

# Role of Esophageal Ph-Impedance and Manometric Monitoring in the Therapeutic Strategy for Refractory Gerd

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**Abstract** Refractory gastroesophageal reflux disease (GERD) remains a significant clinical concern, affecting nearly one-third of patients despite standard proton pump inhibitor (PPI) therapy. This paper explores the diagnostic and therapeutic implications of esophageal pH-impedance and manometric monitoring in managing these challenging cases. By characterizing reflux episodes beyond acid exposure and evaluating esophageal motor function, clinicians can identify phenotypes such as weakly acidic reflux, esophageal hypersensitivity, and ineffective esophageal motility. Our findings reinforce the integration of functional testing into routine GERD management to ensure precision-guided therapy.

**Keywords** Refractory GERD, pH-impedance, High-resolution manometry, Esophageal motility, Non-acid reflux, Personalized treatment

## 1. Introduction

GERD is a prevalent disorder that compromises quality of life and predisposes patients to complications such as Barrett's esophagus [1,2]. While PPIs offer symptomatic relief for most, up to 30% of patients continue to suffer from heartburn, regurgitation, or chest pain. Refractory GERD, defined as the persistence of symptoms despite adequate PPI therapy, necessitates deeper diagnostic evaluation. Traditional endoscopy and pH-metry fail to fully capture non-acidic reflux and motor dysfunctions, prompting reliance on advanced diagnostics: esophageal pH-impedance monitoring and high-resolution manometry (HRM) [3,4].

These tools not only quantify acid exposure but also detect the frequency, composition, and clearance of reflux episodes, as well as motility disturbances. This article investigates their role in stratifying patients and tailoring treatment strategies [5].

## 2. Materials and Methods

A cohort of 72 adult patients (aged 20–65) with persistent GERD symptoms despite double-dose PPI therapy were enrolled from tertiary gastroenterology clinics. Each patient underwent:

- 24-hour multichannel intraluminal impedance and pH monitoring (MII-pH) off therapy

- High-resolution esophageal manometry per Chicago Classification v4.0
- Symptom association probability (SAP) and symptom index (SI) assessment
- Clinical interviews and validated symptom scoring

Outcomes evaluated included reflux type, total number of reflux episodes, esophageal motility profiles, and correlation with symptom severity.

## 3. Results

Out of 72 patients, 52.8% had abnormal pH-impedance parameters, including:

- Weakly acidic reflux in 44.4% of cases
- Non-acidic reflux with positive symptom association in 27.8%
- Ineffective esophageal motility in 38.9% on HRM
- Low mean nocturnal baseline impedance (MNBI) in 61.1%, indicating impaired mucosal integrity
- LES hypotonia in 19.4%

**Table 1.** Diagnostic Features in Refractory GERD Patients

Parameter	Abnormal (%)
Weakly Acidic Reflux	44.4%
Non-Acid Reflux (SI/SAP+)	27.8%
Ineffective Esophageal Motility	38.9%
Low MNBI	61.1%
LES Hypotonia	19.4%
Functional Heartburn	13.9%

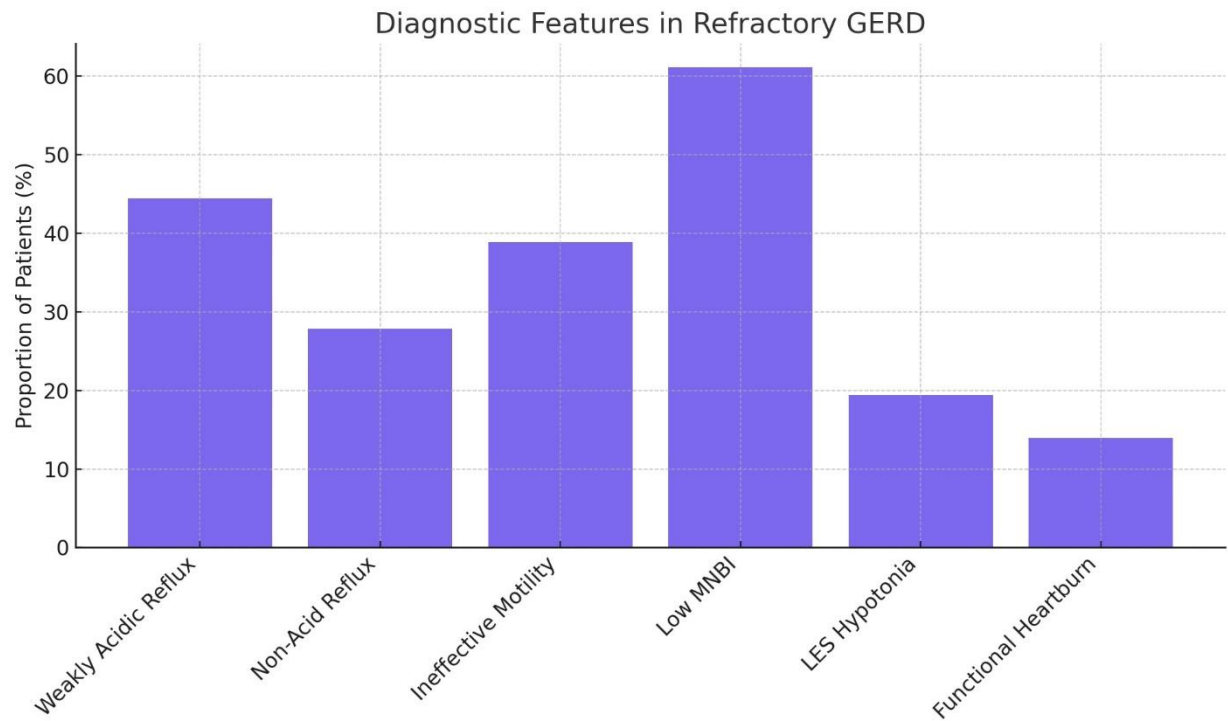


Figure 1

Functional heartburn (normal reflux profile, negative SI/SAP) was diagnosed in 13.9%, warranting neuromodulator therapy. Symptom patterns varied across reflux subtypes and manometric findings.

the therapeutic strategy for refractory GERD. Their application ensures appropriate targeting of therapy, reduces unnecessary medication use, and improves patient outcomes through individualized care.

4. Discussion

Our findings illustrate the heterogeneity of refractory GERD and the indispensable role of combined pH-impedance and manometric analysis. Weakly acidic and non-acid reflux often escape detection via standard pH monitoring but can cause significant symptoms. Manometric profiles further delineate subgroups suitable for prokinetics, behavioral therapy, or surgical intervention.

Patients with functional heartburn benefit more from neuromodulation than acid suppression. The integration of functional diagnostics not only refines differential diagnosis but enables evidence-based decisions in managing refractory GERD.

5. Conclusions

Esophageal pH-impedance and manometry are central to

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