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RESEARCH ARTICLE

Intraoperative decision making in bariatric surgery

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ABSTRACT

Background: Surgeons may encounter unexpected anatomical or pathological findings during various bariatric surgical procedures for which they must make prompt and critical decisions that had not been planned prior to the operation. In this practice review, we present our experiences with unexpected challenges and on-table decision making in bariatric surgery to share our knowledge with colleagues who may encounter the same challenges during bariatric surgery. This paper's content is of applied learning and practical value focusing on challenging intraoperative decision making; however, it does not discuss the details of the various techniques used during surgery.

Methods: This work is a single-center retrospective review of operations carried out on patients who had unexpected intraoperative findings during bariatric surgery despite the implementation of detailed preoperative evaluations that would have otherwise suggested standard procedures. These findings resulted in abandoned surgery or laparoscopic sleeve gastrectomy instead of the intended Roux-en-Y gastric bypass.

Results: A total of 449 patients had received various bariatric interventions in our unit between 2012 and 2016. Eleven patients, representing approximately 2.4% of the total number of patients surveyed had met the inclusion criteria and were added to the final list for analysis. The mean age of the included patients was 40.82 years (range: 30 – 51 years), and seven of the patients, representing approximately 63.6% of the included cases, were female. The mean body mass index of the 11 cases was 40.8 (range: 38 – 48). Only two cases (18.9%) had had their surgery abandoned; the rest (81.1%) had received laparoscopic sleeve gastrectomy instead of Roux-en-Y gastric bypass. None of the 11 patients had perioperative morbidity or mortality.

Conclusion: Intraoperative decision making for unexpected findings in bariatric surgery is challenging. In these circumstances, surgeons must make prompt and critical decisions, including abandoning the operation. The available literature on this subject is unsurprisingly limited because of the rarity of such findings.

Keywords: bariatric surgery, metabolic surgery, intraoperative challenges, decision making, weight loss surgery

INTRODUCTION

Decision making in patients who are already fully anesthetized is a well-recognized but challenging aspect of general surgery. Efficient and prompt intraoperative decision making is one of the key elements of successful outcomes in surgical practice. Surgeons generally apply four principles in their intraoperative decision making, namely, direct recognition; rule based, option comparison, and creativity. However, surgeons' operating experience, technical proficiency, and previous postoperative reflections also make remarkable contributions to their decisions. Furthermore, intraoperative decision making could be significantly affected by high uncertainty, inadequate information, shifting goals, high time pressure, and uncalculated risk.[1,2] A typical scenario in which decision making is necessary is when a surgeon encounters completely unexpected pathological or anatomical intraoperative findings despite the implementation of a thorough preoperative assessment strategy, as it is the case with bariatric and metabolic surgery.

Obesity is considered an ongoing major health issue worldwide. According to the World Health Organization, obesity has reached epidemic proportions with more than one billion overweight adults reported globally, at least 300 million of whom are clinically obese. Therefore, obesity is a major contributor to the global burden of chronic disease and disability.[3]

Compared with non-surgical management, bariatric and metabolic surgery is considered a more successful and reliable strategy for obesity and some of its associated comorbidities. As such, the number of bariatric and metabolic surgery procedures performed worldwide has increased, and this trend has led to surgeons encountering unexpected intraoperative challenges.[4,5]

Bariatric and metabolic surgery, particularly laparoscopic Roux-en-Y gastric bypass (LRYGB), is technically demanding. Therefore, this procedure should be performed in centers with great expertise in this technique and preceded by a structured preoperative patient assessment that is based on agreed national guidelines.[2]

In all circumstances, surgeons should act in the patient's best interest by using an analytical approach and considering all possible options, including asking an experienced colleague for a second opinion or even abandoning surgery, before deciding to move forward with the operation. Surgeons should also carefully weigh potential risks and complications against the intended benefits of their intraoperative decisions.[6,7]

