

Patients Having Bariatric Surgery: Surgical Options in Morbidly Obese Patients with Barrett's Esophagus

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Published online: 11 May 2016
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Abstract This article summarizes the currently knowledge and results observed in patients with obesity and Barrett's esophagus which were presented and discussed during the IFSO 2014 held in Montreal. In this meeting, the surgical options for the management after bariatric surgery were discussed. For this purpose, a complete revision of the available literature was done including Pubmed, Medline, Scielo database, own experience, and experts opinion. A total of 49 publications were reviewed and included in the present paper. The majority of authors agree that gastric bypass is the procedure of choice. Sleeve gastrectomy is not an absolute contra-indication. Up to now, gastric bypass appears to be the best procedure for treatment of obese patients with Barrett's esophagus. Future investigations should give the definitive consensus.

Keywords Obesity · Barrett's esophagus · Gastric bypass

Introduction

Barrett's esophagus represents an interesting issue, with many different considerations that deserve to be discussed. Concerning to the options of surgical treatment for obese patients with Barrett's esophagus, Roux-en-Y gastric bypass has been suggested as the best alternative. Otherwise, sleeve

gastrectomy with the addition of some antireflux procedures in order to avoid reflux also has been suggested.

In these article, we report the current knowledge and author's opinion presented and analyzed during the IFSO symposium 2014. These data should promote future investigations and discussions.

Material and Method

For this purpose, a complete revision of the available literature was done base on Pubmed, Medline, Scielo database, and also author's experience were obtained. We included a total of 49 publications, performing an analysis of the reported results concerning to clinical and objective improvement of Barrett's esophagus at long-term follow-up, which are included and discussed in this article.

Results and Discussion

Overweight and obese persons are at increased risk for gastroesophageal reflux disease (GERD). Body mass index (BMI) is associated with symptoms of gastroesophageal reflux in both normal-weight and overweight women, and moderate weight gain among persons of normal weight may cause or exacerbate symptoms of reflux [1]. Previous studies have demonstrated that obese patients present GERD symptoms, esophagitis, and Barrett's esophagus (BE). Among patients with obesity, 79 % of them present heartburn and 66 % present regurgitation. During endoscopic examination, nonerosive reflux disease (NERD) was found in 24 % of patients, 49 % present macroscopic erosive esophagitis, 18 % short Segment Barrett's esophagus (SSBE), and 9 % present long segment Barrett's esophagus (LSBE) [2]. A meta-analysis regarding obesity and risk of GERD [3] shows that obesity is associated with statistically significant increase in the risk of GERD

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symptoms, erosive esophagitis and esophageal carcinoma [3]. These complications increase progressively with increasing weight. Other studies have demonstrated that in obese patients, erosive esophagitis is 1.25 times more frequent and Barrett's is 3 times more frequent compared to normal weight subjects. The odds ratio (OR) for GERD in obese patients with BMI > 35 kg/m² is 2.6–6.3, for long segment Barrett's esophagus (LSBE) is 4.3 and for adenocarcinoma is 16.2 [4–7]. Changes in gastroesophageal anatomy and physiology caused by obesity may explain this association. These include an increased prevalence of esophageal motor disorders, diminished lower esophageal sphincter (LES) pressure, the development of a hiatal hernia, and increased intragastric pressure. Central adiposity may be the most important factor for the development of reflux and related complications such as Barrett's esophagus and esophageal adenocarcinoma [7]. Perez [8], comparing the presence of Barrett's esophagus in normal subjects, overweight or obese patients, observed BE in 11.2, 19.1, and 19.5 %, respectively. In obese patients with GERD or Barrett's esophagus, there are two problems:

- (a) Gastroesophageal reflux
- (b) Obesity

In order to obtain simultaneously improvement of reflux and obesity, patients must be submitted to surgical procedures accomplishing both purposes, that is, to stop reflux minimizing recurrences and to improve obesity. The surgical options for treatment are the following:

