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RESEARCH ARTICLE

Can Pre-Operative Endoscopy Identify Patients at Risk for Gastroesophageal Reflux Disease after Sleeve Gastrectomy?

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Abstract

Background: Obese individuals have higher incidence of hiatal hernia (HH). There is controversy over the need for preoperative esophagogastroduodenoscopy (EGD) before bariatric procedures. The aim of this study is to determine the predictive value of preoperative endoscopy in diagnosing HH.

Methods: Under IRB Approval A retrospective review of 402 cases who underwent sleeve gastrectomy (SG) in our academic center between January 2011 and December 2015 was performed. Patients who had preoperative EGD reports were enrolled in the study. Data were collected for the demographics, preoperative endoscopic and intraoperative findings. Each patient's EGD findings were compared with the intraoperative findings.

Results: From total of 402 SG cases, 381 (81% female) had preoperative EGD. The mean age of the subjects was 45.8 years (± 10.6 years) with the mean BMI of 47.5 kg/m^2 (± 8.8 kg/m^2). There was no significant difference in age and BMI between males and females. 80 cases (20.5%) had a preoperative EGD that showed HH and 39 of those (48.7%) had intraoperative findings consistent with HH. 301 (79%) patients had no HH on preoperative EGD, out of which 286 (95%) patients were also negative for HH intraoperatively. Compared with intraoperative diagnosis, EGD had sensitivity of 67% and specificity of 85%. The negative predictive value of EGD was 96% for HH but the positive predictive value was 34%.

Conclusions: EGD is a valuable informative tool in preoperative evaluation of bariatric patients. Our study demonstrated that EGD has high negative predictive value in ruling out HH but also with relatively low positive predictive value to prove its presence. Further studies are warranted to evaluate the discrepancies between the preoperative and intraoperative identification of HH, and standardization of definition for theses finding.

Keywords

Bariatric surgery, Hiatal hernia, Sleeve gastrectomy, Esophagogastroduodenoscopy (EGD), Predictive value

Introduction

Obesity is a multinational public health burden as obesity has doubled since 1980 with 1.5 billion adults gone into obesity in 2008. In the United States, 34 percent of US adults 20-years-old and older are overweight, 34% obese, and 6% are Morbid obese [1]. Obesity is precisely linked to diabetes, hypertension and other chronic disease increase risk, Making big load on public health.

Preoperative upper gastrointestinal endoscopy (EGD) in patients going through bariatric surgery is argumentative [2]. It is supported routinely by some au-

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thors to identify benign and cancerous pathology that largely leftovers without symptoms [2]. Others [3] advocate selective use, implying not much alter on surgical management of detected pathology, particularly in asymptomatic patients [4].

On the other hand, as (EGD) is an invasive procedure, other studies advocate that in preoperative assessment before bariatric surgery may be stand on the presence or absence of symptoms [5].

Nonetheless, many other studies [2] routinely performing EGD in preoperative bariatric surgery demonstrated that there is no correlation between manifestations and pathological findings on EGD. A variety of pathologies, including HH, esophagitis, gastritis, duodenitis, peptic ulcers, etc., can be determine on EGD [4]. Routine (EGD) preoperatively has not been constantly presented to change the management [1]. However, these endoscopic procedures contribute considerably to healthcare cost that may be avoided with selection and identification [6]. The purpose of this study is to determine the value of preoperative endoscopy for bariatric surgery as a routine practice.

Material and Methods

Under IRB approval A retrospective review of 402 cases who underwent sleeve gastrectomy (SG) in our academic center between January 2011 and December 2015 was performed. We included all patients who had preoperative EDG. Twenty-one patients of revisional surgery after initial SG were excluded. We reviewed the EGD and operative reports for existence of hiatal hernia findings. Each patient's preoperative EGD findings were compared with the intraoperative ones. We defined the

Table 1: Patients with HH by EGD (total no = 381).

Patients without HH		Patient with HH	
No	**%**	**No**	**%**
301	79%	80	21%

HH: Hiatal Hernia.

Table 3: HH repair (total no = 381).

