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Esophagogastric pathology in morbid obese patient: Preoperative diagnosis and influence in the selection of surgical technique

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ABSTRACT

Introduction: Given the difficulty in accessing to the excluded stomach after gastric bypass and the increase in gastroesophageal reflux after sleeve gastrectomy, it is justified to perform a preoperative fibrogastroscopy.

The influence of the fibrogastroscopy (FGS) findings in the therapeutic approach is analyzed.

Patients and methods: A retrospective study of preoperative FGS findings is performed, from 04/06 to 12/12.

The influence of the FGS results on the surgical technique selection, in the endoscopic or medical treatment and its relation to gastric fistula is analyzed by means of multivariate regression (confounding factors: Age, body mass index, arterial hypertension, diabetes mellitus, antiplatelet therapy, surgical technique (bariatric surgery, sleeve gastrectomy)).

Results: Three hundred thirty one patients are included: 32.6% biopsy of gastric lesion; 27% gastritis; 18.1% hiatal hernia; 3% metaplasia; 0.6% Barrett esophagus; 2.1% esophagitis; 0.3% dysplasia; 0.3 Schatzky's ring; 1.5% incompetent cardia; 2.4% duodenitis; 0.3% gastric erosions; 0.6% gastric xanthoma; 1.8%, gastric polyp; 1.6% duodenal ulcer; 0.6% papulo-erosive gastritis; 0.6% esophageal papilloma; 0.3% submucosal tumor. *Helicobacter pylori*+ 30.2% (triple therapy eradication in all patients). The FGS findings led to a variation in the surgical technique or to the completion of endoscopic treatment in 22.2% of cases.

The gastric lesions did not influence the development of gastric fistula. Independent prognostic factors of fistula: Sleeve gastrectomy (7.9% vs. 2.7%; $p = 0.02$; OR: 1.38 IC95: 1.01-1.87) and the body mass index $> 50 \text{ kg/m}^2$ (6.7% vs. 2.2%; $p = 0.04$; OR: 3.7 IC95: 1.12-12.4).

Conclusions: The diagnosis of gastroesophageal disease through preoperative FGS motivated variations in the therapeutic approach in 52% of patients, so we consider essential to include the preoperative FGS in bariatric surgery.

Key words: Fibrogastroscopy. Preoperative. Obesity. Bariatric surgery.

INTRODUCTION

The morbidly obese patients are at increased risk for gastrointestinal diseases (1,2). The difficulty of access to the excluded gastric remnant after gastric bypass (GB) reinforce the need to rule out gastric pathologies in the preoperative study that could degenerate into malignant lesions in the future (3-6). Identification by FGS of polyps, nodules, gastric or esophageal submucosal lesions allows endoscopic resection or at least to achieving biopsy to pathologic diagnosis. Depending on the result of the biopsy and whether it is performed or not a complete excision of the lesion may be necessary to perform a surgical excision of the affected area simultaneously with the technique of bariatric surgery (BS) or adapt this technique to remove the lesion (7,8). Moreover, some digestive symptoms, such as gastroesophageal reflux disease (GERD) may worsen after the sleeve gastrectomy (SG) or gastric banding (LGB) so it is useful to know its existence before deciding the surgical approach (9). The presence of *Helicobacter pylori* (HP) in the stomach we have to section, may also be important given the influence of this bacterium in the development of premalignant lesions and gastric ulcer; It can be especially dangerous if it remains active within the excluded gastric remnant that cannot be explored easily, as well as increasing the risk of anastomotic ulcers (10).

However, there is still no consensus on the need to include the FGS in the preoperative evaluation of the BS. Several publications show high rates of pathological findings in the FGS previous to BS (11); however, clinical guidelines have not collected a strong recommendation (6,8,12). Some authors recommend to perform FGS to all patients without exception (13-15), others recommend it just in the case of patients with suspected gastric lesion or that will undergo a technique that involves the exclusion

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of part of the stomach (16), while a third group of authors recommend the FGS only in patients who develop symptoms or clinical suspicion of gastric lesion (dyspepsia, heartburn, epigastric pain...) (17,18).

The purpose of preoperative FGS would diagnose and/or treat lesions that could potentially affect the surgical technique; that could cause complications in the immediate postoperative or cause intolerable symptoms after CB. The aim of this study was to assess the prevalence of esophageal-gastric lesions in BS candidate, the influence of these lesions in the therapeutic management of morbidly obese patient and the value of the results of the FGS algorithm for selecting surgical technique.

