

Is Elective Gastroscopy Prior to Bariatric Surgery in an Asian Cohort Worthwhile?

Jing Yu Ng¹ · Anton K. S. Cheng² · Guowei Kim¹ · Lucy W. C. Kong³ ·
Khin T. Soe⁴ · Davide Lomanto¹ · Jimmy B. Y. So¹ · Asim Shabbir¹

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Abstract

Background The preoperative use of gastroscopy for patients undergoing bariatric surgery remains controversial. We aim to evaluate the diagnostic yield of gastroscopy and the clinical significance in asymptomatic individuals undergoing bariatric surgery in Asia.

Methods We retrospectively reviewed the medical records of all patients undergoing gastroscopy prior to bariatric surgery

at the National University Hospital and Khoo Teck Puat Hospital, Singapore, between Jan 2006 and June 2013. Gastroscopy findings were classified into four groups: group 1 (normal study), group 2 (abnormal findings that do not modify surgical approach), group 3 (abnormal findings that modify surgical approach) and group 4 (absolute contraindications to immediate surgery).

Results During the study period, 208 asymptomatic individuals were evaluated by gastroscopy prior to bariatric surgery. Gastroscopy was normal in 70 (33.6 %). Group 2 comprised 67 (32.2 %) patients with mild gastritis or oesophagitis. Group 3 included 69 (33.2 %) patients diagnosed with erosive gastritis or oesophagitis, peptic ulcer disease, hiatal hernia or mass lesions. There were 2 patients (1.0 %) in group 4. One patient had a gastro-oesophageal junction adenocarcinoma, and 1 had a gastrointestinal stroma tumour. In group 3, modification of surgical approach included concurrent hiatal hernia repair, institution of medical therapy with delay in surgery, further evaluation of mass lesions and change in choice of surgical procedures.

Conclusions Routine gastroscopy for asymptomatic bariatric patients has a high diagnostic yield. Given the high percentage of patients with clinically important lesions, our current experience supports the use of routine preoperative gastroscopy prior to bariatric surgery in Singapore.

✉ Asim Shabbir
cfsasim@nus.edu.sg

Jing Yu Ng
jing_yu_ng@nuhs.edu.sg

Anton K. S. Cheng
antoncheng@gmail.com

Guowei Kim
guo_wei_kim@nuhs.edu.sg

Lucy W. C. Kong
kong.lucy.wc@alexandrahealth.com.sg

Khin T. Soe
surkts@nus.edu.sg

Davide Lomanto
davide_lomanto@nuhs.edu.sg

Jimmy B. Y. So
jimmy_so@nuhs.edu.sg

Keywords Gastroscopy · Bariatric surgery · Asian

Introduction

Obesity is a global epidemic and is associated with concomitant diseases, such as diabetes mellitus, coronary heart disease, obstructive sleep apnoea and gastro-oesophageal reflux disease (GERD) [1, 2]. Morbidly obese individuals in addition

¹ University Surgical Cluster, National University Health System, Level 8 NUHS Tower Block, 1E Kent Ridge Road, Singapore 119228, Singapore

² Department of General Surgery, Khoo Teck Puat Hospital, Yishun, Singapore

³ Alexandra Health Services, Yishun, Singapore

⁴ National University of Singapore, Singapore, Singapore

have decreased life expectancy [3]. In Singapore, it is estimated that more than 10.8 % of the population have a BMI > 30 kg/m² [4].

Non-surgical options for treatment of morbid obesity include lifestyle modifications and use of medications. Patients may lose weight initially but find it hard to maintain weight loss [5]. Surgical options are often considered for morbidly obese patients who have been unable to achieve weight loss via non-surgical approaches.

There is, however, no standardized diagnostic workup for the upper gastrointestinal (GI) tract in obese patients. Current guidelines state that upper gastrointestinal evaluation is recommended for all bariatric procedures, although the level of evidence supporting this recommendation is rather weak [6]. In Singapore, gastroscopy is now considered an obligatory preoperative investigation across many bariatric centres.

