

INDICATORS AND PREDICTORS OF POSTOPERATIVE OESOPHAGOGASTRODUODENOSCOPY AFTER BARIATRIC SURGERY – ANALYSIS FROM A TERTIARY BARIATRIC CENTRE

Mr. Mohammed Al-Rashedy, Mr. Anirban Ghosh,
Ms Sylvia Krivan, Mr. Omer Al-Ta'an,
Mr Aruna Munasinghe,

Corresponding author

Mr. Aruna Munasinghe
Consultant Upper GI and Bariatric Surgeon
Luton and Dunstable Hospital
Email: aruna@doctors.org.uk

DOI : <https://doi.org/10.52338/wjsurg.2022.1015>

Received Date: July 22 2022

Accepted Date: July 24 2022

Published Date: August 12 2022

Abstract

Background:

Following bariatric surgery, patients can develop foregut symptoms like dysphagia, reflux, or pain due to stomal ulceration. Oesophagogastroduodenoscopy (OGD) is a diagnostic modality of choice to evaluate these symptoms on most occasions. The objective of this study was to assess the indications and predictors of performing an OGD after bariatric surgery and the treatment offered.

Method:

Patients who had an OGD after a bariatric procedure over one year period were identified, followed up for two years and the indications, findings and treatment offered were studied. A regression model was used to evaluate the predictors of post-operative OGD.

Results:

488 patients underwent bariatric surgery during the 12-month study period. 278 patients had Roux en-Y Gastric Bypass (RYGB) and 202 had Sleeve Gastrectomy (SG). In total, 52 had a postoperative OGD (10.8%). 26 (9.4%) were following RYGB and the other 26 (12.8%) were after SG. Indications for postoperative OGD were dysphagia (44.2%), nausea/vomiting (32%), acid Reflux (19.5%), upper abdominal pain (15.3%) and odynophagia (13%). 22 (42.3%) OGDs were normal, 11 (21%) showed reflux oesophagitis, 7 (13.5%) showed gastritis, 8 (15.3%) showed a

small hiatus hernia and 2 (3.8%) patients had a stricture. 47 (90%) were managed medically and two underwent balloon dilatation. No complications were recorded after any of the OGD procedures.

Conclusion:

Post-operative OGD's took place in around 11% of patients undergoing primary bariatric surgery. There were no specific predictors of which patients required endoscopy, and the majority had normal findings. This study does not support routine OGD following bariatric surgery. However, future studies in both symptomatic and asymptomatic patients over a longer follow up period would allow us a deeper understanding of the need for routine long-term surveillance of patients following metabolic surgery,

Keyword

Bariatric Surgery, Upper GI Endoscopy, Gastric bypass, Sleeve gastrectomy, Reflux, Abdominal pain.

INTRODUCTION

The obesity epidemic in the United Kingdom has resulted in a rise in the number of bariatric surgical procedures that are performed each year (1). Bariatric surgery, including both gastric bypass (RYGB) and sleeve gastrectomy (SG), are shown to be effective in reducing body mass index (BMI) and obesity-related comorbidities (2). Bariatric surgery is generally very safe, and the risks of bariatric surgery continue to decrease with developing expertise (3). However, some patients develop post-operative symptoms that need investigation. Clinicians looking after bariatric patients need to be aware of such signs and symptoms and be able to plan the correct management.

In patients presenting with foregut symptoms after bariatric surgery, complications are usually suspected. Patients can present to their general practitioner, weight loss clinic or even to the Emergency Department. Such symptoms often require further investigations, with oesophagogastroduodenoscopy (OGD) being a very important tool (4). Symptoms may range from mild nausea to severe abdominal pain or vomiting. As a result of this wide range of possible presenting symptoms, it is important for doctors across multiple specialities to be aware of how to identify any complications.

World Journal of Clinical Surgery (ISSN 2766-6182)

There is a large variability in the use of OGD in bariatric patients in the pre- or post-operative settings. This variation may be accounted for by differences in healthcare systems, local policies, insurance coverage, local disease prevalence, as well as individual surgeon preference. The International Federation for the Surgery of Obesity and Metabolic Disorders (IFSO) released a position statement in 2020 on the use of routine pre-operative OGD in patients which was to be limited to the patients with upper GI symptoms (5). However, in SG patients we have seen that the presence of oesophagitis or Barrett's oesophagus has a poor correlation to symptoms. With the growth in popularity of the one anastomosis gastric bypass (OAGB), it is a procedure that is not recommended in those with Barrett's oesophagus which may only be detected with routine pre-operative OGD. The IFSO statement recommends routine post operative OGD following SG and OAGB, but for RYGB only based on upper GI symptoms (6).