Patients without repair		Patient with repair	
No	**%**	**No**	**%**
286	75%	31	25%

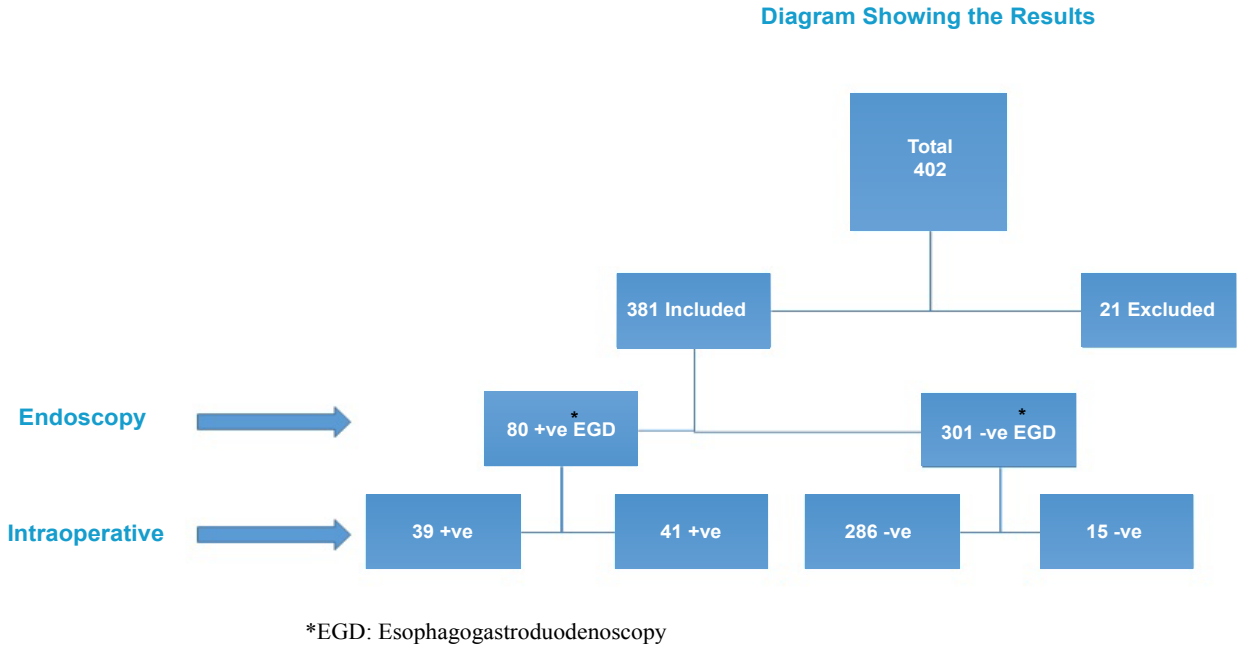
Table 4: Relation between endoscopic results and operative repair (total = 375).

Endoscopic results	Operative repair				X^2	P values
	Without repair		With repair		57.9	< 0.001
	No	%	No	%		
No HH	286	85.1	15	33.3		
HH	41	14.9	39	66.7		
Total	327	100	54	100		

Table 2: PPV & NPV.

	Sensitivity (95% CI)	Specificity (95% CI)	PPV (95% CI)	NPV (95% CI)	True positives	False positives	False negatives	True negatives
	%	%	%	%	NO.	NO.	NO.	NO.
Endoscopy	67% (50%-80%)	85% (81%-89%)	34% (24%-46%)	96% (92%-98%)	39	15	41	286

PPV: Positive Predictive Value; NPV: Negative Predictive Value.



*EGD: Esophagogastroduodenoscopy

Figure 1: Flow Chart of the Results.

Table 5: Other EGD Findings.

Findings:	No.	%
1- Barret Esophagus & HH	5	1.24%
2- Severe gastritis & HH	11	2.73%
3- Nodule in Duodenum	1	0.24%
4- Gastric Nodules	2	0.49%
5- Recurrent HH & Gastric fistula	1	0.24%

hiatal hernia by the EGD as a more than 2 cm separation of the caudally displaced esophago-gastric junction and diaphragmatic crural impression [7].

Statistical Analysis

Statistical presentation and analysis of the present study was conducted with SPSS V.18. and Data was expressed using X*2 (Chi 2),* Epi Cal 2000.

Results

From total of 402 SG cases, 381 (81% female) had preoperative EGD. The mean age of the subjects was 45.8 years (± 10.6 years) with the mean BMI of 47.5 kg/m^2 (± 8.8 kg/m^2). There was no significant difference in age and BMI between males and females. 80 cases (20.5%) had a preoperative EGD that showed HH and 39 of those (48.7%) had intraoperative findings consistent with HH Table 1. 301 (79%) patients had no HH on preoperative EGD, out of which 286 (95%) patients were also negative for HH intraoperatively. Compared with intraoperative diagnosis, EGD had sensitivity of 67% (± 7%) and specificity of 85% (± 2%) Table 2. The negative predictive value of EGD was 96% (± 2%) for HH but the positive predictive value was 34% (± 5%) (Table 3 and Table 4) (Figure 1).

