (n=106 post-LNF patients, University of Padova + UCSD)

62

PFOO

Post-Fundoplication Outflow Obstruction

44

FELF

Functioning Effective Laparoscopic Fundoplication

How was PFOO diagnosed? (n=62)

77.4%	IRP alone (>19 mmHg)
11.3%	LES basal pressure alone (>48 mmHg)
11.3%	Both IRP + LES basal pressure

HRM Parameter	PFOO	FELF	p
LES basal pressure	**41.2 mmHg**	23.7 mmHg	**<0.01**
IRP	**19.3 mmHg**	10.3 mmHg	**<0.01**
LES total length	36.5 mm	31 mm	0.01
LES abdominal length	20.5 mm	14 mm	0.01
Elevated IBP	**34%**	11%	**<0.01**
Premature swallows	**12.3%**	3.9%	**<0.01**
DES (CC v4.0)	22.6%	6.8%	0.02

! **Dysphagia was present in 89% of PFOO patients vs. 5% of FELF patients (p<0.01) — IRP was the only independent predictor of dysphagia on multivariate analysis (OR 1.82, 95% CI 1.35–2.47)**

PFOO: Treatment Pathway & Outcomes (Forattini et al. 2025)

Overall Success **89%**

25/28 treated with PD ± redo surgery achieved symptom relief
(median follow-up 126 months)

Pneumatic Dilation alone **32%**

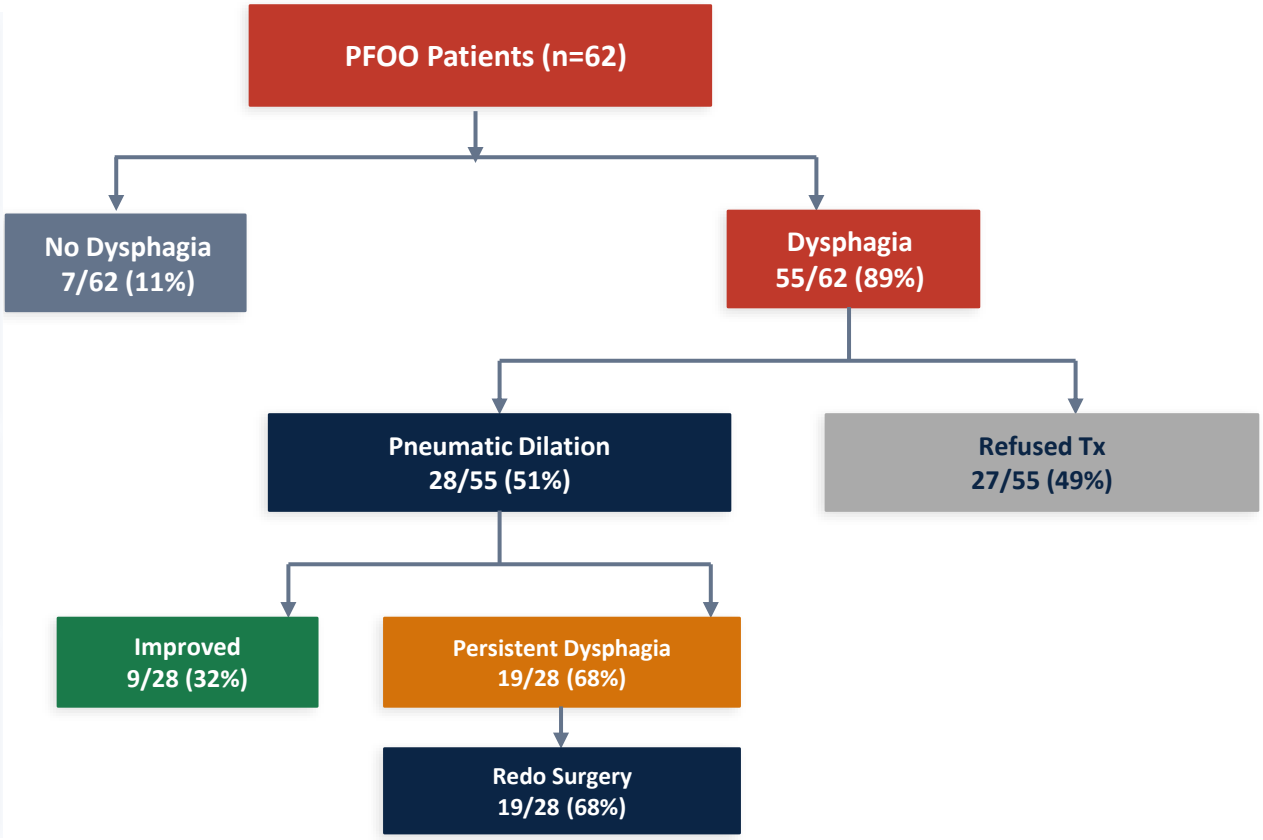
9/28 improved with PD; accepted by ~half of symptomatic patients

Redo Surgery (post-PD failure) **84%**

16/19 achieved relief; 89% underwent Toupet rather than repeat Nissen

Intraoperative cause of PFOO ✓

Tight wrap: 43% | Tight crura: 28.5% | Unclear: 37%
No HRM parameter predicted PD success



HRM using Padova criteria reliably identifies obstructive fundoplication & supports sequential management: pneumatic dilation first, redo surgery for refractory cases

