Obesity Surgery (2022) 32:3627–3634
https://doi.org/10.1007/s11695-022-06252-0

ORIGINAL CONTRIBUTIONS

Routine Use of Esophago-gastro-duodenoscopy (EGD) in Bariatric Surgery—an International Survey of Our Current Practice

Sharmaine Yen Ling Quake[1] · Ghazaleh Mohammadi-Zaniani[1] · Aya Musbahi[1] · Oliver Old[2] · Michael Courtney[1] · Peter Small[1]

Received: 1 June 2022 / Revised: 9 August 2022 / Accepted: 19 August 2022 / Published online: 3 September 2022

Abstract

Introduction The role of esophago-gastro-duodenoscopy (EGD) in bariatric surgery has been widely discussed. In 2020, the International Federation for the Surgery of Obesity and Metabolic Disorders (IFSO) issued recommendations on the routine use of EGD before and after bariatric surgery. However, little is known of our current practice and the guidance uptake.

Methods We conducted an international survey assessing bariatric surgeons' practice on the use of EGD. The survey aimed to identify whether surgeons offer EGD in the following settings: pre-operative, post-operative at 1 year, every 2–3 years following longitudinal sleeve gastrectomy (LSG) or one-anastomosis gastric bypass (OAGB). Data was analyzed using descriptive statistics.

Results Among 121 respondents, 72% are aware of the IFSO recommendations. The commonly performed bariatric procedures were LSG, Roux-en-Y gastric bypass (RYGB), and OAGB. 53.7% surgeons routinely offer pre-operative EGD and 14.3% routinely offer post-operative EGD for bariatric patients at 1 year after surgery. Majority do not routinely offer EGD after LSG (74.8%) or OAGB (79.7%) every 2–3 years as proposed by IFSO.

Conclusion The uptake of IFSO recommendation is variable according to each recommendation with better compliance among surgeons with regard to pre-operative EGD. Further research is necessary to develop robust evidence-base for the role of endoscopy after bariatric surgery with the inclusion of patient and public involvement.

Keywords EGD · Endoscopy · Pre-operative · Post-operative

Key Points
- Majority of surgeons routinely offer pre-operative EGD as recommended by IFSO.
- There is less compliance with regard to routine EGD in the post-operative setting.
- Patients' perception on the acceptability of routine EGD should be evaluated.
- The length of follow-up for post-operative EGD after LSG or OAGB is to be defined.

✉ Sharmaine Yen Ling Quake
s.quake@nhs.net

[1] Department of Upper Gastrointestinal and Bariatric Surgery, South Tyneside & Sunderland NHS Foundation Trusts, Sunderland SR4 7TP, UK

[2] Department of Upper Gastrointestinal and Bariatric Surgery, Gloucestershire Hospitals NHS Foundation Trust, Gloucester GL1 3NN, UK

Introduction

The use of esophago-gastro-duodenoscopy (EGD) in bariatric surgery has been widely discussed [1–4]. EGD is useful to detect pathologies that could contraindicate bariatric surgery, for example, malignancy. It is valued in planning the appropriate bariatric procedure given that the diagnosis of other concomitant gastrointestinal conditions such as a large hiatus hernia and peptic ulcer can have an impact on planned surgery [5]. Conditions requiring pre-operative treatment such as *Helicobacter pylori* infection can also be detected. Additionally, endoscopy allows anatomical assessment of distal stomach when it would later be inaccessible following Roux-en-Y gastric bypass (RYGB) and one-anastomosis gastric bypass (OAGB) [6, 7].

The findings from EGD performed in the pre-operative work-up of patients before bariatric surgery have been reported in numerous studies [8–11]. A systematic review of this literature by Brown et al. found that 25.3%

of asymptomatic patients had abnormal findings at pre-op EGD [6]. In a subgroup of these studies that reported on whether these findings influenced management, 16.8% of patients had a change to operative plan, or delayed operation, as a result of the EGD findings [6].

The role of unselected EGD in asymptomatic patients remains a contentious issue with variations in practice. Those who advocate against routine pre-operative EGD cite reasons such as resource allocation, false positives, and low yield of pathology especially in the Caucasian population [5, 12, 13]. Schight et al., based on their prospective database of patients receiving routine pre-operative EGD before longitudinal sleeve gastrectomy (LSG) or RYGB, concluded that the number needed to screen to detect clinically significant abnormalities is high [7]. The invasive nature of EGD also poses risks of bleeding, perforation, and aspiration. Furthermore, overdiagnosis of small hiatus hernias on EGD is a well-known entity and may lead to an unnecessary change of operative approach [14].