PATIENTS AND METHODS

A retrospective review of a prospectively collected database of patients consecutively referred for BS in the University Hospital of Pontevedra, Spain (CHOP) was carried out. In all patients a preoperative FGS was performed. If possible, the lesions were removed endoscopically, or biopsied. In all cases the presence of HP was determined by urease test. The GB was the standard technique in most cases. SG was offered in patients with body mass index (BMI) under 45 or over 55 with severe comorbidities. To patients with a BMI > 50, the intragastric balloon (IB) was offered to assist preoperative weight loss for 6 months. In all cases, the choice of technique was made by consensus with the patient after expose the pros and cons of each treatment option. The existence of esophageal or gastric lesions on endoscopy was assessed before deciding the final technique, when necessary surgical gastric area affected by the injury diagnosed in the FGS was removed. In the database changes in surgical technique or drug treatment due to the findings of the FGS were recorded. Other variables were: age, sex, BMI, previous comorbidities –hypertension, OSAS, diabetes mellitus (DM)...–, hospital stay, major postoperative complications (pneumonia, gastric fistula, jejunal fistula, gastrointestinal bleeding, hemoperitoneum, atelectasis, stenosis, and intra-abdominal abscess), and mortality (Table I).

A descriptive analysis of the variables prospectively collected in the database was performed, and the gastroesophageal lesions found in preoperative FGS and changes in the therapeutic strategy were evaluated.

As a secondary analysis, using multivariate logistic regression, the possible relationship between gastric lesions with postoperative gastric fistula, defined as leakage of gastrointestinal material through mechanical or manual sutures, evinced by contrast extravasation on

a radiological study and/or identification of methylene blue leakage or gastrointestinal material in re-exploration. Potential confound factors as age, sex, BMI, surgical technique, comorbidities, antiplatelet therapy, smoking, previous HP+ and BIB carrier, are included.

Statistical analysis was performed using SPSS 20.0 statistical package.

RESULTS (Table II)

Descriptive

Three hundred thirty one patients undergoing BS at CHOP between April 2006 and December 2012 are included. Eighty two percent of patients were women, with a mean age of 39.9 years (range 18-63). Thirty two percent of patients were super obese; being the average BMI of the entire series 47.5 (range 35-71) as for comorbidities, 40.8% were hypertensive, 14.8% had diabetes, and 3.6% were diagnosed with OSAS. 4.9% of patients using antiplatelet therapy.

Preoperative FGS results

Preoperative FGS was performed in 331 patients. In 108 (32.6%) patients biopsy was performed in macroscopic

Table II. Results

Variable	Fistula %	p	OR (IC95)
BMI > 50	4.2 vs. 1.9	0.479	ns
SG vs. GB	7.9 vs. 2.7	0.02	3.688 (1.089-12.494)
Gastric lesions	3.4 vs. 3.9	0.264	ns
Men	4.0 vs. 3.8	0.95	ns
AHT	3.0 vs. 4.1	0.593	ns
Diabetes	3.7 vs. 3.6	0.973	ns
<i>Helicobacter pylori</i> +	4.1 vs. 3.5	0.807	ns
Antiplatelet treatment	6.2 vs. 3.5	0.459	ns
OSAS	0.0 vs. 3.8	0.494	ns
Intragastric balloon	7.5 vs. 2.9	0.077	3.5 (0.972-13.221)

Table I. Demographic features, comorbidities, surgical technique

Demographic features (n = 331)	Associated comorbidities (%)	Surgical technique (%)
Age (mean, SD, range)	AHT 40.8	Gastric bypass 79
Sex (%)	DM2 14.8	Sleeve gastrectomy 19
	Asthma 7	Other 2
Weight (kg) (mean, SD, range)	Dyslipidemia 3,9	
BMI (mean, SD, range)	OSAS 3.9	
Smokers (%)		

ic lesions. Eighteen percent had a hiatal hernia, 27% of patients were diagnosed with gastritis on biopsy. Other lesions diagnosed less frequently were: 3% metaplasia, 0.6% Barrett esophagus, 2.1% esophagitis, 0.3% dysplasia, 0.3% Schatzki's ring, 1.5% incompetent cardia, 2.4% of duodenitis, 0.3% gastric erosions, 0.6% gastric xanthoma, 1.8% gastric polyps, 1.6% duodenal ulcer, 0.6% papulo-erosive gastritis, 0.6% esophageal papilloma, and 0.3% submucosal tumor.

