

Biliary Gastritis Following Laparoscopic Mini Gastric Bypass: Is there a Role for H. Pylori?

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ABSTRACT

Background: Obesity is considered now in the twenty first century one of the major health problems that affect many aspects of individual's health. Morbid obesity is believed to be the second leading cause of preventable death behind cigarette smoking. Laparoscopic Mini Gastric bypass (LMGBP) is increasingly performed for morbidly obese patients and has recently gained popularity and acceptance as an effective procedure for the treatment of morbid obesity and improvement of obesity-related comorbidities. Safety and satisfactory short and long term outcomes of LMGBP have been reported in large series. A high incidence of biliary gastritis of around 70% after Mason's old loop gastric bypass has been reported. This has resulted in increased use of Roux-en-Y reconstruction in the performance of gastric bypass. **Aim of work:** This study was conducted to evaluate the incidence of biliary gastritis following LMGBP and to figure out the association of H. pylori with the occurrence of postoperative gastritis. **Methodology:** This pilot study included 20 patients. All of them underwent a LMGBP as a primary one-stage bariatric procedure in Kasr Alaini university hospital, general surgery department, faculty of medicine, Cairo University in a period of 12 months, from January 2015 to January 2016 with a follow up period of 6 months. All 20 patients had an upper GI endoscopy done at 6 months postoperative. Gastric aspirate was obtained to assess bilirubin level. Gastric and esophageal biopsies were taken and submitted for histopathology and campylobacterlike organism CLO test. CLO test was done selectively on preoperative endoscopy for patients with positive endoscopic findings. **Results:** Endoscopy findings at 6 months postoperative: Nine patients out of twenty had normal gastric and esophageal mucosa. Mild gastritis and esophagitis were evident in 9 patients. Severe esophagitis, gastritis with ulcers, polyps and erosions appeared in 2 patients. Gastric biopsy confirmed endoscopic findings in 12 patients who had normal mucosa or evidence of mild gastritis. 8 patients had moderate to severe gastritis (2 of them had erosions and metaplasia on top). There was no relationship of statistical significance between results of H.pylori test and the findings of histopathological examination of gastric biopsy with a P value of 1.0. This study highlighted the safety of MGBP in our Hospital setting. No mortality, low morbidity with quick postoperative recovery. Incidence of biliary gastritis was 6/20 (30%). **Conclusion:** The rate of biliary gastritis post LMGBP needs more studies on larger sample size with longer follow up period for proper assessment of incidence of biliary gastritis and association with H.pylori.

Keywords: Mini Gastric bypass - Biliary gastritis – H.Pylori

INTRODUCTION

Morbid obesity is expanding worldwide [1] and increasing levels of obesity are associated with increasing risk of comorbidities and of death [2]. Obesity is associated with an increased mortality risk [3], as well as increased health costs. A BMI \geq 35 kg/m² is associated with a 200% increase in health care costs compared to the normal weight range [4]. Long-term studies show that bariatric procedures cause significant long-term loss of weight, recovery from diabetes, improvement in cardiovascular risk factors, and a reduction in

mortality of 23% from 40%. Bariatric surgery has been shown to be the most efficacious option for managing severe obesity [5].

Laparoscopic Mini Gastric bypass (LMGBP) first reported by Rutledge [6] is increasingly performed for morbidly obese patients. Safety and satisfactory short and long term outcomes have been reported in large series [7]. Centers have published their 10 year experience with the procedure [8]. A randomized controlled trial comparing Laparoscopic Roux-en-Y Gastric bypass (RYGBP) versus LMGBP concluded that both procedures were effective for morbid obesity

with similar results for resolution of metabolic syndrome and improvement of quality of life. LMGBP is a simpler and safer procedure that has no disadvantage compared with RYGBP at 2 years of follow-up[9].

A high incidence of biliary gastritis of around 70% after Mason's old loop gastric bypass has been reported^[10]. This has resulted in increased use of Roux-en-Y reconstruction in the performance of gastric bypass.