The American Society for Metabolic and Bariatric Surgery (ASMBS) recommends selective use of pre-operative EGD in patients with symptoms, whereas European Association for Endoscopic Surgery (EAES) guideline suggests "esophagogastroscopy can be considered as a routine diagnostic test prior to bariatric surgery" [15, 16]. In a UK-based survey in 2015 by the British Obesity and Metabolic Surgery Society (BOMSS), 90% of UK bariatric units surveyed included pre-operative EGD either routinely or selectively [17].

While previous research focused on pre-operative utility of EGD, the literature evaluating the scope of EGD post-operatively is lacking in comparison. However, there is now emerging evidence for a rising incidence of Barrett's esophagus, with an accompanying increased risk of esophageal adenocarcinoma, among patients undergoing certain bariatric procedures [18–20]. This has led some to consider surveillance endoscopy among asymptomatic patients after metabolic surgery.

In 2020, The International Federation for the Surgery of Obesity and Metabolic Disorders (IFSO) issued recommendations on the routine use of EGD before and after bariatric surgery (see Table 1) [6]. However, little is known of our current clinical practice and the uptake of this guidance. Hence, this international study aimed to establish bariatric surgeon's practice on the routine use of EGD with regard to IFSO recommendations.

Methods

Bariatric surgeons, including consultant surgeons, specialists, and specialist trainees, were invited to participate in this study by completing an online survey, assessing their practice on the use of EGD. The survey was disseminated to a global audience via social media outlet, Twitter, and within the United Kingdom (UK) via BOMSS. Written consent was sought at the beginning of the survey and data collected was anonymous. The authors required no ethical approval to complete this study.

Questions were formulated by consensus of a focus group of bariatric specialists in the UK. The survey consisted of questions asking whether surgeons offer EGD for asymptomatic patients in the following settings: pre-operative, post-operative at 1 year, every 2–3 years following LSG or OAGB. Answer options included yes – routinely, yes – selectively, and no – not at all (see the Appendix for survey transcript).

Table 1 IFSO recommendations on the use of EGD prior to and after bariatric surgery [6]

Recommendations of the IFSO Endoscopy in Bariatric Surgery Taskforce	
	1. EGD should be considered for all patients with upper GI symptoms planning to undergo a bariatric procedure due to the frequency of pathology that may alter management
	2. EGD should be considered for patients without upper GI symptoms who are planning to undergo a bariatric procedure due to the 25.3% chance of an unexpected finding that may alter management or contra-indicate surgery
	3. EGD should be routinely considered in populations where the community incidence of significant gastric and esophageal pathology is high, particularly when the procedure will lead to part of the stomach being inaccessible (for example, RYGB and OAGB)
	4. EGD should be undertaken routinely for all patients after bariatric surgery at 1 year and then every 2–3 years for patients who have undergone LSG or OAGB to enable early detection of Barrett's esophagus or upper GI malignancy until more data is available to confirm the incidence of these cancers in practice
	5. EGD should be performed following gastric band and RYGB on the basis of upper GI symptoms

For surgeons who selectively offered EGD, follow-up questions were asked to determine which factors contributed to their selective practice, including but not limited to patient and surgical factors. Skip logic was embedded in selected question stems. Lastly, surgeons were asked if they were aware of the 2020 IFSO recommendations. The survey was open for 3 weeks. Data was analyzed using descriptive statistics.

Results

Baseline Characteristics

There were 121 responses consisting of surgeons of various grades—consultants (80.2%), specialists (4.1%), and higher surgical trainees (15.7%). The commonly performed procedures were LSG (99%), RYGB (94%), and OAGB (55%) (Fig. 1). The mean volume of bariatric surgery undertaken per year is 153 per surgeon and 357 per institution.

Pre- and Post-operative EGD at 1 Year (Fig. 2)

53.7% ($n=65$) of surgeons routinely offer pre-operative EGD for patients before a bariatric procedure. 14.3% ($n=17$) of surgeons routinely offer post-operative EGD for bariatric patients at 1 year after their procedure.