In cases of xanthoma, papillomas and polyps, endoscopic resection was performed (representing a 4.2% of all patients).

The HP was positive in 30% of patients; all of them received triple therapy for eradication (clarithromycin 500 mg /12 h v.o. + amoxicillin 1 g /12 h v.o. for 1 week and omeprazole 20 mg /12 h v.o. for 1 month). One month after completing the treatment, Ag determination was performed on feces being positive in 4.2%, in these cases a second-line therapy with levofloxacin 500 mg /12 h v.o. + amoxicillin 1 g /12 h v.o. + omeprazole 20 mg /12 h v.o. for 14 days is administered. Ag HP test in feces was repeated and was negative in all cases.

Fifty-three patients (16%) agreed IB placement for preoperative weight loss. Ninety-six per cent maintained it for six months and in 2 cases had to be removed earlier because of intolerance.

Two hundred sixty gastric bypasses (79%), 63 sleeve gastrectomies (19%) and other techniques in 2.1% of patients were performed.

Postoperative mortality was 0%. Nine percent of patients had postoperative complications (in some cases more than one). Complications were: 1 intra-abdominal abscess, 3 high gastrointestinal bleeding, 2 hemoperitoneum, 10 gastric fistulas and 2 J-J anastomosis fistula, 2 pneumonia and 15 atelectasis. The median hospital stay was 5 days (mean 6.9 ± 9.3).

Influence of the gastroscopy results in the therapeutic approach

In 22.6% of patients, a variation in surgical/therapeutic approach due to the results of the FGS was performed; 4.2% of potentially premalignant lesions (esophageal and gastric polyps, papillomas, xanthomas) underwent endoscopic resection; 3.3% of surgical technique was changed to resect lesions, GB associating gastrectomy or SG. In 15.1%, GB was performed instead of SG because of gastroesophageal reflux.

In 30% of patients, drug treatment (to eradicate HP) was added; 4.2% of patient's surgery was delayed two months to complete the second-line treatment of HP and verify its eradication.

Globally, the determination of gastroesophageal lesions in the preoperative study prompted changes in the therapeutic approach of 52.6% of procedures.

Gastric lesions influence as a predictor of postoperative fistula

The gastroesophageal lesions (gastritis, esophagitis, hiatal hernia) showed no statistically significant relationship with postoperative fistula in the multivariate analysis including potential confounders such as age, sex, BMI, comorbidity (DM, hypertension, dyslipidemia, OSAS, smoking), antiplatelet therapy, surgical technique or have carried intragastric balloon.

The only independent factors that showed significant association with postoperative fistula were surgical technique, being more frequent in sleeve gastrectomy ($p = 0.02$; OR: 1.38 CI95: 1.01-1.87) and super obesity (BMI > 50 kg/m²) ($p = 0.04$; OR: 3.7 IC95: 1.12-12.4).

DISCUSSION

The selection of the most appropriate surgical technique for each morbidly obese in centers with extensive experience, often varies depending on the demographic characteristics of the patient, their eating habits or preferences; however, there is few data concerning the influence of preoperative FGS in the decision. In our study, performing preoperative FGS to 331 candidates for bariatric surgery changed to some extent the medical treatment of patients by 30%, and influenced the selection of the surgical technique in 22.6%. This high percentage justifies, in our opinion, the systematic use of FGS to all candidates for bariatric surgery, even those who have no digestive symptoms; this view is shared by some authors and collected in various clinical guidelines, but there is still no consensus on inclusion in the preoperative evaluation of bariatric surgery (2,12,19). Opponents say that the systematic FGS leads to additional cost and it is an invasive technique that causes discomfort to the patient, and may even be a risk of aspiration; however, there are no reliable studies with enough scientific evidence to support the non-performance of the FGS and most guidelines are based on recommendations with evidence level 2 or 3, as in the case of the EAES (European Association Endoscopic Surgery) recommends as a C level performing a barium study or FGS in candidates for bariatric surgery (19). HP detection, moreover, is also a subject of controversy today; some guides even give it more importance than to the FGS alone, such as the European Interdisciplinary Guide for morbid obesity surgery, which recommends the systematic detection of HP but routine FGS (20) is not considered necessary. In our series, 30% of cases of HP+ were detected and eradicated with a single course of treatment in 94% of patients; which indicates low resistance in our area. This prevalence is somewhat lower than the estimated HP in our country being at around 40% depending on the studied region (21). One possible explanation for the prevalence differences could be the diagnostic test used. Detection of HP in our

study was performed by urease test and gastric biopsy and we do not know if there could be a variation in the prevalence if it had been used another diagnostic technique such as *H. pylori* antigen detection in feces.