Nevertheless, there remains little published evidence on which patients would require an OGD after RYGB and SG. There is emerging evidence to support the use of OGD in all patients with a history of bariatric surgery, whether symptomatic or not. This study aims to explore the indications for OGD after bariatric surgery as well as identify any predictors for its need after surgery.

METHODS

This study was conducted in a tertiary bariatric centre that provides a regional specialist referral service. Analysis was undertaken of all the patients who underwent primary bariatric surgery over one year period and followed up for two years. The operative techniques were standardized across the 5 Bariatric surgeons in the hospital. Any patients with a known hiatus hernia, or one that was detected intraoperatively, had concomitant crural repair at the time of bariatric surgery.

Data were collected from a prospectively-maintained database and included patient age, gender, BMI and obesity-related comorbidities. Patient records were then searched to identify those that underwent elective or emergency OGD within 2 years of primary bariatric surgery. It was also noted whether patients had a known history of hiatal hernia or gastroesophageal reflux disease.

The data were verified individually and tabulated in Microsoft Excel©. Statistical analysis was performed using multivariate regression analysis with SPSS version 26 (SPSS, Chicago, IL).

RESULTS

Descriptive Statistics

480 patients underwent bariatric surgery in this centre over

one year period. The distribution of obesity-related diseases amongst these patients is given in [table 1](#).

Table 1: Distribution of obesity-related comorbidities in patients who underwent bariatric surgery in one year period.

Comorbidities	Number of patients / Percentage %
Diabetes	159 (33.1%)
Hypertension	196 (49%)
Dyslipidaemia	99 (20.6%)
Arthritis	142 (29.5%)
Obstructive Sleep Apnoea	159 (33.1%)
Obstructive Sleep Apnoea on CPAP	122 (25.4%)

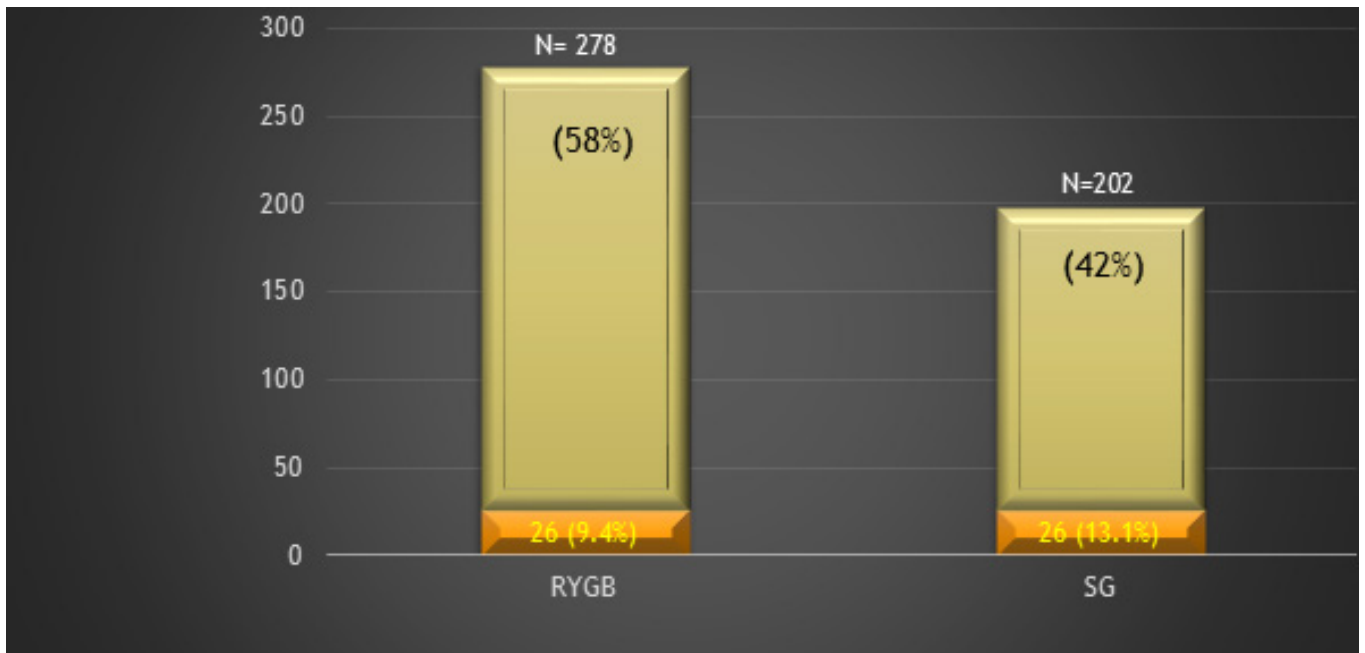
The comorbidities of patients who underwent OGD are shown in [table 2](#).