Selective Use of Pre- and Post-operative EGD

17.4% ($n=21$) and 19.3% ($n=23$) of respondents would selectively offer pre-operative EGD and post-operative EGD at 1 year, respectively, to bariatric patients. For these

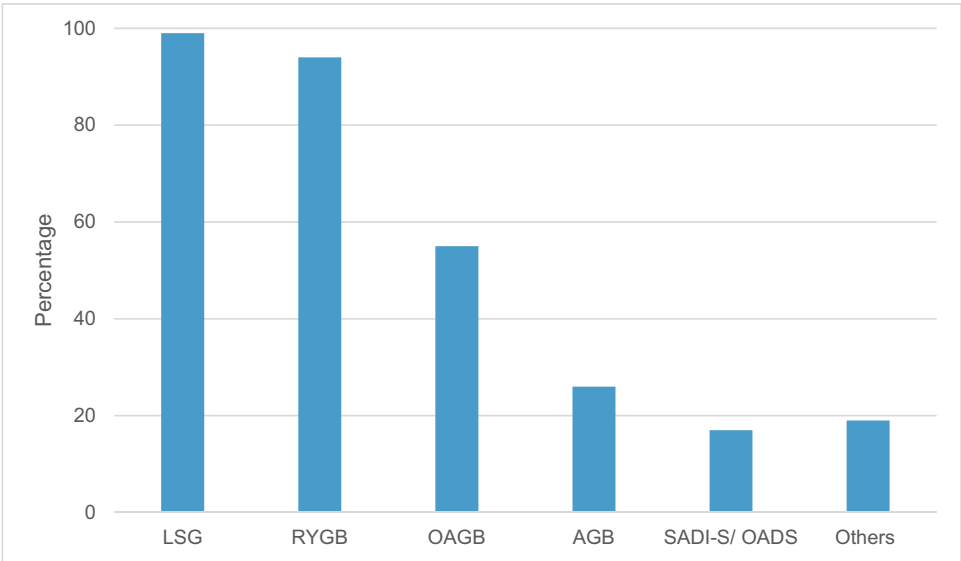

Fig. 1 Repertoire of bariatric procedures performed by individual surgeons worldwide by percentages. LSG, longitudinal sleeve gastrectomy; RYGB, roux-en-Y gastric bypass; OAGB, one-anastomosis gastric bypass; AGB, adjustable gastric band; SADI-S/OADS, single anastomosis duodenal-ileal bypass with sleeve gastrectomy/one-anastomosis duodenal switch

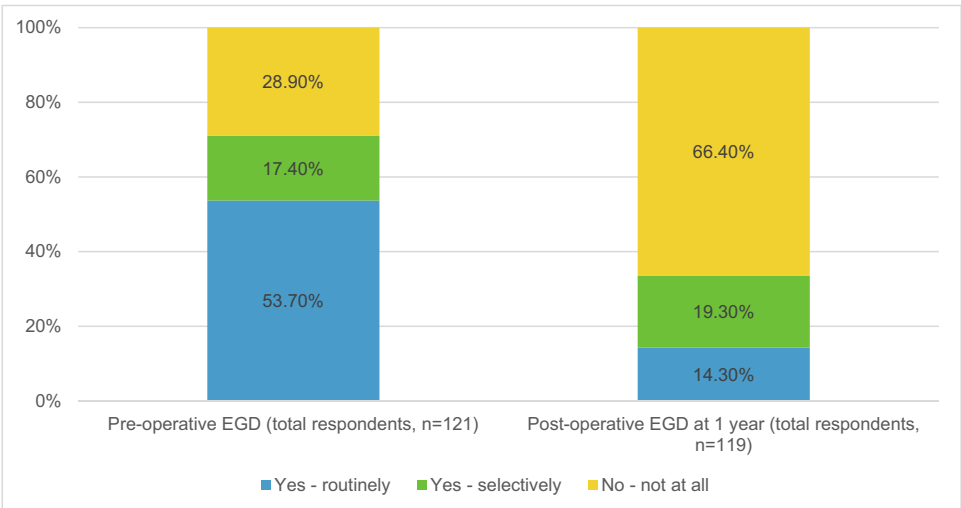

Fig. 2 Bariatric surgeons' practice on the use of pre- and post-operative EGD at 1 year by percentages

Table 2 Factors taken into consideration by surgeons who offer EGD on a selective basis

Question: On what basis do you selectively offer EGD in asymptomatic patients?	Pre-operative EGD [$n=21$]	Post-operative EGD at 1 year [$n=23$]
Patient factors	71.4%	47.8%
Procedural factors	38.1%	47.8%
Revisional surgery	85.7%	34.8%
Others	N/A	13.0%

Table 3 Specific factors taken into consideration by surgeons who offer selective EGD according to percentages

Question: On what basis do you selectively offer EGD in asymptomatic patients?		Pre-operative EGD	Post-operative EGD at 1 year
Patient factors	Age	75.0%	70.0%
	Sex	16.7%	10.0%
	Family history	75.0%	60.0%
Procedural factors	LSG	72.7%	77.8%
	RYGB	27.3%	27.8%
	OAGB	45.5%	33.3%
	AGB	0%	0%
	SADI-S/OADS	18.2%	11.1%

surgeons, among the factors considered were patient and procedural factors (see Table 2).

