International Journal of Surgery 12 (2014) S173–S177

Contents lists available at ScienceDirect

International Journal of Surgery

journal homepage: www.journal-surgery.net

Original research

Gastroesophageal reflux disease and obesity: Do we need to perform reflux testing in all candidates to bariatric surgery?

Salvatore Tolone*, Paolo Limongelli, Gianmattia del Genio, Luigi Brusciano, Gianluca Rossetti, Vincenzo Amoroso, Pietro Schettino, Manuela Avellino, Simona Gili, Ludovico Docimo

Department of Surgery, Second University of Naples, Via Pansini 5, 80131 Naples, Italy

ARTICLE INFO

Article history:
Received 23 March 2014
Accepted 3 May 2014
Available online 22 May 2014

Keywords:
Obesity
GERD
High resolution manometry
Impedance-pH
Bariatric surgery

ABSTRACT

Introduction: Obesity is a strong independent risk factor of gastroesophageal reflux disease (GERD) symptoms and esophageal erosions. However the relationship between obesity and GERD is still a subject of debate. In fact, if in most cases bariatric surgery can diminish reflux by losing a large amount of fat, on the other hand some restrictive procedure can worsen or cause the presence of GERD. Thus, it is unclear if patients candidate to bariatric surgery have to perform pre-operative reflux testing or not.
Aim: of the study was to verify the presence of GERD patterns in patients candidate to surgery and the need of pre-operative reflux testing.
Methods: All patients underwent to a standardized questionnaire for symptoms severity (GERQ), upper endoscopy, high resolution manometry (HRiM) and impedance pH-monitoring (MII-pH). Patients were stratified into: group 1 (negative for both GERQ and endoscopy), group 2 (positive for GERQ and negative for endoscopy), group 3 (positive for both GERQ and endoscopy). A healthy-volunteers group (HV) was assessed.
Results: One hundred thirty-nine subjects (obese, 124; HV normal weight, 15) were studied. Group 1 showed comparable mean LES pressure, peristaltic function, bolus transport and presence of hiatal hernia than HV. Group 2 showed a reduction of these parameters, while group 3 showed a statistical significant reduction in LES pressure, peristaltic function, bolus transport and increase in presence of hiatal hernia.
At MII-pH, Group 1 showed a not significant increase in reflux patterns; group 2 and 3 showed a significant increase in esophageal acid exposure and in number of refluxes (both acid and weakly acid), with group 3 showing the higher grade of reflux pattern.
Conclusions: Obese subjects with pre-operative presence of GERD symptoms and endoscopical signs could be tested with HRM and MII-pH before undergoing bariatric surgery, especially for restrictive procedures. On the other hand, obese patients without any sign of GERD could not be tested for reflux, showing similar patterns to HV.

1. Introduction

The prevalence of gastroesophageal reflux disease (GERD) in adults has continued to increase and currently ranges from 20 to 44% [1,2]. In particular, this escalation is thought to be linked to the global rise in obesity [3–7]. This trend is of concern also because of the prevalence of esophagitis and Barrett's esophagus ranges from 11.8 to 15.5% and from 1.3 to 1.6%, respectively [2,8], thus increasing the risk of developing esophageal adenocarcinoma [9].

Obesity is considered as a risk factor for severe symptomatic GERD often complicated with either ulcerated esophagitis and/or Barrett's esophagus [10,11].

There is a strong, positive association between obesity and GERD in clinical studies. Obese patients have increased numbers of reflux events and oesophageal acid exposure on pH studies [12,14] and an increased risk of erosive esophagitis on endoscopy [15–19].

* Corresponding author.
E-mail address: salvatore.tolone@unina2.it (S. Tolone).

http://dx.doi.org/10.1016/j.ijsu.2014.05.016
1743-9191/

However, the association between obesity and reflux is somewhat controversial, as shown by a recent meta-analysis by Corley and Kubo [20].

Such as morbid obesity, defined as a body mass index (BMI) ≥30 kg/m^2, has risen to epidemic proportions in several Western countries, so too the use of bariatric surgery spread among surgeons.

This kind of surgery is not only capable to obtain a rapid and stable weight loss, but it can often relief obesity-related pathologies. However, these procedures can influence gastroesophageal reflux in various ways, lowering or increasing it. Thus, it is uncertain if a morbid obese patient must always be tested for reflux.

The aim of the current study was to verify the relationship between obesity and presence of GERD, and the consequent need to test or not for reflux morbid obese patients candidate to bariatric surgery.

2. Methods

2.1. Patients

One hundred forty-four consecutive obese patients candidate to bariatric surgery (BMI > 35) were studied prospectively using a standardized esophageal reflux testing protocol, including clinical evaluation, upper endoscopy, high-resolution impedance manometry and combined multichannel intraluminal impedance pH-metry (MII-pH).

Twenty subjects had previous gastric surgery, or huge hiatal hernia and were excluded.