Table 2: Distribution of obesity-related comorbidities in patients who underwent OGD within two years of bariatric surgery

Comorbidities	Number of patients and percentage %
Diabetes	16 (30.7%)
Hypertension	19 (36.5%)
Dyslipidaemia	8 (15.3%)
Arthritis	24 (46.1%)
Obstructive Sleep Apnoea	17 (32.6%)
Obstructive Sleep Apnoea on Continuous Positive Airways Pressure (CPAP) Treatment	15 (29%)

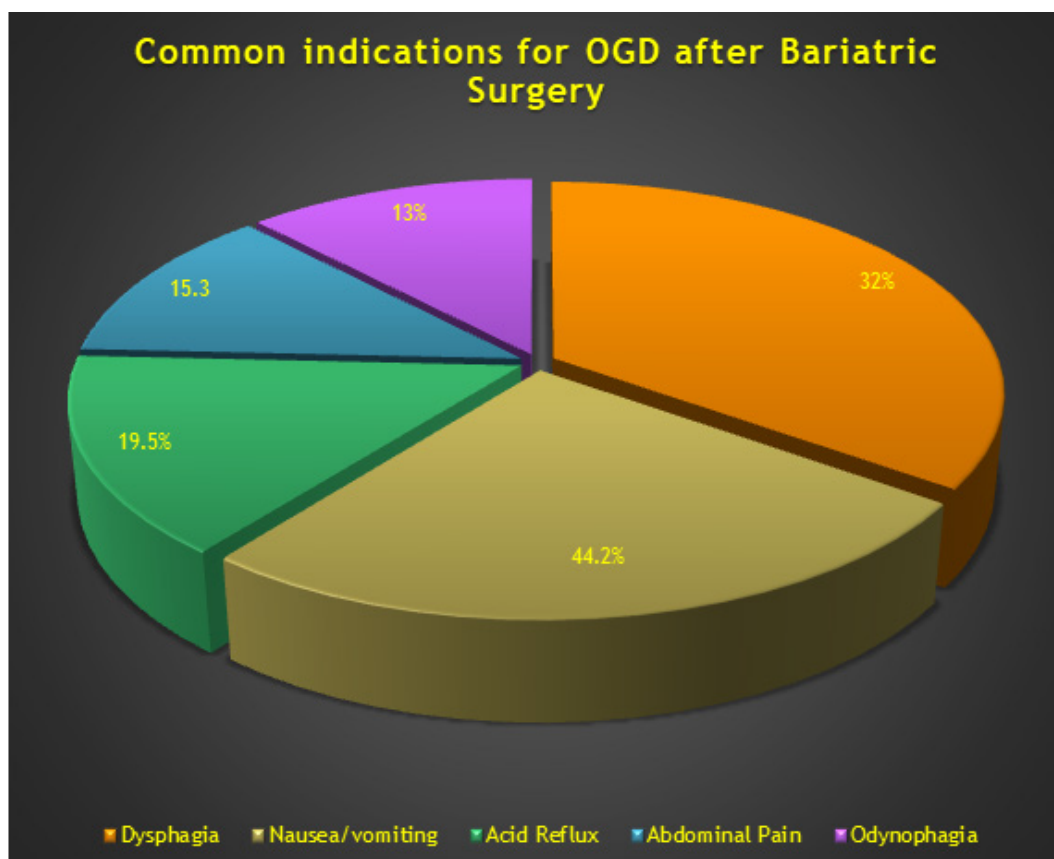
52 of the 488 (10.8%) patients had a postoperative OGD within 2 years of surgery. The median patient age was 48 years (range 22-77, IQR 13), Male: female ratio was 1:3, and the BMI range was 33-70. 26 patients (9.4%) had previously undergone RYGB and the other 26 (13.1%) had SG.

Figure 1: Proportion of patients undergoing RYGB or SG in 2017 who underwent OGD within 2 years of surgery



A higher percentage of SG patients needed postoperative OGD (13.1% in comparison to 9.4% of RYGB), but this did not reach statistical significance ($p=0.6$). There were multiple indications for postoperative OGD identified in this study. The commonest indication was nausea/vomiting, followed by dysphagia, odynophagia and reflux. Other indications included excessive weight loss, and for the assessment or diagnosis of suspected leaks.