In the subgroup of surgeons who offer EGD based on patient factors, age and family history were the predominant factors considered. From a procedural perspective, most surgeons offered selective EGD for LSG, OAGB, and RYGB (see Table 3). For post-operative EGD at 1 year, the "others" factor cited was a history of Barrett's esophagus.

Surveillance EGD After LSG and OAGB (Figs. 3 and 4)

25.2% of surgeons routinely offer EGD every 2–3 years after LSG as per IFSO recommendation. Similarly, 20.3% offer EGD every 2–3 years to patients after OAGB.

Awareness of IFSO Recommendations (Figs. 5 and 6)

72% of respondents are aware of the IFSO recommendations on the use of EGD before and after bariatric surgery.

Relationship Between Volume of Bariatric Surgery Cases per Institution and Individual Surgeon's EGD Practice (Fig. 7)

A chi-square statistical analysis was performed to assess for association between annual volume of bariatric cases per institution, and individual surgeon's practice on routine EGD in

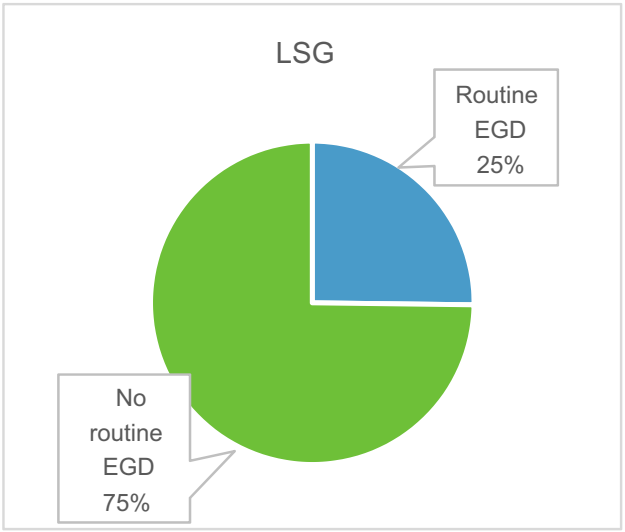

Fig. 3 Percentages of surgeons who routinely offer EGD every 2–3 years after LSG

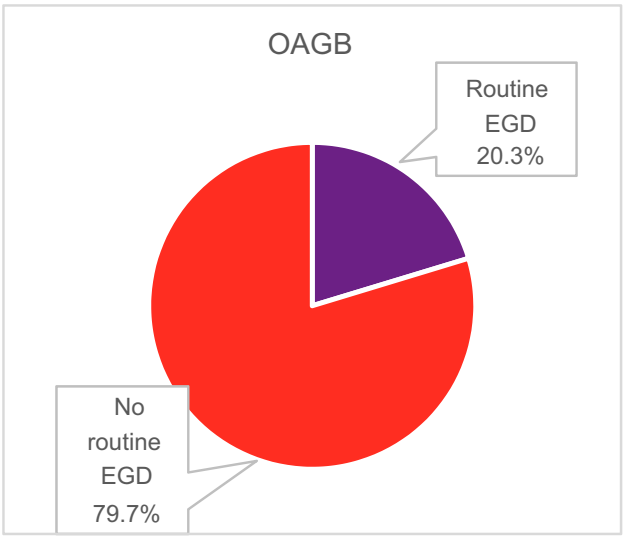

Fig. 4 Percentages of surgeons who routinely offer EGD every 2–3 years after OAGB

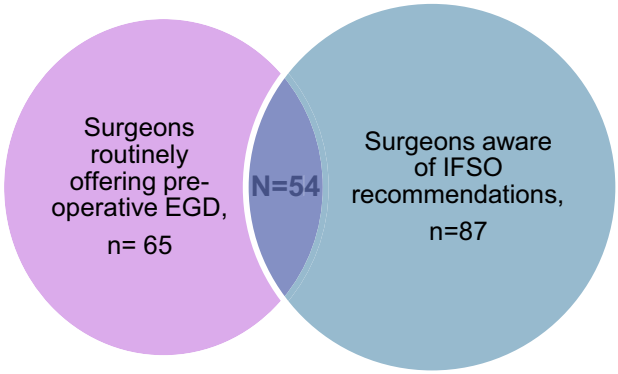

Fig. 5 The proportion of surgeons routinely offering pre-operative EGD and who are aware of IFSO recommendations