In our bariatric unit, we perform LRYGB in antecolic fashion as standard practice or laparoscopic sleeve gastrectomy (LSG) when relevant. Our patients meet the national guidelines for bariatric or metabolic surgery.[8] The choice of surgery is made at the multidisciplinary team (MDT) level, but the patient's preference is taken into consideration when applicable. We selectively perform preoperative diagnostic Oesophago-Gastro-Duodenoscopy (OGD), especially in patients with symptoms warranting OGD, anemia, or a family history of gastric cancer. However, we note that the routine or selective role of preoperative diagnostic OGD in bariatric surgery remains controversial on account of the actual clinical implications of the OGD findings and costs related to this procedure.[9]

Our patients usually adopt a liver size-reducing diet for at least 2weeks before the day of surgery. Our fully informed consent process for patients intending to have LYRGB discusses the option of performing LSG as an alternative operation if the surgeon feels intraoperatively that the bypass procedure is technically not possible or safe to perform; abandoning surgery is also specified as a possible option. We do not perform sleeve gastrectomy in patients suffering from significant gastroesophageal reflux disease.

In this study, we present several unexpected intraoperative challenges we encountered in our bariatric surgery unit to share our knowledge with colleagues who may encounter similar challenges in future operations. The content of this paper is of applied learning and practical value, focusing on the challenges of intraoperative decision making; it does not discuss details of the various techniques used during bariatric surgery.

METHODS

This study represents a single-center (Darlington Memorial Hospital, Darlington, UK) retrospective review of operations performed on patients who revealed unexpected intraoperative findings during bariatric surgery despite detailed preoperative evaluations that would have otherwise suggested standard procedures. According to local policies, ethical approval was not necessary for this type of study. All of our patients consented to having photographs of their visceral organs taken and findings during laparoscopic surgery collected. Our review does not contain any information that could potentially be used to identify any of the patients.

According to our database, 449 patients underwent various bariatric interventions in our unit between 2012 and 2016. Over this period, we prospectively collected a list of the details of all patients who were intended to have LRYGB but received LSG or whose surgery was abandoned because of unexpected findings. Patients who had unexpected intraoperative pathological or anatomical findings were added to this list, providing that their preoperative written and electronic (e.g., clinical, biochemical, radiological, and endoscopic, whenever relevant) records did not indicate a potentially challenging surgery.

We used Statistical Package for Social Sciences (IBM Corp. Armonk, New York, USA) for data analysis and set the level of statistical significance to a probability value of $p \leq 0.05$. Because our study focused on a very small number of patients, we only used basic descriptive statistical figures to describe our results. This decision was based on a statistician's advice, given that the study outcome would not be valid or reliable by any known statistical method. When the sample size, particularly in the treatment/intervention arm, is very small, the power/weight of any study will be very low and its outcome will not be statistically significant.[10] We will explore this limitation in greater detail in the Discussion section of this article.

RESULTS

Eleven patients, representing approximately 2.4% of the total number of patients surveyed, met the inclusion criteria and were added to our final list. The demographics of these 11 patients are summarized in Table 1. The mean age of the included patients was 40.82 years (range: 30 – 51 years), and seven patients, representing approximately 63.6% of the included patients, were female. The mean body mass index of the 11 cases was 40.8 (range: 38 – 48). Only two cases (18.9%) had their surgery abandoned; the rest (81.1%) received LSG instead of LRYGB. None of the 11 patients had perioperative morbidity or mortality. We describe the operative findings in these 11 cases, discuss the rationale behind the intraoperative decisions made, and provide published evidence to support these decisions in the following section.

Analysis

The following sections discuss our unexpected intraoperative findings. Table 1 shows the patients' demographic characteristics.

Pancreatitis

Obesity results in increased risk and severity of pancreatitis due to the increased likelihood of gallstone formation, hypertriglyceridemia, and medications. Obesity exacerbates the severity of acute pancreatitis by allowing the unregulated lipolysis of visceral fat enriched with unsaturated triglycerides, which causes necrosis.[11]

Pancreatitis could result in significant adhesions in the lesser sac and render the fashioning of the gastric pouch in gastric bypass surgery technically difficult. Inflammation also presents a potential risk of pancreatic injury and formation of pancreatic fistula. LSG could be an alternative option to gastric bypass in this case, but only when it is technically and anatomically safe and feasible.