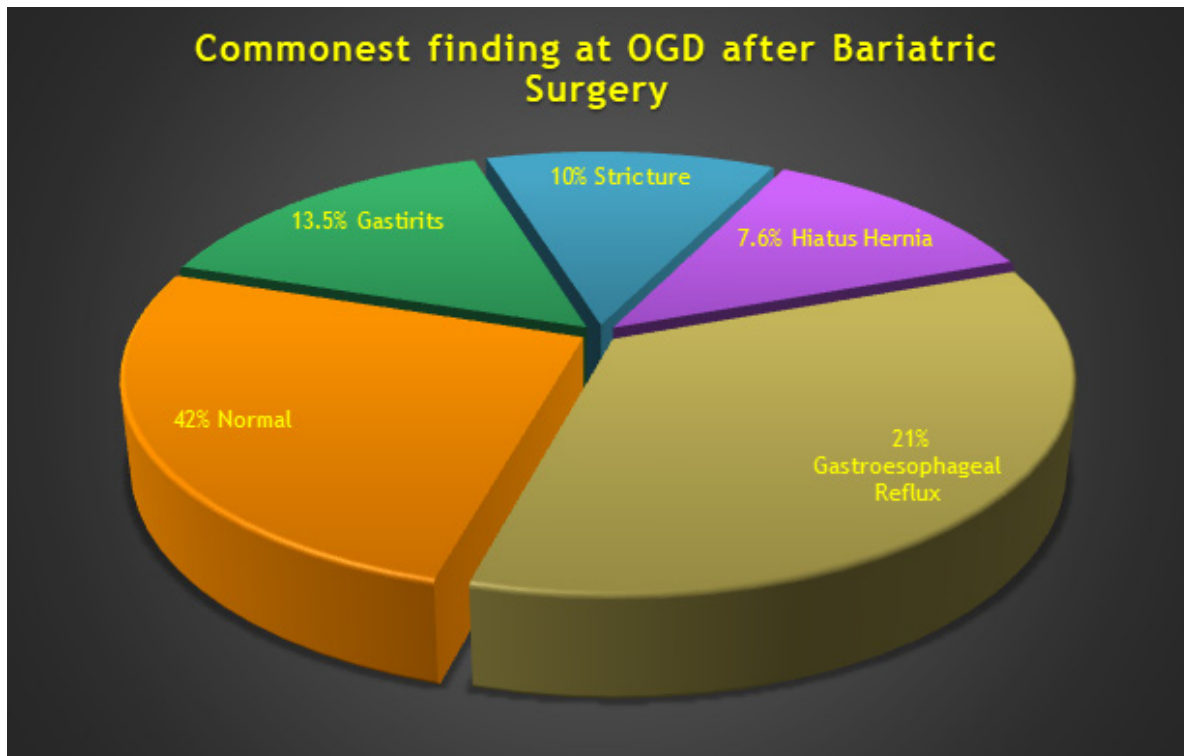
Figure 2: Indications for post-operative OGD within two years of primary bariatric surgery



World Journal of Clinical Surgery (ISSN 2766-6182)

Twenty-two patients (42%) had no abnormality at OGD. The rest of the OGD findings among our patients showed 11 patients (21%) with gastro-oesophageal reflux, 7 (13%) with gastritis, 5 patients (10%) with a stricture, 4 (7.6%) patients with a small recurrence of a hiatus hernia with reflux after concomitant repair, 3 (6%) had ulceration at the staple line, and 5 patients (10%) had other findings.

Figure 3: Commonest post-operative finding at OGD after Bariatric Surgery



No patients developed any complication following OGD. Figures 4 and 5 illustrate the indications for gastroscopy by index procedure.