1. Fundoplication alone: late results are not as good as in patients who are not severely obese and besides, does not treat obesity. Morgenthal [9] demonstrated that one of the important factors for recurrence of GERD after laparoscopic Nissen fundoplication is obesity. Preoperative morbid obesity with BMI > 35 kg/m² was clearly associated with failure after surgery ($p = 0.036$) and high rate of recurrence of gastroesophageal reflux disease has been demonstrated after fundoplication in many reports [8–10]. In our own experience, we reported almost 50 % of recurrent reflux after fundoplication alone in obese patients [11].
2. Bariatric surgery: it has been suggested as a potential alternative treatment for obese patients in order to treat reflux and obesity. The current surgical therapies for severe obesity include Laparoscopic Roux-en-Y gastric bypass (LRYGBP), laparoscopic adjustable gastric banding (LAGB), laparoscopic sleeve gastrectomy (LSG), and laparoscopic biliopancreatic diversion with duodenal switch (LBPDS) [12]. These procedures have been analyzed by several authors with different results. According to the experience reported by Italian authors [13], they found reduction of basal lower esophageal sphincter

pressure and increase of acid reflux after vertical band gastroplasty and they suggest that this technique cannot be considered for patient with reflux. Other authors agree with this idea [14, 15].

Korenkov [16], comparing the results after LAGB and LRYGBP, found no significant difference regarding reflux symptoms after these procedures. On the contrary, among the majority of the authors there is almost consensus when comparing these two techniques, obtaining significant improvement of reflux symptoms after LRYGBP. Merrouche demonstrated increased acid reflux after LAGB and decreased acid reflux after LRYGBP [17]. Ortega [18] reported 60 % of reflux after LAGB and 15 % after LRYGBP 1 year after surgery. The laparoscopic adjustable gastric banding (LAGB) group presented symptomatic GERD in 30 % and pH-metric reflux in 60 % of patients. In patients with preoperatively defective esophageal body motility, Klaus demonstrated that LAGB may aggravate GERD symptoms and, therefore, alternative bariatric surgical procedures should be considered in these patients [19].

Varela [20] published “de novo” Barrett's esophagus after LAGB as a late complication due to this procedure. Therefore, this technique is not advisable for Barrett's esophagus in obese patients [19, 20]. In Table 1, a summary of recurrence rate comparing fundoplication, LAGB, and LRYGBP in obese patients is shown.

Concerning to Sleeve gastrectomy and Barrett's esophagus, there are enough evidences in the literature that this procedure promotes an abnormal reflux into the esophagus. Impedance reflux episodes were also frequently observed after SG (52 %) and were significantly associated with gastroesophageal reflux symptoms and ineffective esophageal motility [23]. The majority of authors agree with this sentence [23–27], but for others, this technique alone or combined with some type of fundoplication or hiato-plasty can be indicated for control of reflux in obese patients [28–32]. There are few papers which demonstrated amelioration of GERD after LSG. On the contrary, other 10 papers

Table 1 Results in obese patients and Barrett's submitted to fundoplication, laparoscopic adjustable gastric band, and laparoscopic Roux-en-Y gastric bypass in terms of recurrence rate of reflux symptoms or persistent esophagitis after surgery

Surgery	Reflux symptoms or esophagitis
Laparoscopic Fundoplication (n = 390)	28–60 % ^a
Laparoscopic AGB (n = 616)	31–60 % ^b
Laparoscopic RYGBP (n = 964)	12–15 % ^c

^a References [8, 9]

^b References [6, 12, 13, 18, 19]

^c References [11, 12, 18, 21, 22]

demonstrated worsening or “de novo” reflux after LSG [21, 33, 34] (Table 2).

Regarding the effect of LRYGBP, Mejia-Rivas et al, in his paper confirmed decrease in reflux symptoms, proton pump medication, and acid reflux after this in patients with morbid obesity [39], and Cobey [40] demonstrated complete regression of Barrett’s esophagus after LRYGBP. This observation confirmed our idea suggesting this technique as an excellent strategy for patients who have morbid obesity associated with abnormal reflux and Barrett’s [40, 41].

Comparing the evolution of erosive esophagitis in patients who underwent laparoscopic Roux en Y gastric bypass (LRYGBP), LAGB, and laparoscopic sleeve gastrectomy (LSG) 1-year after surgery, a worsening of erosive esophagitis was observed in the LSG group, in contrast with the improvement in the LRYGBP group [21, 22, 33, 35–38] (Table 3).