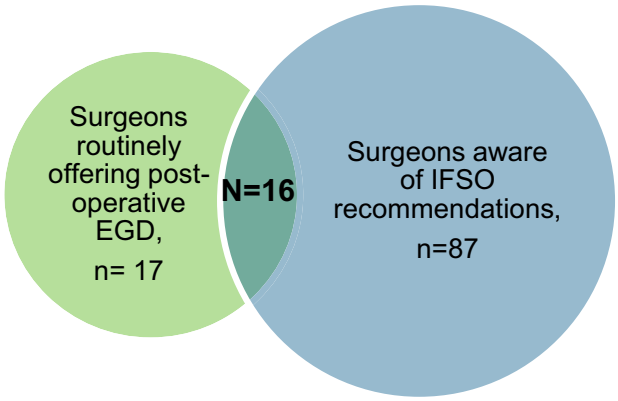

Fig. 6 The proportion of surgeons routinely offering post-operative EGD and who are aware of IFSO recommendations

the following settings: pre-operative, post-operative at 1 year, every 2–3 years after LSG, and every 2–3 years after OAGB.

Data on annual volume of bariatric cases per institution were categorized into two cohorts: low-volume centers and high-volume centers. In this context, a high-volume center is defined an institution that performs > 125 bariatric surgical cases per year, according to the ASMBS designation for Bariatric Surgery Centre of Excellence [21].

There is a statistically significant association ($p = 0.0214$) between annual volume of bariatric cases per institution and whether pre-operative EGD is routinely offered. Of surgeons practicing in low-volume centers, a greater proportion offered pre-operative EGD. In all other settings, no statistically significant association was identified.

Discussion

Our survey is the first international study to examine bariatric surgeons' practice on the use of EGD since the publication of the IFSO position statements. Our findings demonstrate that slim majority of surgeons worldwide routinely offer EGD for patients before bariatric surgery (53.7%); most surgeons in this subset were aware of IFSO recommendations (see Fig. 5). Several factors could account for surgeons deciding not to offer EGD, such as low suspicion of abnormal pathology, availability of EGD, financial implications on patient and/or institution, cost-effectiveness, and lack of awareness of current recommendations.

Interestingly, for pre-operative EGD, there is a statistically significant association between volume of bariatric surgery cases per institution and surgeon's practice on the use of EGD (see Fig. 7). Of surgeons practicing in low-volume centers, a greater proportion offered pre-operative EGD compared to those in high-volume centers. The latter, due to the volume of bariatric surgeries offered, may have longer endoscopy waiting time with higher throughput, placing increased demands on endoscopy services. Hence, surgeons in high-volume centers who have more operative experience may be more selective in offering pre-operative EGD. Additionally, surgeons in low-volume centers are probably more guideline driven.

In 2000s, the cost of performing routine EGD on all patients prior to bariatric surgery in the USA was 699.92 USD per clinically important lesion detected [8]. In comparison in Switzerland, the mean cost of EGD, including follow-up investigations and therapies prompted by EGD findings, was 389 ± 116€ per patient [22]. Furthermore, patient-related factors such as refusal of EGD, inability to travel, and inability to commit to long-term follow-up might contribute to low uptake of EGD.

Implementation of the IFSO recommendations will require expansion of resources to provide a robust EGD service, which would be a competing interest among other health priorities in a national or public health system. Private healthcare systems may be more willing to adopt IFSO' recommendations; however, financial barriers will preclude some patients from accessing bariatric surgery and the advocated EGDs.

In the post-operative context of bariatric surgery, our survey showed that most surgeons do not routinely offer EGD at 1 year after surgery (85.7%), despite majority of these surgeons being aware of the IFSO recommendations (see Fig. 6). This may be attributed to the perceived limited yield from routine endoscopy post-bariatric surgery [6]. It is also important to note that EGD in bariatric patients requires specialized skills as the foregut anatomy is altered after certain procedures; therefore, those who are not trained or competent in endoscopy may be less inclined to offer it.

This also raises an important question of whether the operating surgeon is solely responsible for the performance of post-operative EGD, whatever the duration of follow-up