Figure 4: Indication for OGD after Sleeve Gastrectomy

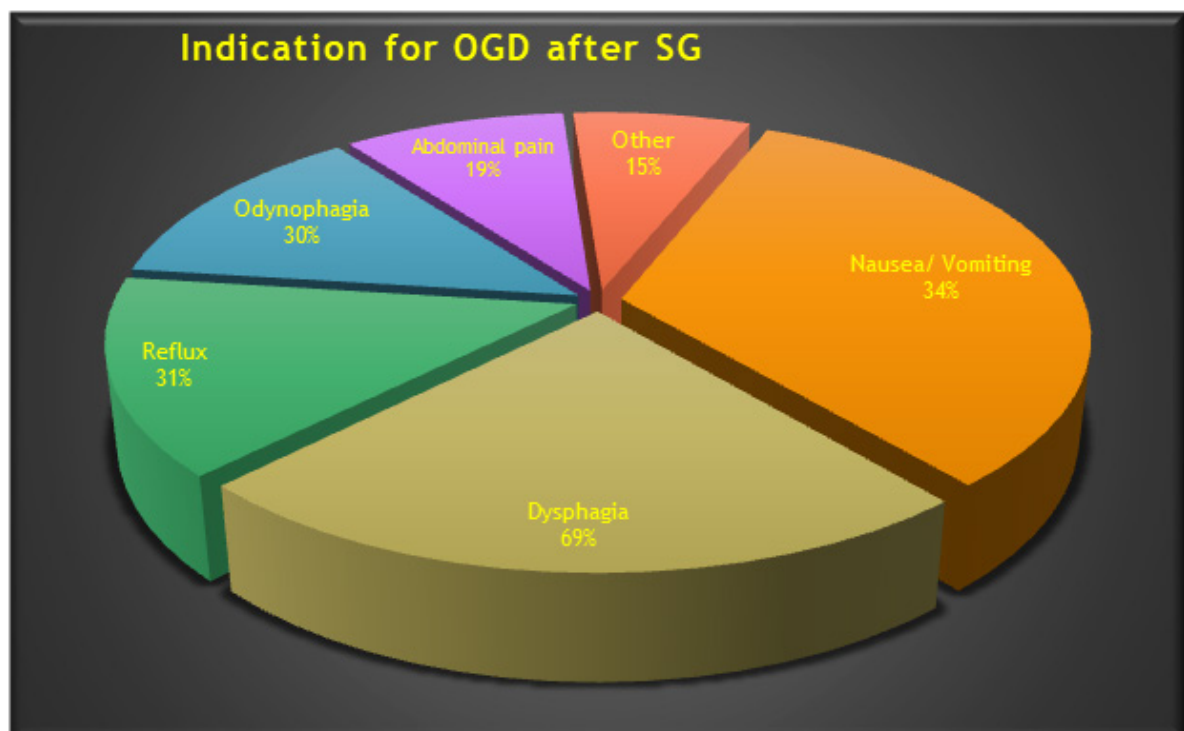
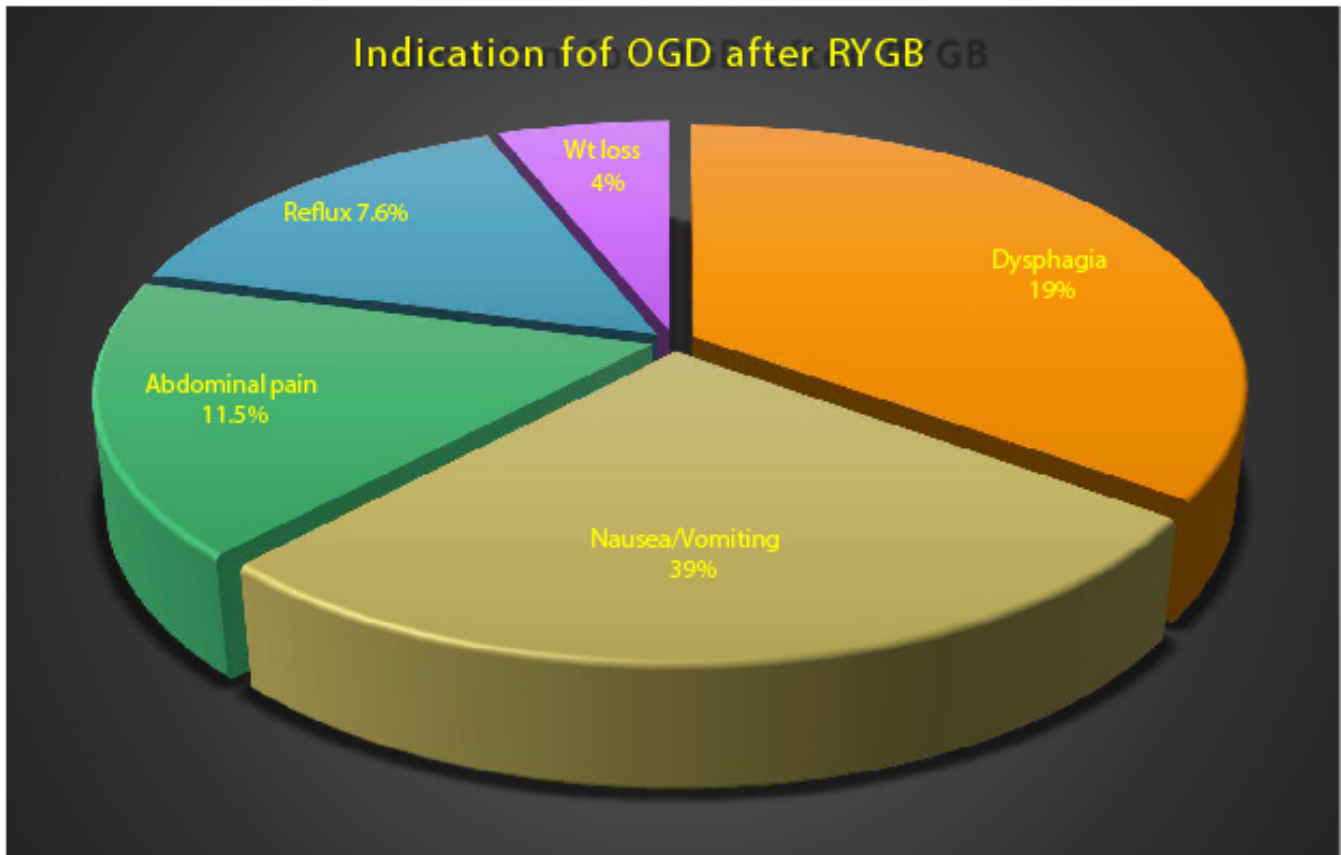