Our study aims to evaluate the diagnostic yield and report the most common gastroscopy findings and their clinical significance in asymptomatic individuals undergoing bariatric surgery in Singapore.

Methodology

A retrospective review of all patients who underwent gastroscopy prior to bariatric surgery between January 2006 and June 2013 were identified from a prospectively recorded bariatric database across two tertiary health institutes, National University Hospital and Khoo Teck Puat Hospital, Singapore. All patients were enrolled in a multidisciplinary bariatric program which included dietary intervention, physiotherapy and psychologic assessment. Patients underwent one of three laparoscopic procedures: adjustable gastric banding (LAGB), gastric bypass or sleeve gastrectomy.

Data were collated by reviewing electronic and written medical records using a standard data collection sheet. Preoperative data collected included age, gender, ethnicity, BMI, the presence of upper GI symptoms, gastroscopy findings and subsequent management plans. Patients with upper GI symptoms were excluded from the study.

The gastroscopy findings were all reviewed by experienced endoscopists. These endoscopic findings were categorized into either of the four groups illustrated in Table 1. The criteria for the groups were determined by the attending surgeons: Group 1 included patients who had normal gastroscopies. Group 2 was made up of patients who had abnormal findings which did not significantly impact either the surgical approach or the timing of surgery. Findings in this group included mild oesophagitis or gastritis. Groups 3 and 4 included clinically important lesions. Group 3 consisted of patients who had findings requiring a change in surgical management or additional investigations or therapy prior to surgery. Lesions categorised here included mass lesions (submucosal), peptic ulcers,

Table 1 Classification system for gastroscopy finding

Group 1: nil findings
Normal study
Group 2: abnormal findings (nil change in surgical approach/postpone surgery)
Mild oesophagitis, gastritis
Group 3: abnormal findings (change in surgical approach/postpone surgery)
Mass lesions (submucosal)
Peptic ulcers
Erosive oesophagitis, gastritis
Hiatus hernia
Group 4: absolute contraindication to surgery
Upper GI cancer

erosive oesophagitis or gastritis and hiatal hernias. Group 4 included patients with absolute contraindications to surgery. This was made up of patients who had newly diagnosed upper gastrointestinal cancer. In instances where there was more than one abnormal gastroscopy finding, the more clinically significant one was considered the primary diagnosis.

Results

During the study period, a total of 262 patients underwent gastroscopy prior to bariatric surgery across both institutes. Excluded were 54 patients with documented gastrointestinal symptoms, and the remaining 208 patients formed the study group. Majority of the patients underwent sleeve gastrectomy as seen in Fig. 1. Patient demographics are shown in Table 2. Most of the patients were females with a median age of 40 years and a mean BMI of 42.2 kg/m². Chinese are the majority ethnic group in this study population.

One or more lesions were identified in 138 (66.3 %) patients with 71 (34.1 %) having clinically important findings which required management as detailed in Table 3. Figure 2 shows the distribution of findings on gastroscopy, with

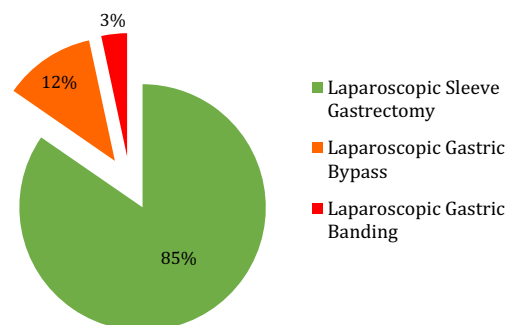


Fig. 1 Distribution of bariatric surgery performed ($n = 208$)

Table 2 Patient demographics ($n=208$)

Age (years)	
Median age (range)	40 (19–68)
Gender (%)	
Male	94 (45.2)
Female	114 (55.0)
Ethnicity (%)	
Chinese	75 (36.1)
Malay	58 (27.9)
Indian	52 (25.0)
Others	23 (11.1)
BMI (kg/m^2) ^a	42.2 (± 7.1)