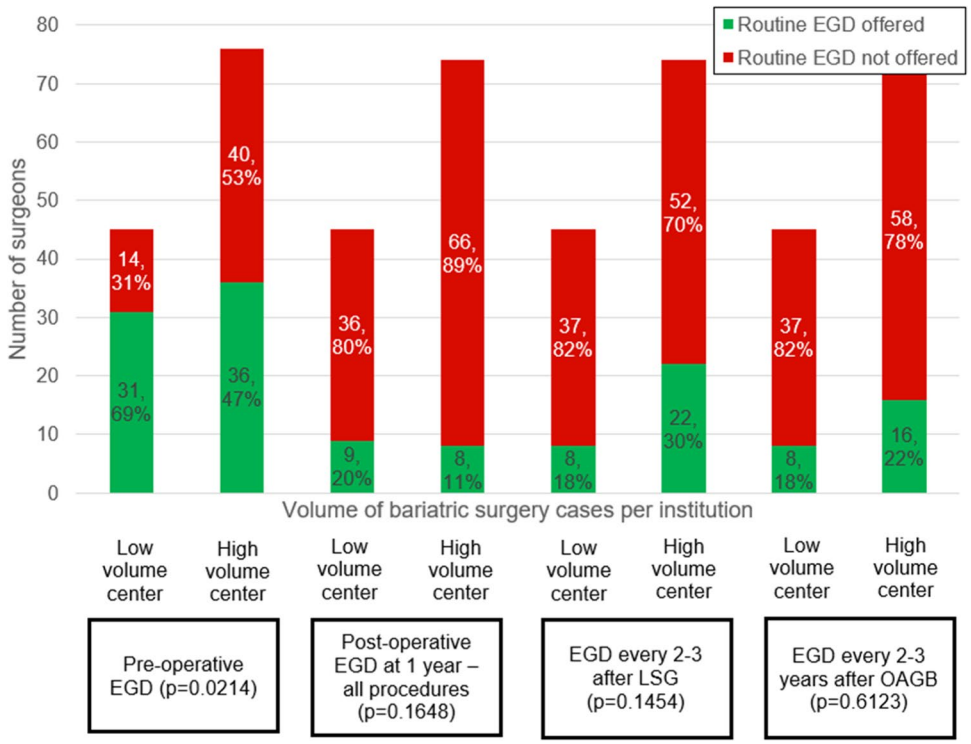

Fig. 7 Relationship between volume of bariatric surgery cases per institution and individual surgeon's practice on routine EGD

endoscopy may be. Bariatric surgeons have the responsibility to offer post-operative EGD to their patients. If they are unable to perform the EGD themselves, for any reasons, it is prudent to offer patients onward referral to other practitioners who are suitably trained to perform EGD in patients after metabolic surgeries. Another potential solution to this would be enrolling patients onto automatic surveillance pathways, such as currently established for patients with Barrett's esophagus. Conversely, some may argue that the responsibility is shared between the surgeon and patient, particularly when follow-up endoscopy may be lifelong.

According to our findings, generally, most respondents also do not routinely offer EGD after LSG (74.6%) or OAGB (79.7%) every 2–3 years as proposed by IFSO. Previous studies in the literature suggested poor correlation between upper gastrointestinal symptoms and development of Barrett's esophagus after LSG, hence IFSO's recommendation for EGD every 2–3 years after LSG [18–20]. While evidence from large-volume prospective trials is lacking, the prevalence of Barrett's esophagus after LSG is reported to be high from a recent meta-analysis, with most cases observed after 3 years of follow-up [22]. The same EGD recommendation is made by IFSO for patients after OAGB because of theoretical risk of bile reflux leading to malignancy [6, 23]. However, there are limited case reports of upper gastrointestinal malignancy published in the literature following OAGB [24–26].

The duration of surveillance EGD recommended in the post-operative setting after LSG and OAGB is not specified. The length of follow-up in bariatric patients has an impact on the feasibility of this recommendation. For example, in the UK, patients are followed-up for 2 years; therefore, it is likely that most UK surgeons would not offer EGD 2–3 years after LSG or OAGB. Indeed, a subset analysis of UK surgeons within our survey revealed that only 2% would offer EGD post-LSG and 4% post-OAGB at an interval of every 2–3 years.

Committing to longer term follow-up involving periodical endoscopy requires patient involvement in this decision-making process. Some patients may decline surgery on such basis due to the invasive nature of EGD and its associated risks. Patient and public involvement is advocated to determine the acceptability and suitability of this. Introducing the IFSO recommendation on post-operative EGD in the surgical information and consent form is a step toward making this recommendation as part of our standard practice. However, in patients who do not consent to long-term follow-up EGD, the question remains whether this will exclude them from being considered for metabolic surgery.

Limitations

Our survey did not distinguish between surgeons in public and/or private practice. This could be an interesting factor to consider in future studies as one could hypothesize that those in private practice would be more motivated to offer routine EGD, due to financial gains and risk of litigation.

It is possible that the COVID-19 pandemic might have impacted surgeons' practice. The questionnaire did not specify a timeline of practice and answers are therefore likely to represent pre-COVID-19 practice.

Further research is needed by means of a registry study to accurately determine the scope of endoscopic investigations, especially in the post-operative setting. The future use of metrics and algorithms to determine likelihood of needing an EGD would be an interesting frontier. A survey of bariatric patients' perception on the acceptability of regular EGDs, particularly after surgery, and the inclusion of this as part of consent for metabolic surgery, would be helpful.