Figure 5: Indication for OGD after RYGB



The majority of patients were managed conservatively. One patient developed severe reflux after SG which was confirmed on OGD. A sleeve stricture was also detected in this patient. The patient was initially treated with conservative management and dilatation of the stricture. As the patient remained symptomatic, revision to RYGB was subsequently undertaken for intractable reflux.

Table 3: Management of patient who underwent OGD following Bariatric Surgery

Post OGD management	Number of patients and percentage %
Conservative management with PPI	47 (90.3%)
Balloon dilatation for stricture after Bypass	3 (5.7%)
Balloon dilatation for stricture after sleeve gastrectomy	2 (3.8%)
Endoscopic stenting for leak after sleeve gastrectomy	1 (1.9%)
Surgery	1 (1.9%)

The regression model showed that the age, gender, type of surgery performed, preoperative BMI, or known history of acid reflux or hiatus hernia, did not predict the need for postoperative OGD.

DISCUSSION

It is well known that bariatric surgery continues to offer good long term weight loss outcomes for patients with morbid obesity, with only a small group of patients experiencing complications. OGD remains the gold standard investigation for exploring persistent foregut symptoms postoperatively, with approximately 1 in 9 patients having an OGD after bariatric surgery according to our study.

The commonest indications for OGD were nausea and vomiting, followed by dysphagia and abdominal pain. Patients who underwent SG more commonly underwent OGD, at approximately 13.1%, compared to 9.4% after RYGB. Such findings could be explained by the greater prevalence of nausea and occasional vomiting following SG in comparison to RYGB. This is also true for reflux symptoms that are more common after SG.

Oesophagitis was the commonest finding in our series (19%), and mostly seen in patients who had SG (9 patients out of 52, 17.3%). This was seen in only in 3 patients who had RYGB (6%) which was statistically significant ($P < 0.05$) This was treated with medical management and proton pump inhibitors (PPI) in all patients, with successful resolution of symptoms. SG creates a high-pressure system in the stomach which makes reflux a problem for some of these patients. The conversion rate in our series from SG to RYGB was within reported range in literature of 6.4% (7)

6 per cent of the cases (three patients) had an anastomotic ulcer after RYGB. This is a known complication of RYGB that is observed more frequently in smokers and those who take non-steroidal anti-inflammatory medication (8). All these patients were managed conservatively with PPI and lifestyle advice. None of the patients needed further surgery and no anastomotic strictures were detected. In total, the percentage of diagnosed anastomotic ulcers in our series was 1.1%. Spaniolas et al described the cumulative percentage of anastomotic ulcers to be 3.2% after 1 year rising to 7.9% after 5 years. This makes our data fall in line with published large series (9).

Twenty-seven patients (5.6%) had a preoperative OGD for variable indications such as heartburn, dysphagia and abdominal pain. It is not routine policy in our unit to perform an OGD on all patients undergoing bariatric unless they have foregut symptoms (pain, reflux, suspicion of hiatus hernia or Barrett's oesophagus). This policy is based on the fact that endoscopy in general rarely changes the course of weight loss surgery in the absence of symptoms.