A 32-year-old female without a history of previous pancreatitis was scheduled to have LRYGB (Table 1). Intraoperatively, we found out that the lesser curve and parts of the body of the stomach were significantly adherent to the pancreas, indicating a previous inflammatory process in this area. Therefore, we believed that the intended LRYGB surgery would not be a safe and viable option because of the inherent risks described above; mini-gastric bypass surgery was also not a suitable option for the same reasons. We performed LSG instead because this procedure was technically and anatomically safe. In this case, we formed a standard vertical sleeve starting proximal to the pylorus and extending up to the angle of His using a linear laparoscopic stapler beyond the adherent pancreatic tissue (Figure 1). The patient had an uneventful recovery and satisfactory follow-up outcome.

Table 1. Patient demographics, unexpected intraoperative findings, and outcomes

Unexpected intraoperative finding	Number of included cases out of 449 cases (%)	Gender, age (years)	Body mass index	Comorbidities	Intended surgery	Surgery performed/ Outcome
Unexpected adhesions in the lesser sac due to previously unrecorded pancreatitis	1 (0.22%)	Female, 32	39	None	LRYGB	LSG
Ectopic pancreatic tissue (e.g., small incidental tumor-like lesions at a small bowel segment)	1 (0.22%)	Female, 36	40	Arthritis, hypercholesteremia	LRYGB	Surgery abandoned
Incidental gastrointestinal tumor at the gastric fundus	1 (0.22%)	Male, 50	38	DM type 2, arthritis, hypertension	LRYGB	Surgery abandoned
Liver surface nodularity indicating cirrhosis	3 (0.67%)	Female,50; female, 49; male, 51	Female, 44; female, 43; male, 48	Hypertension, arthritis, hypercholesteremia	LRYGB	Liver biopsy and LSG
Constipation (fecal loading of the transverse colon)	1 (0.22%)	Male, 40	42	DM type 2, arthritis, hypercholesteremia	LRYGB	LSG
Hepatomegaly	1 (0.22%)	Male, 39	40	DM type 2, arthritis, hypercholesteremia	LRYGB	LSG
Splenomegaly	1 (0.22%)	Female, 30	38	Hypertension, arthritis, hypercholesteremia	LRYGB	LSG
Unexpected pelvic adhesions	2 (0.45%)	Female,33; female, 38	Female 38; female, 39	Hypertension, arthritis, hypercholesteremia	LRYGB	LSG

Abbreviations: LRYGB- Laparoscopic Roux-en-Y gastric bypass, LSG- Laparoscopic sleeve gastrectomy, DM- Diabetes mellitus%.