McCarthy et al., reported the incidence of macroscopic and microscopic gastritis with different ways of restoration of gastrointestinal continuity after gastric bypass. According to his study, Roux-en-Y reconstruction was associated with least incidence of macroscopic gastritis (13%) compared to loop bypass (71%) even with the addition of Braun anastomosis (45%)^[11].

In other studies, the incidence of symptomatic biliary gastritis after LMGBP was 0.05% according to Rutledge et al., These patients required revision surgery and addition of Braun anastomosis^[6]. Musella et al. reported an incidence of 0.9%. None of these patients required surgery^[7].

The clinical importance of this gastritis is not clear because of the lack of follow-up data. However, similarity between LMGBP and Billroth II is not in favor that LMGBP patients are more at risk of developing gastric cancer. The only reported case of gastric cancer post LMGBP was in the excluded stomach and hence not related to bile reflux^[12].

H. Pylori is a major risk factor for gastric cancer. One would expect a change in gastric pH after LMGBP especially for patients with biliary reflux. Theoretically this should make these patients more prone for H. Pylori proliferation.

This study aims primarily at evaluating the incidence of Biliary Gastritis and H.pylori infection after LMGBP for 20 morbidly obese patients of the Egyptian population.

PATIENTS AND METHODS

This pilot study included 20 patients. All patients underwent a LMGBP as a primary one-stage bariatric procedure using the same surgical technique in Kasr Alaini university hospital, general surgery department, faculty of medicine, Cairo University in a period of 12 months, from

January 2015 to January 2016 with a follow up period of 6 months.

Preoperative evaluation followed the same standard protocol and included thorough history, complete endocrinal workup, psychological evaluation, and counseling by a dietician. All patients underwent upper abdominal ultrasonography to look specifically for gallstones. Oesophago-gastro-duodenoscopy (OGD) was routinely performed for all patients.

Subjects were considered appropriate candidates for the present study if they were aged between 18–65 years, with BMI of $\geq 40\text{kg/m}^2$, or between 35kg/m^2 and 40kg/m^2 with obesity related disease (DM, hypertension). Moreover, they had to agree upon long term follow up (6 months postoperative).

Patients with type II Diabetes, Sweet eaters were advised to have LMGBP. Only Patients with reflux symptoms or with evidence of severe reflux on OGD were advised to have Roux-en-Y Gastric bypass. Informed written consent was obtained from all patients. Patients willing to participate in our study consented to have an Upper GI endoscopy done at 6 months post operatively. Thromboembolic prophylaxis with subcutaneous low molecular weight heparin was routinely prescribed to all patients during their hospital stay and continued at home for 2 weeks.

Surgical procedure

All procedures were performed under general anaesthesia with the patient in supine position and the surgeon positioned between the legs of the patient (French position) after applying compression stockings on the patient's legs. Patients were firmly secured to the operating table to allow for placement in the anti-Trendelenburg position as required.

We use a 5-port technique. We perform an antecolic end-to-side gastrojejunostomy using 45mm stapler. Remaining enterotomy is closed in 2 layers with a running suture. We routinely use an anchoring stitch between the afferent loop and the gastric pouch in an attempt to decrease chances of biliary reflux.

Bleeding from staple lines is controlled by liga clips. We perform a routine methylene blue test to check integrity of anastomosis. Patients have a gastrograffin meal on day 1 postoperatively before they are allowed oral intake. They get discharged either at the end of day 1 or day 2 postoperative on Proton pump inhibitors with

written instructions regarding diet and supplements.

Postoperative Follow up

The weight loss assessments included the absolute change in weight, the change in BMI, and the percentage of excess Body weight loss (%EBWL). The weight was measured at the initial screening visit, 1 month, 3 months, and 6 months after surgery. Preoperative comorbidities were followed up postoperatively at 1 month, 3 months, and 6 months.

In addition to routine assessment at these visits, patients were asked to fill questionnaire to

assess reflux symptoms by using gastrointestinal short form questionnaire (GSFQ score)^[13]. (Fig. 1)

All 20 patients had an upper GI endoscopy done at 6 months by a single endoscopist. Gastric aspirate was sent for bilirubin level assessment. Gastric and esophageal biopsies were taken and submitted for histopathology and CLO test. CLO test was done selectively on preoperative endoscopy for patients with positive endoscopic findings.