Discussion

Our study demonstrated that EGD has high negative predictive value in ruling out HH but also with relatively low positive predictive value to prove its presence.

As we already mentioned that (HH) and GERD is closely associated with morbid obesity. Also Sleeve gastrectomy can Lead to post-operative GERD symptoms [8].

In our practice we did not depend on the symptoms for the preoperative (EGD) we standardize it for all our patients, Zeni TM, et al. [9] and in Kuper MA, et al. [10] noticed that a high percentage of morbidly obese asymptomatic patients had positive findings During the screening. Only 12 of 69 patients (17.4%) had expressed upper gastrointestinal symptoms before the procedure. On the other hand, Heacock L, et al. (2012) [4] demonstrate that routine (EGD) produce a lot of endoscopic variations. In some cases, findings bring on a change in surgical management. But in most of the cases they did not make any change, Table 5 [11]. Furthermore, important endoscopic findings are common among obese patients which may alter the surgical plan or even abort it. While some authors founded the negative predictive value in low-risk patients was not sufficient, finally they recommend routine (EGD) for all patients Lee J, et al. [8].

Per De Palma, G. D. and P. Forestieri [12]. They mentioned that in some selective procedures changes may be done if meaningful upper GI findings present, like large HH or Barrett's esophagus, and was detected preoperatively by EGD. The published guidelines of the European Association for Endoscopic Surgery state that esophagogastroduodenoscopy (EGD), or upper-GI series, is advisable for all bariatric procedures. Similarly, the recently published guidelines from the ASGE recommended that EGDS should be performed in all symptomatic patients undergoing bariatric surgery. A shortage of interconnection between patient manifestations and EGD Finding has been discussed by many studies, implying that routine preoperative endoscopy can be useful in HH diagnosis [12]. Although, putting in consideration the relatively less important finding in the majority of lesions discovered on routine EGDS, cost and the amount of secondary irrelevant workup, several studies have instead suggested a non-endoscopic approach for patients without symptoms [12].

One of the major burden of performing routine preoperative upper endoscopy is the hazard of sedation. Cardiopulmonary complications are the worst complications accompanying the sedation during the procedure, with a mortality rate of 0.03% and a serious morbidity rate of 0.54% [13]. In morbidly obese patients, the complications will be even higher because the possibility of restrictive lung disease, obstructive sleep apnea, pulmonary hypertension, and cardiac diseases. It is of cardinal importance that procedures in obese patients are done in a fully supplied setting and by a strong-organized team endoscopiests and anesthesiologists Sharma, et al. [14]. However, finding, a single cancer may not be cost effective, there are obvious benefits to that one patient, also strict to a medico-legal standard of care InMong C, et al. [15].

On the other hand, Barium studies and other contrast imaging may be another option for diagnose HH, however, the advantages of the EGD goes higher the diagnosis only but the confirmation of the pathology and findings by biopsy is achievable. Furthermore, the finding during the operation still has the most accurate evidence. In the study of Broucek JR, et al. [16] showed that UGI series have poor positive and negative predictive values in preoperatively diagnosing HH. Also, patient symptoms were different subjectively and anti-reflux medication did not match with radiologic or intraoperative findings of HH [17]. Standardizing routine preoperative EGD before bariatric surgery Still a topic for arguments. Although small HH are over estimated with EGD, and Endoscopiest experiences also has a big role Mohammed R, et al. [18]. However, due to high negative predictive value of the EGD in ruling out hiatal hernia, we can avoid hiatal dissection in these patients who did not have evidence of HH on the Preoperative EGD.

Conclusions

EGD is a valuable informative tool in preoperative evaluation of bariatric patients. Our study demonstrated that EGD has high negative predictive value in ruling out HH but relatively low positive predictive value to prove its presence. Further studies are warranted to evaluate the discrepancies between the Preoperative and intraoperative identification of HH and standardization of definition of operative finding of hiatal hernia in this group of patients undergoing sleeve gastrectomy.

Conflict of Interest

The authors declare that they have no conflict of interest.

Ethical Statement

All procedures involving human participants were performed 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 was obtained from all individual participants included in the study.

Authors have no pertinent disclosures.

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