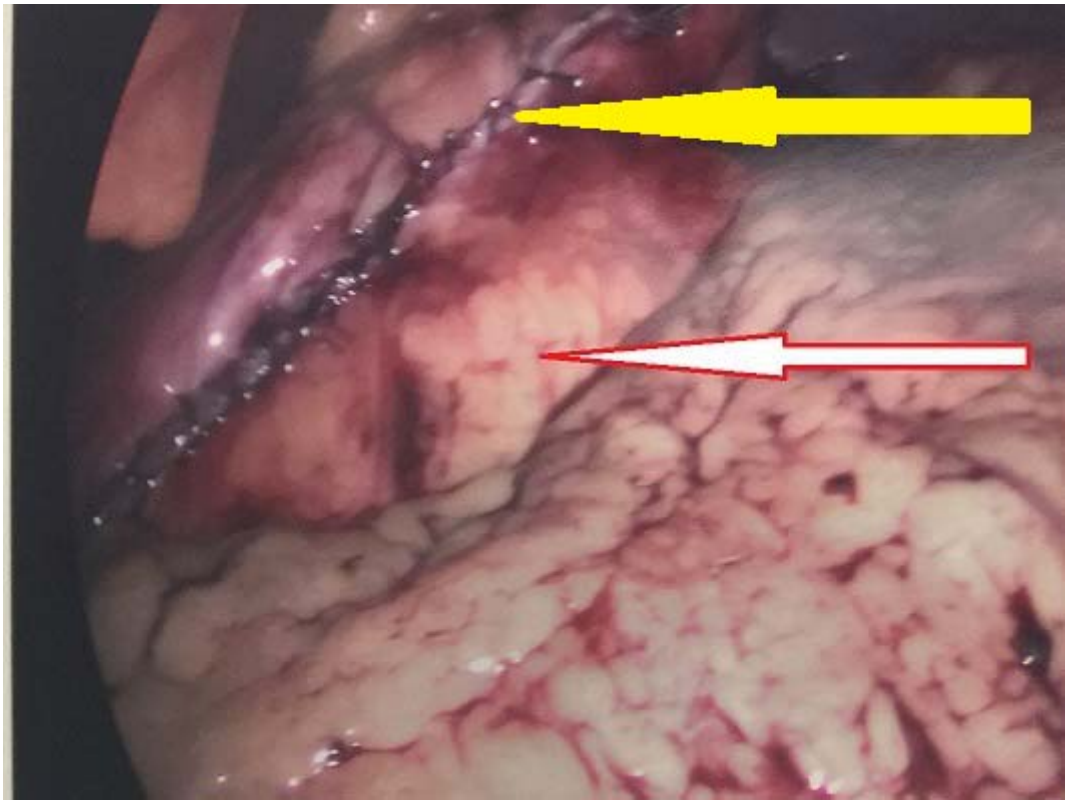

Figure 1. Pancreas adherent to the back of the stomach due to lesser sac adhesions from previous pancreatitis (white arrow). The resection margin (staple line) of the sleeve gastrectomy was applied safely beyond the adherent pancreatic tissue (yellow arrow).

This case represented approximately 0.22% of the total number of patients surveyed. While we did not find similar scenario reported in the literature, we believe that LSG in this case would not be advisable if the adhesions were denser and restricted the mobilization of the greater curve. We advise bariatric surgeons to keep in mind that some patients may have undiagnosed or officially unrecorded past attacks of pancreatitis that would only be identified on the operating table.

Aberrant anatomical findings

The presence of aberrant anatomical findings should alert the operating surgeon to adopt an alternative strategy or even abandon surgery. During the diagnostic phase of an LRYGB procedure in a 36-year-old female, we noticed a small tumor-like lesion on the jejunum measuring approximately 2 cm in size. Since the malignancy of the lesion could not be macroscopically excluded, we performed a biopsy of the lesion and abandoned the operation instead. We did not have a facility to carry out frozen-section histology at the time of the operation. The patient did not have any postoperative complications and was discharged home pending the results of the biopsy. The patient did not have any preoperative symptoms of abdominal pain or gastrointestinal bleeding. Biopsy results confirmed that the lesion was ectopic pancreatic tissue. Subsequently, the patient received LRYGB because the location of the ectopic pancreatic tissue did not preclude the formation of the Roux-en-Y configuration through a 50 cm biliopancreatic limb and a 150 cm alimentary limb. The patient had an uneventful recovery and satisfactory follow-up outcome.

An ectopic pancreas refers to the presence of aberrant pancreatic tissue that lacks communication with the normally located pancreas. The prevalence of ectopic pancreatic tissue in the general population ranges from 0.25% in surgical explorations to 14% in autopsies.[12] While the most common location of ectopic pancreas is along the greater curve of the stomach, it can also be found along any part of the gastrointestinal tract. It could be asymptomatic and identified incidentally during surgery or radiological investigations, or it could present symptoms such as abdominal pain, bleeding, and obstruction; this

aberrant tissue is known to have a risk of malignant transformation.[13]

Published works have reported the concept of intraoperative management of incidental findings of ectopic pancreatic tissue during bariatric surgery. Decision making in such scenarios depends on the size and location of the ectopic pancreas, as well as the surgeon's preference. The consensus from these reports is either resection of the ectopic pancreas (wedge resection) and continuation with the intended operation when possible or a different operation, for instance, LRYGB instead of LSG, or abandonment of surgery.[13,14] Our case represents approximately 0.22% of the total number of patients surveyed (Table 1), a number that is close to the reported prevalence in the literature.[12]

Unexpected pathological findings: Gastrointestinal stromal tumor

A 50-year-old male was scheduled for LRYGB surgery (Table 1). Preoperative checks did not indicate a potentially challenging surgery, and no indication in the patient's past history warranted a preoperative OGD. However, during the initial diagnostic laparoscopic checks, a small indentation was noticed at the stomach fundus. After taking biopsies from the lesion, we performed on-table OGD, which showed the features of non-erosive gastritis but no other abnormality. The surgery was abandoned with the agreement of two consultant bariatric surgeons because we did not have a facility to carry out frozen-section histology. The subsequent histology report confirmed that the lesion was a low-grade gastrointestinal stromal tumor (GIST). The patient had staging Computerized Tomography scan, and the case was further discussed with the tertiary center at the MDT level.