Conclusion

Majority of bariatric surgeons worldwide offer routine pre-operative EGD, with a smaller proportion offering routine post-operative EGD. Further research is necessary to develop robust evidence-base for the role of endoscopy after bariatric surgery with the inclusion of patient and public involvement.

Appendix. Survey Transcript

Survey title: EGD before and after bariatric surgery—what is your current practice?

Demographics	
1. In which country do you base your practice?	
2. What grade/ level are you? Please select which applies	> *Consultant/attending* > *Specialist non-consultant/ equivalent* > *Higher specialist trainee [fellow/resident/ registrar]*
3. Please provide an estimate of the volume of bariatric surgery you are involved in each year	
4. Please provide an estimate of the volume of bariatric surgery undertaken at your unit each year	
5. Which of the following bariatric surgeries do you perform? Please select all that apply	> *LSG, RYGB, OAGB, AGB, SADI-S/OADS, others [please specify]*
Pre-operative EGD	
6. Do you routinely offer pre-operative EGD for asymptomatic patients undergoing bariatric surgery?	> *Yes, for all patients prior to bariatric surgery* > *Yes, on a selective basis* > *No, I do not routinely offer EGD prior to bariatric surgery*
7. On what basis do you selectively offer pre-operative EGD in asymptomatic patients?	> *Patient factors* > *Procedural factors* > *Revisional surgery* > *Others [please specify]*
a. If you selected patient factors, please select all that apply b. If you selected procedural factors, please select all that apply	> *Age. Sex. Family history* > *LSG. RYGB. OAGB. AGB. SADI-S/ OADS*
Post-operative EGD	
8. Do you routinely offer EGD at 1 year for asymptomatic patients after bariatric surgery at 1 year?	> *Yes, for all patients after bariatric surgery at 1 year* > *Yes, on a selective basis* > *No, I do not routinely offer EGD after bariatric surgery at 1 year*
9. On what basis do you selectively offer post-operative EGD in asymptomatic patients at 1 year?	> *Patient factors* > *Procedural factors* > *Revisional surgery* > *Others [please specify]*
a. If you selected patient factors, please select all that apply b. If you selected procedural factors, please select all that apply	> *Age. Sex. Family history* > *LSG. RYGB. OAGB. AGB. SADI-S/OADS*
Screening/ surveillance EGD	
10. Do you routinely offer EGD every 2–3 years for patients who have undergone LSG?	> *Yes. No*
11. Do you routinely offer EGD every 2–3 years for patients who have undergone OAGB?	> *Yes. No*
IFSO recommendations	
12. Are you aware of the IFSO recommendations on the routine use of EGD in bariatric surgery?	> *Yes. No*

Author Contribution All authors made substantial contribution to study design, data analysis, data interpretation, and writing of manuscript and approved the submitted final version.

Declarations

Consent to Participate Informed consent was obtained from all individual participants included in the study.

Conflict of Interest Mr. Peter Small is the Chairman of National Bariatric Surgery Registry and a trustee of British Obesity and Metabolic Surgery Society; both are unpaid roles.

Statement of Human and Animal Rights This article does not require formal ethical approval; however, it is in accordance with the ethical standards of the 1964 Helsinki declaration and its later amendments.

References

1. Salama A, Saafan T, El Ansari W, et al. Is routine preoperative esophagogastroduodenoscopy screening necessary prior to laparoscopic sleeve gastrectomy? Review of 1555 cases and comparison with current literature. Obes Surg. 2018;28(1):52–60.
2. El Ansari W, El-Menyar A, Sathian B et al. Is routine preoperative esophagogastroduodenoscopy prior to bariatric surgery