GASTROINTESTINAL SHORT FORM QUESTIONNAIRE (GSFQ)					
Instructions: Answer each question by checking one box. If you are unsure about how to answer a question, please give the best answer you can. These questions are about how stomach problems have affected you during the past week;					
How much of the time during the past week:	all of	most of	some of	a little of	none of
	the	the	the	the	the
	time	time	time	time	time
1-Have you had pain or discomfort in the upper abdomen (such as burning, bloating or fullness)?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2-Have you had pain or discomfort in the area of the breast bone (such as heartburn, fullness or sensation of blockage)?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3-Have you been limited in eating a normal meal or in your choice of foods or beverages because of your stomach problems?.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4-Do you experience a rising, spreading, burning sensation behind your breastbone (heartburn)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. During the past week, have your normal daily activities been affected by your heartburn					
<input type="checkbox"/> No					
<input type="checkbox"/> Yes..... If yes, how many days of normal daily activities have been affected during the past week? _____(days)					
6. During the past week, has your sleep been disturbed because of your heartburn?					
<input type="checkbox"/> No					
<input type="checkbox"/> Yes..... If yes, how many nights of your sleep have been disturbed during the past week? _____(nights)					

Fig. (1): Gastrointestinal Short Form Questionnaire(GSFQ)[13]

Statistical analysis

SPSS (Statistical Package for Social Science) software v 15.0 for windows was used for statistical analysis (SPSS Ione, IL, VSA). Fisher Exact Test was used to assess statistical significance due to small sample size. P value less or equal to 0.05 is considered statistically significant whereas a P value less or equal to 0.01 is considered highly significant.

RESULTS

20 patients (16 females and 4 males) with a mean age of 34±1.5 years (18-65 years) and a median BMI of 47 (38-61 kg/m²) had uneventful LMGBP. All patients were discharged maximum 48 hours post operatively. They were all reviewed in outpatient clinic 1 week post discharge. One patient experienced calf DVT 15 days postoperatively and was treated at home by therapeutic dose of anticoagulant.

Seven out 20 patients had Type II diabetes and 3 of them were hypertensive. All of them stopped their medical treatment by the time of OGD.

Among 20 patients the average EBWL at 6 months postoperatively is 74 % with a minimum of 60% and a maximum of 84%.

At 1 month, 17 patients had dyspeptic symptoms with an average GSFQ score of 18 out of 22. At 3 months, 14 patients were symptomatic with an average score of 14. At 6 months, 11 patients still symptomatic with an average score of 14. (fig.2)

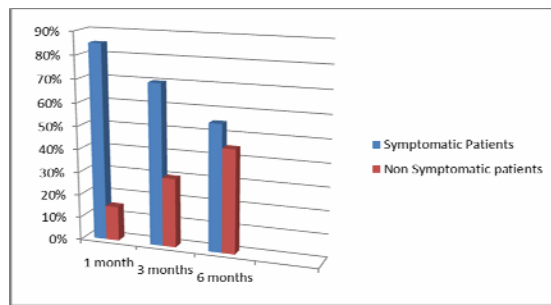


Figure (2): Dyspeptic symptoms 1, 3, 6 months post operatively

Regarding endoscopy findings 6 months postoperative, nine patients out of twenty had normal gastric and esophageal mucosa. Mild gastritis and esophagitis were evident in another 9

patients. Severe esophagitis, gastritis with ulcers, polyps and erosions appeared in 2 patients (fig. 3).

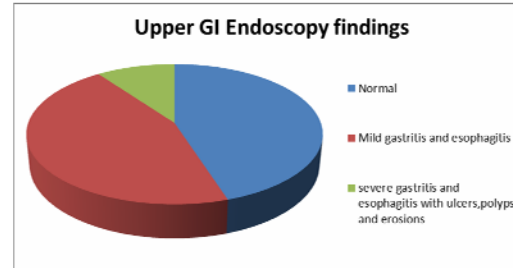


Fig. (3): Upper GI Endoscopy findings 6 months postoperative

Gastric biopsy was taken by upper GI endoscopy 6 months postoperative for all patients and was sent for histopathological examination. It confirmed endoscopic findings in 12 patients who had normal mucosa or evidence of mild gastritis. 8 patients had moderate to severe gastritis with 2 of them having erosions and metaplasia on top (table 1).