Abd Ellatif *et al*, showed that asymptomatic patients usually have a normal OGD before surgery, and positive endoscopic findings were more prevalent in symptomatic patients (10). There is more acceptance, though, now that all patients con-

sidered for weight loss surgery should be offered an OGD prior to their operation. During bariatric surgery it was noted that out of 476 patients, 76 (15.8%) had a hiatal hernia and all these patients had simultaneous repair of the hiatus hernias. A routine pre-operative OGD would avoid such surprises intra-operatively and suggest that an endoscopy would have changed the decision for surgery in up 9% of patients.

Two studies suggested that it is essential for the endoscopist to understand the anatomic alterations of the upper GI tract in order to recognize normal and abnormal findings and make appropriate diagnostic and therapeutic decisions (11,12).

The UK has a unique situation where surgeons still prefer to preform endoscopy on their patients post operatively and this makes it easier to identify abnormal pathology due to the knowledge of the anatomy of such operations. However, across Europe and other parts of the world, most of the endoscopic procedures for such patients are performed by medical gastroenterologists rather than surgeons.

Endoscopy, as a diagnostic tool, has expanded our ability to care for some post-bariatric surgery symptoms. Post-operative endoscopy not only helps to identify the altered anatomy in patients who have undergone bariatric operations, but it is also an important tool in the management of post-bariatric surgical complications like bleeding, leaks, strictures, and fistula. (13,14). With the development of advanced endoscopic skills and novel devices, we can control post-operative bleeding with clipping, and suturing devices such as the Over-Stitch™ Endoscopic Suturing System that can reduce the size of a gastric pouch or gastro-jejunal anastomosis. Managing such complications endoscopically can help avoid re-operation. Upper GI Endoscopy can also help with the diagnosis of abdominal pain, nausea and vomiting in patients after weight loss surgery, especially when these symptoms are not very rare and could be difficult to resolve. In RYGB patients it can be vital in identifying problems like anastomotic strictures and marginal ulcers (15).

With more weight loss surgery being performed around the world, endoscopy has also developed a therapeutic role in the management of anastomotic leak and fistula. These are potentially life-threatening and can have a long-term impact. The incidence of leak ranges from 2.1 to 5.2% after SG and 1.7-2.6 % after RYGB (16). Management of leaks and fistula from staple lines have been successfully treated with OGD and stenting. (17).

The published evidence on indications of postoperative OGD in RYGB and SG patients are limited. The indications and findings reported in the majority of studies are similar to our data (10,12,15,16,18). Blom-Høgestøl et reported 10 patients out of 234 needing OGD (4.2%) after RYGB but this was based on data from a questionnaire at 5 years after surgery, and the exact findings of the OGD were not included (15). Abd Ellatif et al studied a large series of cases across multiple centres

and showed OGD to be safe after surgery with effective potential therapeutic use. This series included patients who has SG, RYGB and OAGB (10).

Our study investigated the factors that could predict the need for OGD after surgery as this can be useful in deciding on the type of surgery as well as consent. Despite analysing all related factors, no particular predictor was identified (including pre-operative factors).

Reassuringly, for patients and surgeons alike, a significant portion of postoperative OGDs were normal, with a small proportion of patients requiring further intervention. The standardisation of surgical techniques among surgeons have improved outcomes from bariatric surgery and have limited the frequency of complications. The diligent selection of cases for weight loss surgery has also contributed to decreased complications and consequently the need for further investigations after surgery.

The limitations of our study include being a single centre study. Despite all patients having routine follow up of at least 2 years after surgery, some patients will present to other centres with post operative symptoms and any OGD that was performed may not be reported to our institution. As surgery numbers increase, our pool of data will also expand, meaning more reliable data may be obtained from procedures performed in upcoming years.

In conclusion, patients who undergo SG have a higher chance of needing an OGD post operatively compared to RYGB patients. However, statistical analysis showed no specific factors would put patients at higher risk of needing an OGD after surgery including BMI, age, gender, as well as preoperative conditions such as having a hiatus hernia or gastroesophageal reflux disease.