Values are mean \pm SD

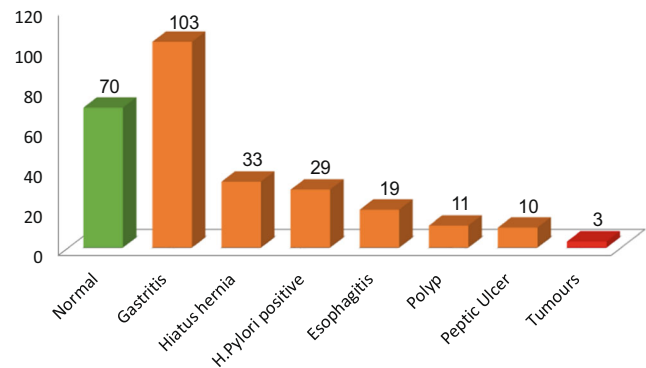
gastritis (49.5 %, $n=103$) being the most common pathology. Twenty-nine (13.9 %) patients were found to have *Helicobacter pylori* infection.

Tumours were picked up in three (1.4 %) patients, an adenocarcinoma and two submucosal tumours. The patient with adenocarcinoma underwent endoscopic submucosal dissection with a surveillance gastroscopy before his subsequent bariatric surgery. The two patients with submucosal lesions had preoperative endoscopic ultrasound performed before concurrent tumour resection with sleeve gastrectomy. Histology was consistent with leiomyoma and malignant gastrointestinal stroma tumour (GIST). The patient with leiomyoma was classified as group 3 (clinically significant lesions which required a delay/modification of surgery). The two patients with malignant tumours were included in group 4 (contraindications to surgery).

Based on our grouping system, group 1 had 70 (33.7 %) patients, group 2 had 67 (32.2 %) patients,

Table 3 Clinically important lesions diagnosed by gastroscopy and their management

Lesion	Incidence	Management
Hiatal hernia	33 (15.9 %)	Crural repair Reduction of hernia
Gastritis (erosive)	10 (4.8 %)	Medical treatment Postpone surgery
Oesophagitis (erosive)	4 (1.9 %)	Medical treatment Postpone surgery
Peptic ulcer disease	10 (4.8 %)	Biopsy and repeat scope Modification of surgery
Mass lesions (e.g. polyps)	12 (5.8 %)	Further investigation
Gastrointestinal stroma tumour	1 (0.5 %)	Further investigation and concurrent surgical resection
Upper GI cancer	1 (0.5 %)	Endoscopic submucosal dissection

**Fig. 2** Findings of gastroscopy ($n=208$)

group 3 had 69 (33.2 %) patients and group 4 had 2 (1.0 %) patients. All 208 patients underwent subsequent laparoscopic bariatric surgery.

In general, patients with erosive gastritis and oesophagitis or peptic ulcer disease were treated for 4–6 weeks with proton pump inhibitors and triple therapy if they tested positive for *H. pylori*. Severe cases had a repeat gastroscopy and underwent subsequent bariatric surgery if there was an improvement. Modification of planned bariatric surgery was also done (gastric bypass to sleeve gastrectomy) for one patient as there was a need for interval endoscopic surveillance for peptic ulcer disease. Hiatal hernias > 2 cm were explored intraoperatively, and two patients had concurrent crural repairs performed.

Discussion

Given the high percentage of patients with clinically significant lesions, our data demonstrate the benefit of routine gastroscopy in patients prior to bariatric surgery. We picked up two patients with absolute contraindications to surgery. There was also a substantial group of patients who had endoscopy findings requiring modification to surgical approach or timing. Because of the high incidence of pathology detected in this otherwise asymptomatic group of patients, we believe a baseline documentation of upper GI condition is important if future GI symptoms develop.