Eradication of HP seems more important when leaving the stomach excluded as in the gastric bypass.

In our series, with 79% of gastric bypass, detection and eradication of HP is considered essential since the start of the study; even more when endoscopic findings as hiatal hernia or reflux made us change the surgical technique. The American Society of Gastrointestinal and Endoscopic Surgeons (ASGES) guideline recommends performing FGS only in symptomatic patients and treating patients with HP+; however, it does not specify if it is necessary to determine HP in all patients (22). In our opinion, following this indication a large number of patients would remain undiagnosed given that almost half of our patients reported no digestive symptoms, so the FGS would had not been made and neither the detection of HP. Moreover, the finding of pathology in FGS is not always according to patients with symptoms; this same has been reported by other authors showing that asymptomatic patients had the same percentage of gastric lesions that symptomatic (8,23).

Additionally, we believe that each center must consider the demographics of the population it serves and the prevalence of HP in each area, as well as the rate of resistant strains.

Regarding gastric lesions detected in the FGS there are several studies that demonstrate highly variable percentages of detected lesions in morbidly obese patients ranging between 5 and 90% of the patients (2,18,24). Stands the Verset series (14) in which the therapeutic management in 42% patients changed because of the findings on preoperative FGS; 63% patients had hiatal hernia or incompetent cardia being 70% asymptomatic; 31% had esophagitis (50% asymptomatic); 17% gastritis, gastric ulcer in 15% (70% asymptomatic, and 5% duodenal ulcer, all asymptomatic).

Other authors modified the therapeutic attitude in a lower percentage (4.9% reported by Schirmer et al.) but considering the FGS as a good tool for the study of the candidate for bariatric surgery both in preoperative and postoperative or monitoring (15,25). In general the most frequent lesions described are hiatal hernia (20-40%), gastritis (20-30%) and esophagitis (1-15%) (7,18,26,27).

The FGS is also of great importance in preoperative diagnosis of gastroesophageal reflux for technical selection and really defines which patients with this disease (28) are, since the decision of the surgical technique has changed in recent years based on the presence or absence of reflux. The prevalence of reflux in the morbidly obese population is variable and ranges from 50-70% of patients (11). The prevalence of hiatal hernia is also variable and published figures range from 10-40% in bariatric surgery candidates (11,26). When SG technique was described by Gagner et al. in 2002 (29) reflux was not considered a contraindication for this type of technique; however, subsequent publications have highlighted a striking incidence of gas-

troesophageal reflux in patients undergoing this technique and showed a worsening of symptoms in patients with previous reflux (26,30-32) therefore, since 2009 there is an upward trend about considering gastro-esophageal reflux a contraindication for a SG, as in the case of the LGB. In our center there had been performed 10 SG in patients with hiatal hernia or gastroesophageal reflux until that date; 4 of these 10 patients developed severe reflux symptoms during follow-up; one of them could be controlled with drugs but in three cases it was disabling despite treatment and we decided to convert to gastric bypass obtaining a complete remission of symptoms.

From 2009, we avoided SG in patients with preoperative reflux symptoms or moderate-large hiatal hernia in FGS so in all these cases a gastric bypass (53 patients) was performed. None of the patients with preoperative reflux or hiatal hernia who underwent gastric bypass had reflux symptoms at follow up. For this reason, our attitude today remains the contraindication of SG in patients with reflux or hiatal hernia. However, the results of other groups published in recent years are contradictory. In a review of the literature published in 2011 by Chiau et al. (33), publications with very different results are given, as well as many scientific papers, but none of them provides sufficient evidence to establish a clear recommendation (9,34-35).

CONCLUSION

The completion of preoperative fibrogastroscopy diagnosed gastroesophageal macroscopic lesions in 32.6% of patients, 18.1% reflux disease or hiatal hernia was diagnosed and 30% for the presence of HP was evidenced. Endoscopic findings led to changes in the therapeutic approach in 52.6% of procedures, given that in 22.6% of patients the surgical technique indication was changed or endoscopic resection of lesions was performed and in 30% was necessary to administer a previous drug treatment to surgery and verify its effectiveness. In our study fibrogastroscopy has been essential in the treatment algorithm of candidates for bariatric surgery of Salnés-Pontevedra area (Spain) so we consider essential its systematic inclusion in the protocol of preoperative assessment for bariatric surgery candidates.

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