Table (1): Histopathology of gastric biopsy 6 months postoperative

<i>Histopathology of gastric biopsy</i>		
Normal mucosa/mild gastritis	12	60%
Moderate to severe gastritis	6	30%
Severe gastritis with erosions and metaplasia	2	10%

CLO test was positive in 14 patients out of twenty. 4 of these patients had mild gastritis on preoperative endoscopy with a positive Urease test and received H. Pylori eradication treatment for 2 weeks (fig.4)

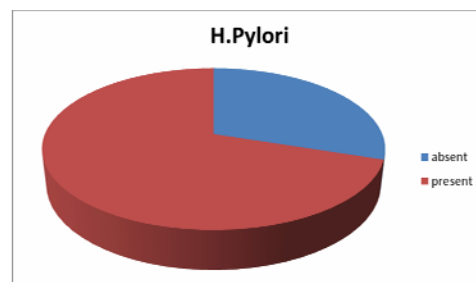


Fig. (4): demographic distribution of H.Pylori

Eight out of these 14 patients with positive H.pylori test in gastric biopsy (57.1%) had normal or mildly inflamed gastric mucosa on histopathological examination of gastric biopsy and the remaining 6 patients (42.9%) had moderate to severe inflammation of gastric mucosa on histopathological examination of gastric biopsy (**fig. 5**). Four out of the remaining 6 patients with negative H.pylori test in gastric biopsy (66.7%) had normal or mildly inflamed gastric mucosa on histopathological examination

of gastric biopsy and the remaining 2 patients (33.3%) out of the six patients with negative H.pylori had moderate to severe inflammation of gastric mucosa on histopathological examination of gastric biopsy (**table 2**)

In our study there was no relationship of statistical significance between results of H.pylori test and the findings of histopathological examination of gastric biopsy with a P value of 1.0

Table (2): H.pylori and findings of histopathological examination of gastric biopsy 6 months postoperative in the studied group

			Gastric biopsy		Total
			Normal & Mild gastritis	Moderate gastritis & Severe gastritis	
H.pylori	Absent	Count	4	2	6
		% within H.pylori	66.7%	33.3%	100.0%
	Present	Count	8	6	14
		% within H.pylori	57.1%	42.9%	100.0%
		% within Gastric biopsy	33.3%	25.0%	30.0%
		% within Gastric biopsy	66.7%	75.0%	70.0%
Total	Count		12	8	20
	% within H.pylori		60.0%	40.0%	100.0%
	% within Gastric biopsy		100.0%	100.0%	100.0%

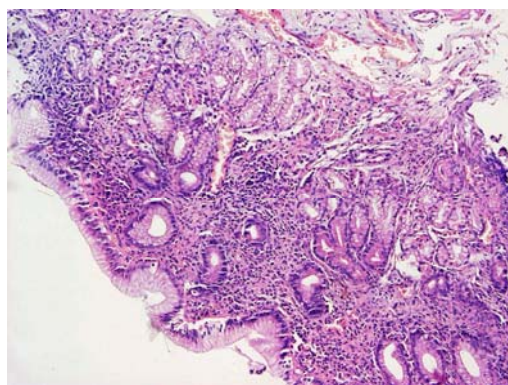


Fig. (5): Gastric mucosa showing moderate infiltration by plasma cells and lymphocytes with few neutrophils (x200 H&E)

DISCUSSION

Mini Gastric Bypass is gaining popularity in some parts of the world especially after the encouraging results published [8]. A randomized controlled trial (RCT) comparing mini gastric

bypass (MGBP) versus Roux-en-Y gastric bypass (RYGBP) concluded that both procedures had comparable results for resolution of metabolic syndrome and improvement of quality of life [9]. laparoscopic mini-gastric bypass (LMGBP) is a simpler and shorter procedure compared to RYGBP. It also has the advantages of less incidence of internal hernia (1 reported case in LMGBP versus 0.9-4.5% in RYGBP) and the ease of reversibility [14].