mandatory? Systematic review and meta-analysis of 10,685 patients. Obes Surg. 2020;30(8):3073–83.
3. Parikh M, Liu J, Vieira D, et al. Preoperative endoscopy prior to bariatric surgery: a systematic review and meta-analysis of the literature. Obes Surg. 2016;26(12):2961–6.
4. Bennett S, Gostimir M, Shorr R, et al. The role of routine preoperative upper endoscopy in bariatric surgery: a systematic review and meta-analysis. Surg Obes Relat Dis. 2016;12(5):1116–25.
5. Mong C, Van Dam J, Morton J, et al. Preoperative endoscopic screening for laparoscopic Roux-en-Y gastric bypass has a low yield for anatomic findings. Obes Surg. 2008;18(9):1067–73.
6. Brown WA, Johari Halim Shah Y, Balalis G, et al. IFSO position statement on the role of esophago-gastro-duodenal endoscopy prior to and after bariatric and metabolic surgery procedures. Obes Surg. 2020;30(8):3135–53.
7. Schigt A, Coblijn U, Lagarde S, et al. Is esophagogastroduodenoscopy before Roux-en-Y gastric bypass or sleeve gastrectomy mandatory? Surg Obes Relat Dis Off J Am Soc Bariatr Surg. 2014;10(3):411–7 (quiz 565–6).
8. Sharaf RN, Weinshel EH, Bini EJ, et al. Endoscopy plays an important preoperative role in bariatric surgery. Obes Surg. 2004;14(10):1367–72.
9. Muñoz R, Ibáñez L, Salinas J, et al. Importance of routine preoperative upper GI endoscopy: why all patients should be evaluated? Obes Surg. 2009;19(4):427–31.
10. Abou Hussein B, Khammas A, Shokr M, et al. Role of routine upper endoscopy before bariatric surgery in the Middle East population: a review of 1278 patients. Endosc Int Open. 2018;6(10):E1171–6.
11. Moulla Y, Lyros O, Mehdorn M et al. Preoperative upper-GI endoscopy prior to bariatric surgery: essential or optional? Obes Surg. 2020;30(6):2076–84.
12. Abd Ellatif ME, Alfalah H, Asker WA, et al. Place of upper endoscopy before and after bariatric surgery: a multicenter experience with 3219 patients. World J Gastrointest Endosc. 2016;8(10):409–17.
13. Ge L, Moon RC, Nguyen H et al. Pathologic findings of the removed stomach during sleeve gastrectomy. Surg Endosc. 2019;33(12):4003–7.
14. Mohammed R, Fei P, Phu J, et al. Efficiency of preoperative esophagogastroduodenoscopy in identifying operable hiatal hernia for bariatric surgery patients. Surg Obes Relat Dis. 2017;13(2):287–90.
15. Campos GM, Mazzini GS, Altieri MS, et al. ASMBS position statement on the rationale for performance of upper gastrointestinal endoscopy before and after metabolic and bariatric surgery. Surg Obes Relat Dis. 2021;17(5):837–47.
16. Di Lorenzo N, Antoniou SA, Batterham RL, et al. Clinical practice guidelines of the European Association for Endoscopic Surgery (EAES) on bariatric surgery: update 2020 endorsed by IFSO-EC, EASO and ESPCOP. Surg Endosc. 2020;34(6):2332–58.
17. Zanotti D, Elkalaawy M, Hashemi M, et al. Current status of preoperative oesophago-gastro-duodenoscopy (OGD) in bariatric NHS units—a BOMSS survey. Obes Surg. 2016;26(9):2257–62.
18. Genco A, Soricelli E, Casella G, et al. Gastroesophageal reflux disease and Barrett's esophagus after laparoscopic sleeve gastrectomy: a possible, underestimated long-term complication. Surg Obes Relat Dis Off J Am Soc Bariatr Surg. 2017;13(4):568–74.
19. Sebastianelli L, Benois M, Vanbiervliet G, et al. Systematic endoscopy 5 years after sleeve gastrectomy results in a high rate of Barrett's esophagus: results of a multicenter study. Obes Surg. 2019;29(5):1462–9.
20. Felsenreich DM, Kefurt R, Schermann M, et al. Reflux, sleeve dilation, and Barrett's esophagus after laparoscopic sleeve gastrectomy: long-term follow-up. Obes Surg. 2017;27(12):3092–101.
21. BSCOE.pdf [Internet]. [cited 2022 Jul 18]. Available from: https://www.obesityaction.org/wp-content/uploads/BSCOE.pdf
22. Azagury D, Dumonceau JM, Morel P, et al. Preoperative work-up in asymptomatic patients undergoing Roux-en-Y gastric bypass: is endoscopy mandatory? Obes Surg. 2006;16(10):1304–11.
23. Qumseya BJ, Qumsiyeh Y, Ponniah SA, et al. Barrett's esophagus after sleeve gastrectomy: a systematic review and meta-analysis. Gastrointest Endosc. 2021;93(2):343-352.e2.
24. Aleman R, Lo Menzo E, Szomstein S, et al. Efficiency and risks of one-anastomosis gastric bypass. Ann Transl Med. 2020;8(Suppl 1):S7.
25 Runkel M, Runkel N. Esophago-gastric cancer after one anastomosis gastric bypass (OAGB). Chir Buchar Rom 1990. 2019;114(6):686–92.
26. Aggarwal S, Bhambri A, Singla V, et al. Adenocarcinoma of oesophagus involving gastro-oesophageal junction following mini-gastric bypass/ one anastomosis gastric bypass. J Minimal Access Surg. 2020;16(2):175–8.