REFERENCES

1. Marie Ng, Tom Fleming, Margaret Robinson, Blake Thomson, Nicholas Graetz, Christopher Margono, et al. (2014) 'Global, regional, and national prevalence of overweight and obesity in children and adults during 1980–2013: a systematic analysis for the Global Burden of Disease Study 2013', *The Lancet*, 384(9945), pp. 766–781.
2. Chang SH, Stoll CRT, Song J, Varela JE, Eagon CJ, Colditz GA. (2014) The effectiveness and risks of bariatric surgery: an updated systematic review and meta-analysis, 2003-2012. *JAMA Surg* ; 149 pp. 275–87.
3. D J R Morgan, K M Ho, J Armstrong, S Baker (2015) 'Incidence and risk factors for intensive care unit admission after bariatric surgery: a multicentre population-based cohort study', *BR J Anaesth*, 115(6), pp. 873-882.
4. A Desai, G Bahra, A Thillainayagam, A Ahmed (2012) 'Post-operative endoscopy in bariatric surgery patients', *Gut*, 61(2), pp. PMO-198.
5. Brown, W.A., Johari Halim Shah, Y., Balalis, G. et al. (2020) IFSO Position Statement on the Role of Esophago-Gastro-Duodenal Endoscopy Prior to and after Bariatric and Metabolic Surgery Procedures. *OBES SURG* 30, pp, 3135–3153
6. Genco et al (2017) Gastroesophageal reflux disease and Barrett's oesophagus after laparoscopic sleeve gastrectomy: a possible underestimated long-term complication. *SORD* 13(4) pp. 568-574.
7. Huseyin Yilmaz, Ilhan Ece, Mustafa Sahin (2017) 'Revisional Surgery After Failed Laparoscopic Sleeve Gastrectomy: Retrospective Analysis of Causes, Results, and Technical Considerations' *Obes Surg*, 27(11), pp. 2855-2860.
8. Lester Carrodegua, Samuel Szomstein, Flavia Soto, Oliver Whipple, Conrad Simpfendorfer, John Paul Gonzalez, Alexander Villares, Natan Zundel, Raul Rosenthal (2005) 'Management of gastrogastic fistulas after divided Roux-en-Y gastric bypass surgery for morbid obesity: analysis of 1,292 consecutive patients and review of literature', *Surg Obes Relat Dis*, 1(5), pp. 467-474.
9. Konstantinos Spaniolas, Jie Yang, Shelby Crowley, et al (2018) 'Association of Long-term Anastomotic Ulceration After Roux-en-Y Gastric Bypass With Tobacco Smoking', *Gastrointest Endosc*, 153(9), pp. 862-864.
10. Mohamed E Abd Ellatif, Haitham Alfalah, Walid A Asker, Ayman E El Nakeeb, Alaa Magdy et al (2016) 'Place of upper endoscopy before and after bariatric surgery: A multicenter experience with 3219 patients', *World J Gastrointest Endosc*, 8(10), pp. 409–417.
11. Chrysoula P. Malli, Athanasios D. Sioulas, Theodoros Emmanouil, George D. Dimitriadis, and Konstantinos Triantafyllou (2016) 'Endoscopy after bariatric surgery', *Ann Gastroenterol*, 29(3), pp. 249–257.
12. Evans JA, Muthusamy VR, et al. (2015) 'The role of endoscopy in the bariatric surgery patient', *Gastrointest Endosc*, 81(5), pp. 1063-72.
13. Docimo S Jr, Svestka M. (2017) 'Endoscopic Evaluation

and Treatment of Postoperative Bariatric Surgery Complications', *Sure Innov*, 24(6), pp. 616-624.

14. Schulman AR, Thompson CC (2017) 'Endoscopic Evaluation/Management of Bariatric Surgery Complications', *Current Treat Options Gastroenterol*, 15(4), pp. 701-716.
15. Ingvild K. Blom-Høgestøl, Audun Stubhaug, Jon A Kristinsson, Tom Mala (2018) 'Diagnosis and treatment of chronic abdominal pain 5 years after Roux-en-Y gastric bypass', *SOARD*, 14(10), pp. 1544-1551.
16. Kumar N, Thomson CC (2012) 'Endoscopic management of complications after gastrointestinal weight-loss surgery', *Current Treat Options Gastroenterol*, 11(4), pp. 343-353.
17. Puli SR, Spofford IS, Thompson CC (2012) 'Use of self-expandable stents in the treatment of bariatric surgery leaks: a systematic review and meta-analysis', *Gastrointestinal Endoscopy*, 75(2), pp. 287-293.
18. Giovanni D De Palma and Pietro Forestieri (2014) 'Role of endoscopy in the bariatric surgery of patients', *World J Gastroenterol*, 20(24), pp. 7777-7784.