Musella et al reported in a multicenter review that bile reflux gastritis was symptomatic with endoscopic findings in 0.9% and acid peptic ulcers in 1.7% of patients requiring revision surgery due to biliary gastritis [7]. In a 5-year follow up study of 175 patients, Bruzzi et al. reported that incapacitating biliary reflux developed in 1.6% (2 patients) who required conversion into RYGBP [15]. In another study, Chakhtoura G. et al, reported that out of 100 patients underwent LMGBP 2 patients (2%) complained of biliary reflux [16].

Meanwhile, no relationship between duodenogastric reflux and gastric cancer has been found yet. The question whether the incidence of gastric stump carcinoma is higher than that of gastric carcinoma in general is yet to be answered^[17].

In our study the rate of biliary gastritis was 30 % (6 out of 20 patients). This was proven by upper GI endoscopy and bilirubin level in gastric aspirate and histopathological examination of gastric and esophageal biopsies. This rate is higher than that reported in literature. This may be because of the timing of endoscopy, inclusion of asymptomatic patients, small sample size of our study, but may also be affected by underreporting in other studies, which depended merely on upper GI endoscopy findings.

Hospital stay, morbidity and absence of mortality in our study are comparable to reported international figures. Average EBWL in this study was 74% at 6 month. This is again comparable to the results of Rutledge et al. that reported in 1,054 mini-gastric bypass patients an EBW of 84 % and 91% in the first and second years respectively^[18].

As regards to symptoms, at 6 months, 11 patients had gastro-esophageal reflux disease (GERD) symptoms with an average GSFQ score of 14. However, 4 out these 11 patients didn't have endoscopic findings to explain their symptoms. At the same time, 4 out of 9 asymptomatic patients had endoscopic evidence of esophagitis and gastritis with only 1 of them having microscopic evidence of severe inflammation. The study shows no significant relationship between patients' symptoms and endoscopy findings at 6 month. However, histological findings were more in line with patients' symptoms. This may be due to the fact that pathologists were blinded of patients' symptoms and endoscopy findings.

Despite the fact that 1 out 9 asymptomatic patients had microscopic evidence of severe gastritis and esophagitis, we can't recommend, based on this data, routine endoscopy at 6 month post operatively. Sample size is too small to make such a recommendation, which is not a routine practice internationally.

One would expect change in gastric pH after LMGBP especially with the routine use of PPI postoperatively. According to Hedberg et al., the acidity was significant in the proximal jejunum

after RYGBP even in asymptomatic patients with small gastric pouch^[19]. We haven't found studies looking at gastric pH after MGBP.

H. Pylori can survive the varying acidity of the stomach due to its ability to maintain a tolerable pH in its periplasmic space by acid dependent activation of internal urease activity. Whereas survival of H. Pylori can occur between a pH of 4.0 to 8.0, growth can only occur between a periplasmic pH of 6.0 to 8.0. When urease activity is only able to elevate periplasmic pH to between 4.0 and 6.0, the organisms will survive but not divide.^[20]

In this study, 14 out of 20 patients were H. Pylori positive. This might be due to a change in pH after MGBP. However, preoperative infection can't be excluded as only patients with endoscopic evidence of gastritis were tested for H. Pylori preoperatively. Success of H. Pylori eradication wasn't checked for those who received treatment. H.Pylori prevalence among pre-operative patients, therefore, needs to be further evaluated.

In our study, we managed to standardize the techniques through having single surgical technique and a single endoscopist, along with 100% patients' compliance. Nevertheless, the small sample size, selection bias, different pathologists, short follow up period, are all obvious drawbacks.

This study highlighted the safety of MGBP in our Hospital setting. No mortality, low morbidity with quick postoperative recovery. Incidence of biliary gastritis was 6/20 (30%).

CONCLUSION

The rate of biliary gastritis post LMGBP needs to be further studied in a larger population with larger follow up period to be able to assess its true incidence. No relationship of statistical significance was found between results of H.pylori test and the findings of histopathological examination. However, increased incidence of H. Pylori infection post LMGBP needs to be further studied.

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