In patients with Barrett’s esophagus and obesity, Csendes reported that symptoms of reflux esophagitis, which were present in 14 out of 15 patients, disappeared in all patients 1 year after surgery. Preoperative erosive esophagitis and peptic ulcer of the esophagus healed in all patients, and there was regression from intestinal metaplasia to cardiac mucosa in four patients (57 %) with short-segment BE, and in one patient (20 %) with long-segment BE [22, 35]. Cases with intestinal metaplasia of cardia (CIM) also had regression to cardiac mucosa. There was no progression to low- or high-grade dysplasia. This is due to a complete abolition of duodenal reflux and a significant decrease of acid secretion, refluxates which are harmful to esophageal mucosa.

According to these data, gastric bypass in patients with Barrett’s esophagus and morbid obesity could be an excellent antireflux operation, proved by the disappearance of symptoms and the healing of endoscopic esophagitis or peptic ulcer in all patients, which is followed by an important regression to cardiac mucosa. These results were confirmed in other experience comparing LRYGBP or fundoplication combined with vagotomy-antrectomy and Roux-en-Y gastrojejunostomy (FVARYGJ) [36] The more recent results obtained by our

Table 2 Worsening or amelioration of GERD after LSG

N° papers	Patients included	Results
Worsening		
10	5609	“de novo” reflux symptoms (12–47 %) Esophagitis (15 %) Increase PPI’s medication (58 %) Barrett’s appearance (1.2 %)
Amelioration		
3	311	Improvement or decrease in symptoms 49 %

References [21, 22, 33, 35–38]

Table 3 Evolution of erosive esophagitis in patients who underwent LRYGB or LSG after a 1-year postoperative period

	Preop	Postop
LSG (n=33)	23.8 %	45.2 %
LRYGBP (n=32)	28.6–53 %	0–6.3 %

(p=0.0007)

Reference [22, 42]

group in obese patients with Barrett’s esophagus submitted to LRYGBP are shown in Table 4.

In addition, current publications concluded that laparoscopic conversion of Nissen fundoplication to Roux-en-Y gastric bypass is technically feasible and safe operation for recurrent gastroesophageal reflux disease in the morbidly obese, resulting in effective weight loss, and control of GERD and its complications. Therefore, LRYGBP may be the procedure of choice in morbidly obese patients with prior anti-reflux surgery, and in obese patients requiring surgical treatment for gastroesophageal reflux disease. The recent papers suggest that obese patients with Barrett’s esophagus should be submitted to gastric bypass in order to treat reflux and obesity in the same operation [37, 38]. In our opinion, laparoscopic Roux-en-Y gastric bypass is the best option for morbid obese patients with Barrett’s esophagus. In addition, in a recent publication Altieri concludes that Roux-en-Y gastric bypass is associated with decrease incidence of GERD and is the procedure of choice for obese patients with GERD and for patients with Barrett’s esophagus [21, 23].

However, the question if sleeve gastrectomy is always an absolute contraindication in patients with Barrett’s is currently valid and it merits some discussions according to the opinion of Gagner and other authors [43–45].

Finals comments Currently, there is consensus that obesity is associated with high rate of GERD and Barrett’s esophagus [48]. There is also agreement that the best surgical procedure for Barrett’s esophagis in obese patients is LRYGBP.

But regarding with the discussion on LSG and GERD, the reported experiences available in the literature have generated a great controversy. However, in the more recent data, it is possible to observe a clear tendency that after LSG, significantly decrease of LESP associated with significantly increase

Table 4 Laparoscopic treatment of obese patients with GERD and long segment Barrett’s esophagus: a prospective Study (n=56)

Reflux symptoms	Preop	Postop
	56 (100 %)	2 (3.5 %)
Erosive esophagitis	56 (100 %)	3 (5.3 %)

of reflux DeMeester score is seen. Therefore, high rate of “de novo” GERD has been observed during follow-up. Appearance of Barrett’s esophagus has also been published [46–49]. In conclusion, the current controversy has to promote a future discussion in this topic and it is necessary to have more clinical and objective investigations in order to obtain the final consensus.

Compliance with ethical standards This article does not contain any studies with human participants or animals performed by any of the authors.

Conflict of interest The authors declare to that they have no conflict of interest.

Ethical approval This paper includes studies done in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed consent For this article, informed consent does not apply.

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