Heartburn / Regurgitation after Fundoplication

17.7% experience reflux recurrence during 5-year follow-up

1 **Confirm reflux recurrence**	Reflux monitoring + endoscopy
2 **Objective reflux recurrence confirmed**	Optimize lifestyle + pharmacotherapy
3 **Refractory with proven reflux + anatomic failure**	Consider surgical revision
4 **Reflux testing negative**	Pivot to functional heartburn / reflux hypersensitivity pathway

Yadlapati et al. CGH 2022

Gas-Bloat Syndrome

Mechanism

- Impaired venting of gastric gas
- Aerophagia and supragastric belching patterns
- Nissen > Toupet for gas-bloat symptoms

Dietary & Behavioral

- Avoid carbonated beverages, gum, hard candy
- Avoid rapid eating; treat constipation
- Diaphragmatic breathing if supragastric belching suspected

Medical Management

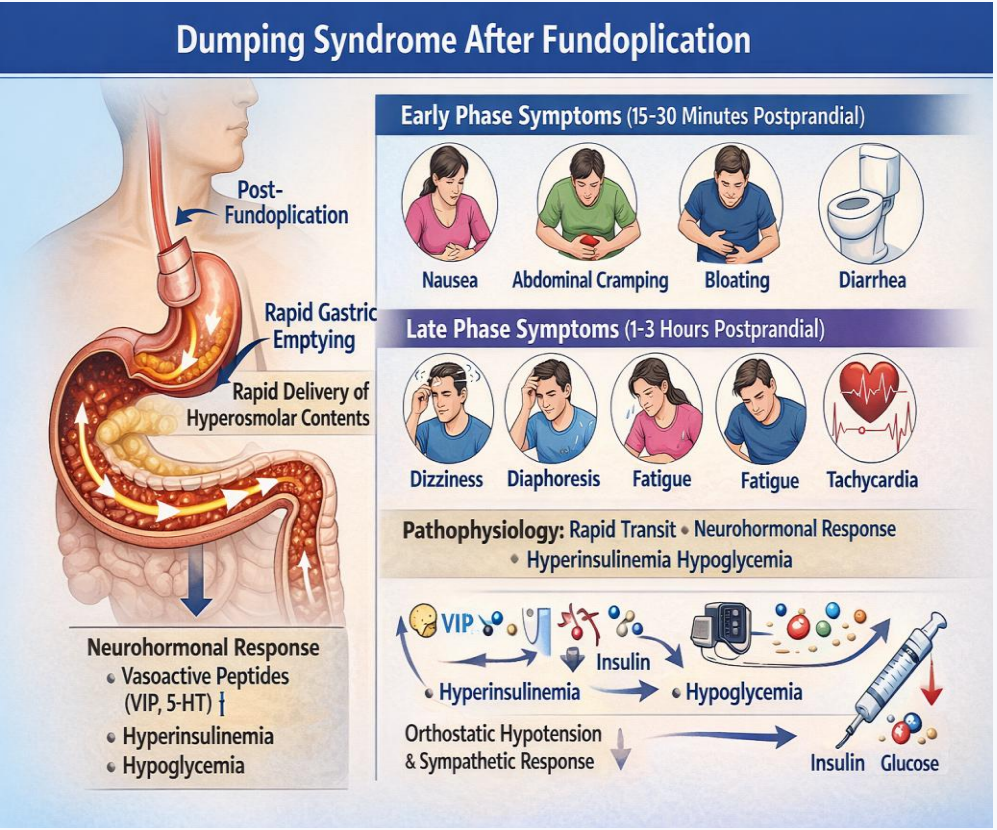
- Simethicone: low-risk first-line
- Rifaximin if SIBO confirmed (present in 50% of severe cases)
- Address DGBI overlap if present

Escalation

- Severe, persistent with QOL impact
- Surgical discussion if 'supracompetent barrier' with objective evidence
- Conversion to partial wrap in select cases

Richter, CGH 2013

Dumping Syndrome



Early Dumping (<1 hr)

- Rapid gastric emptying → fluid shifts + hormone release
- Vasomotor: flushing, tachycardia, diaphoresis
- GI: cramping, nausea, diarrhea

Late Dumping (1–3 hrs)

- Incretin-driven hyperinsulinemic response → hypoglycemia
- Weakness, dizziness, tremor, altered mentation
- High simple-carb diets are a key risk factor

Management

- Small frequent meals, avoid simple carbs/juices, separate liquids from solids
- Acarbose for late dumping; octreotide for severe/refractory

When to Refer for Revisional Surgery

Indications for Referral

- Clear anatomic failure + correlating symptoms
- Refractory obstruction/dysphagia with supportive objective data
- Proven recurrent reflux not controlled medically
- Patient preference after shared decision-making

Referral Packet Checklist

Operative report • EGD findings • Esophagram • HRM • Reflux monitoring (on/off PPI) • BMI/comorbidities

Special Considerations

Increased M&M vs. primary surgery

Patients must understand higher risk profile of redo procedures; shared decision-making is essential

Obesity (BMI >35)

Guideline discussions favor RYGB vs. redo fundoplication; bypass effectively controls reflux and addresses weight

MSA (Magnetic Sphincter Augmentation)

May be a safer option in select patients unable to tolerate redo fundoplication

RYGB as salvage

Effective option in select refractory cases, especially with obesity

Key Takeaways

1. Symptoms ≠ failure
2. Anatomy first, then physiology
3. Use Padova to Interpret Post-Op HRM
4. Most patients managed non-operatively
5. Confirm Reflux Before Escalating Therapy