Reflux testing data from the remaining 124 patients (72 men, ages18–58) were analyzed. Patients were enrolled from the Esophageal diagnostic laboratory at Second University of Naples without regard to presenting complaint. Data from 25 healthy volunteers (HV group, BMI 20–25, negative endoscopy, normal HRiM and MII-pH) stored in our database were used as controls. The local Institutional Review Board approved the study protocol, and informed consent was obtained from each subject.

2.2. Clinical evaluation

Anthropometric measures were obtained on all patients (weight, height, body mass index BMI).

The subjects were investigated about presenting symptoms using a questionnaire incorporating a visual analog scale (0–10) for heartburn, regurgitation, dysphagia, and chestpain [21]. Subjects with predominant complaints of heartburn and/or regurgitation were classified as probably having GERD (Symptom+), whereas subjects with predominant complaints of no heartburn and/or regurgitation were classified as Symptoms−.

2.3. Upper endoscopy

Endoscopy was performed according to International guidelines. Presence of esophagitis was graded according to Los Angeles classification [22], whereas the aspect of the gastro-esophageal flap valve was graded according to Hill classification [23]. Subjects with esophagitis and/or abnormalities of flap valve were classified as upper endoscopy probably positive for GERD (UE+).

2.4. High-resolution manometry

Each patient underwent manometrical esophageal function testing using HRiM with a 32- channel probe (Sandhill-HRiM catheter InSight; Sandhill Scientific Inc., Highlands Ranch, CO, USA). Data acquisition, display and analysis were performed using dedicated software (Sandhill Bioview, Sandhill Sci.), after a proper thermal compensation.

The patients underwent transnasal placement of the manometric assembly and the catheter was positioned to record from the hypopharynx to the stomach. Studies were done in a supine position and the manometric assembly was positioned with at least 5 intragastric sensors to optimize EGJ and intragastric recording. The catheter was then taped to the nose. The manometric protocol included at least ten 5-mL swallows and a 5-min period to assess basal sphincter pressure [24].

The lower esophageal sphincter (LES) was localized and its pressure and relaxations evaluated; proximal and distal borders were marked according to pressure difference related to intra-esophageal and intragastric pressure marks. Crural diaphragm (CD) was marked as the axial level characterized by maximal inspiratory pressure augmentation.

In individuals with normal anatomy, LES and CD were superimposed and indistinguishable. Patients were then classified to have normal EGJ or hiatal hernia, based on the presence of axial separation between LES and CD, measured in cm. The gastro-esophageal pressure gradient (GEPG) was calculated using the average values of the simultaneous intraesophageal and intragastric pressure measurements.

Regarding esophageal body contraction, patients were classified to have normal or ineffective motility as well as described in Literature [25]; in brief HRiM motility patterns were graded as the recently developed Chicago Classification [26] by means of esophageal pressure topography. Ineffective (or weak) peristalsis was defined as breaks of 2–5 cm in length in >30% of liquid swallows (small defect) or breaks >5 cm in length in >20% of liquid swallows (large defect) in the 20 mmHg isobaric contour plot. For each liquid swallow, complete bolus transit occurred when the bolus entered the first pair of impedance sensors and exited the second, third and fourth pair of sensors. The study was considered abnormal if complete bolus transit occurred <80% of liquid swallows. Bolus transit time (BTT) was expressed as time in seconds from entrance of the bolus in the proximal channel to the exit in the most distal impedance channel.

2.5. 24 h MII-pH

All patients underwent to outpatient 24 h MII-pH. Patients had to observe fasting since the night before and had to be off medication (any kind of PPI or drugs affecting the normal gastrointestinal motility) at least for 5 days. A dedicated MII-pH catheter (with intraluminal impedance segments positioned at 3, 5, 7, 9, 15 and 17 cm above the LES) (Sandhill Scientific Inc., Highlands Ranch, CO, USA) was placed transnasally, with the esophageal pH sensor positioned 5 cm above the manometrical determined LES. Patients were invited to indicate 3 or more predominant symptoms that occur along the recording time, every meal and changing position in upright or in recumbent, both on the device and on a written diary provided as well. The catheter transmitted information into software included in the device (Sleuth System – Sandhill Scientific Inc., Highlands Ranch, CO, USA). MII-pH data were collected and analyzed with the Bioview GERD Analysis Software (Sandhill Scientific Inc., Highlands Ranch, Colorado, USA). By means of MII-pH, the following variables were assessed: distal esophageal acid exposure as percentage (%) of time with pH < 4 (abnormal if total time with pH < 4 was greater than 6.3%, and/or upright time with pH < 4 was greater than 4.2%, and/or recumbent time with pH < 4 was greater than 1.2%), number and quality (acid and weakly-acid) of reflux detected at MII (normal value <73), and Symptom Association Probability (SAP), as described in Literature [27–29].