

Obesity is rapidly increasing on a global scale, and bariatric surgery is recognized as the most effective long-term solution for significant weight loss. Despite the variety of surgical techniques available, their impact on esophageal function remains largely unclear, with existing studies showing inconsistent results regarding reflux control and the emergence of "de novo" reflux post-surgery.

The application of advanced diagnostic tools, such as high resolution impedance manometry (HRIM) and multichannel intraluminal impedance-pH monitoring (MII-pH 24-h), may provide deeper insights into the pathophysiology of gastroesophageal function after surgery in obese patients.

New surgical technologies, including robotic systems and 3D visualization, offer more precise dissection around the cardiac area, potentially affecting postoperative esophageal function and reflux.

Given that reflux and gastric pressure are interrelated, the primary goal was to evaluate the effects of prevalent bariatric techniques on esophagogastric junction (EGJ) function, esophageal peristalsis, and reflux exposure using HRIM and MII-pH as diagnostic standards. Additional aims included analyzing the relationship between postoperative reflux patterns and changes in intragastric pressure (IGP) and gastroesophageal pressure gradient (GEPG), as well as assessing gastric emptying in patients undergoing laparoscopic sleeve gastrectomy.

Abstract

Introduction Laparoscopic sleeve gastrectomy (LSG) is becoming increasingly popular because of its outstanding efficacy and minimal anatomical alterations. However, there are concerns about a heightened risk of postoperative gastroesophageal reflux disease (GERD). This study was done to assess the role of the new technologies -that is not in the routine practice- multichannel intraluminal impedance pHmetry (MII pH) and high-resolution impedance manometry (HRIM) in the diagnostic pathway of patients undergoing revisional surgery for GERD after LSG.

Methods This is an observational cross-sectional, monocentric study that was carried out on two groups of patients who had undergone LSG for over 6 months. The patients were categorized into two groups: one with GERD and the other asymptomatic according to their postoperative course; appearance of de novo GERD symptoms impairing quality of life (QOL) and needing revisional bariatric surgery. Gastroesophageal functions were evaluated using a clinical validated questionnaire, upper endoscopy, barium study, MII pH, and HRIM.

Results From 1st of November 2022 till the 30th of April 2024, all patients who were admitted to the bariatric surgery clinic, Molinette Hospital in Turin and were eligible for the study were included. Ten patients entered the study (GERD group) and were compared to a control group of 4 patients (asymptomatic group). MII-pH showed a significant difference between the two groups in both total number of refluxes and number of acidic refluxes (p-values of 0.045 and 0.024 respectively). HRIM showed significant difference between the two groups in distal contractile integral, peristaltic wave amplitude, and the effectiveness of esophageal peristalsis (p-values of 0.004, 0.045, and 0.024 respectively). In the GERD group, there was a significant correlation between the intragastric pressure and the degree of GERD observed in endoscopy, acid exposure time%, and Demeester score (with p-values of 0.046, 0.006, and 0.009 respectively). It was also noted in the same group that the bolus transit time was inversely correlated with the lower esophageal sphincter relaxation% (p-value 0.045), and it affected the QOL significantly (p-value 0.049).

Conclusions This study examines common findings from HRIM and MII pH after LSG, noting increased intragastric pressure and frequent reflux episodes mainly linked to GERD symptoms

caused by ineffective esophageal motility. These advanced diagnostic tools are crucial for ongoing assessment when conventional methods like endoscopy or barium studies fall short. Larger studies with longer follow-up, including pre-LSG and revisional surgery data, are needed to enhance understanding.

Keywords Sleeve gastrectomy; Gastroesophageal reflux disease; High resolution impedance manometry; Multichannel intraluminal impedance pHmetry