The role of gastroscopy in obese patients prior to bariatric surgery is controversial. The main reason for the routine use of upper endoscopy is the possible presence of upper gastrointestinal pathology which may influence treatment plans for patients. Frigg et al. advocated routine gastroscopy prior to bariatric surgery because of the high prevalence of upper gastrointestinal lesions [7]. Sharaf et al. further demonstrated clinically important findings in 61.5 % of patients having routine preoperative gastroscopy [8]. Munoz et al. had one of the largest series (626 patients) studied prior to bariatric surgery and found abnormalities in 46 % of patients including early gastric cancer [9].

H. pylori infectivity for instance has a clear correlation with peptic ulcer disease and is associated with a twofold increased risk of gastric cancer [10–12]. Peptic ulcer disease is also widely regarded as a relative contraindication for bypass procedures as future endoscopic access is denied. In addition, the relative incidence of proximal gastric cancer in Singapore has been steadily increasing during the last few decades without a corresponding reduction in gastric cancer overall [13].

There are, of course, further modalities of evaluating the upper gastrointestinal tract. Barium meal is a commonly accepted alternative with low reported complication rates [14]. However, there is considerable evidence that endoscopy has a far better diagnostic accuracy and hence, a better clinical efficacy. In addition, many patients with an upper gastrointestinal series also subsequently have endoscopy. Patients who have endoscopy as their primary procedure on the other hand seldom require further radiological study. As a result, it appears that from a systemic point of view, there is nil significant cost differential between endoscopy and barium study [15]. Gastroscopy, thus, remains the investigation tool of choice for the upper gastrointestinal tract.

We also know from practical experiences that abnormal gastroscopy findings do not always influence subsequent surgical plans. This correlates with medical literature where studies report a high incidence of abnormal upper endoscopy findings; however, these findings are often not clinically relevant. Azagury et al. found abnormal findings in 47 % of their patients but did not advocate routine endoscopy screening due to weak clinical relevance [16].

There is yet a further controversy concerning the management of these gastroscopy findings [17, 18]. Some surgeons believe that conditions such as hiatal hernia and gastro-oesophageal reflux are natural consequences of obesity and they will disappear naturally with weight reduction after a successful bariatric surgery. Others believe that these conditions are vital aspects of obesity management, which has significant implications for the selection of subsequent surgical procedure.

In our institutions, we consider erosive gastritis or oesophagitis, benign or malignant tumours and ulcer disease to be clinically significant. Hiatal hernias are correlated with the presence of upper gastrointestinal symptoms and explored intraoperatively before a decision is made for crural repair. This is vital as a subsequent sleeve gastrectomy performed may result in or aggravate pre-existing reflux symptoms for the patient [19]. In our experience however, crural repair was deemed to be sufficient and none of the patients had a modification of surgery to a gastric bypass.

We recognize the limitations of our study. Randomization of patients was not possible with the retrospective design of our study. We, however, included all patients to reduce the risk of bias. The relatively low sample size can also be explained by the slow take-off of bariatric surgery in Asia over the last

few years. The incidence of obesity in Asia is not high in comparison to those in Europe and America. The prevalence of obesity in Singapore, although on the rise, is still not very high, and bariatric surgery has only recently been introduced in a big way here. Hence, most of the patients included in the study were operated from 2010 onwards. We further excluded patients with documented gastrointestinal symptoms from the study.

This present study illustrates that gastroscopy prior to bariatric surgery in asymptomatic Asian patients has a high diagnostic yield. None of the patients in the study developed any gastroscopy or sedation-related complications. Routine gastroscopy thus represents a reasonably safe investigation modality with a high clinically significant lesion pickup rate [20]. We advocate routine preoperative gastroscopy for asymptomatic patients undergoing bariatric surgery. Well-designed prospective studies to further evaluate the utility of routine gastroscopy prior to bariatric surgery are warranted to make better clinical practice guidelines for Asia.

Compliance with Ethical Standards All procedures performed in studies involving human participants were 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. This study was approved by the Research Ethics Committee of the National University Hospital.

For this type of study, formal consent is not required.

Conflict of Interest The authors declare that they have no conflicts of interest.

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