The MDT advice was to perform LSG. This advice was based on the fact that the location of the small low-grade GIST would be suitable for a potential full resection during a sleeve gastrectomy. Performing gastric bypass would not guarantee the full resection of the lesion due to its anatomical location.

The MDT advice was discussed with the patient, who agreed to have surgery in the form of sleeve gastrectomy. The procedure was performed successfully, and the patient had an uneventful recovery. The histology report confirmed a fully resected GIST with R0 margins. The patient's postoperative follow-up outcome was satisfactory.

The literature indicates that LSG is being increasingly recognized as a concomitant treatment option for obesity and GISTs. GISTs are usually located along the distribution of the interstitial cells of Cajal, especially in the gastric fundus and cardia. As these lesions are unlikely to be detected during the preoperative work up, we recommend inspection of the stomach during the diagnostic laparoscopy phase for such tumors. A previous review noted: "When a GIST is suspected during a bariatric procedure, a frozen section may be performed to confirm the diagnosis and rule out gastric cancer."[15]

Our case represents approximately 0.22% of the total number of patients surveyed. We found a significant variation in the reported incidence of GISTs because of factors such as methodological issues reporting and the diagnostic criteria. However, the gender distribution of these tumors appears to be fairly equal between males and females.[16]

Unexpected pathological findings: Liver cirrhosis

According to the literature, unexpected macroscopic signs of liver cirrhosis may be discovered in 1 – 5% of patients may during bariatric surgery.[17,18] Emerging evidence also indicates that bariatric surgery significantly improves nonalcoholic fatty liver disease and metabolic syndrome.[19] However, liver cirrhosis is associated with increased likelihood of bleeding in any type of surgery because of defects in liver function and portal hypertension. Compared with gastric bypass, LSG is considered to be more suitable for patients with liver cirrhosis because the former is associated with alteration of the normal anatomy. Thus, the stomach remnant would not be accessible for endoscopic intervention in the event of a gastrointestinal bleeding, which a condition that is fairly common in this group of patients. In addition, gastric bypass may render any future liver transplantation more challenging or lead to progressive hepatic dysfunction given that the procedure is associated with a higher risk of vitamin deficiencies.[20]

Three of our patients, representing approximately 0.67% of the total number of patients surveyed, were expected to receive LRYGB (Table 1). The patients' demographics were similar to the figures published in the literature.[17] Preoperative assessments did not indicate the presence of a liver pathology. However, the initial diagnostic laparoscopy phase of the gastric bypass operations of these patients showed macroscopic signs of liver cirrhosis, specifically, a nodularity

of the liver surface. Therefore, LSG was performed with liver biopsy instead. All three patients had an uneventful postoperative period and clinical follow-up.

Bariatric surgery maybe associated with a higher overall risk of complications and perioperative mortality in advanced liver cirrhosis; thus, LSG is the safest bariatric surgery option for individuals with compensated cirrhosis without significant portal hypertension.[17,21] No standard liver cirrhosis screening in patients undergoing bariatric or metabolic surgery is yet available; therefore, surgeons must discuss the possibility unexpected intraoperative signs of liver cirrhosis with all bariatric patients during the informed consent process and an alternative course of action, if needed intraoperatively, must be agreed upon.[17]

Hepatomegaly and splenomegaly

Significant hepatomegaly or splenomegaly or both may obscure a safe view and, hence, access, to the diaphragmatic hiatus, the gastroesophageal junction, and the angle of His. Thus, performing laparoscopic gastric bypass in such a scenario carries the potential risk of esophageal, hepatic, and splenic injuries. Although the presence of significant hepatomegaly (i.e., a particularly large left lobe of the liver) may sometimes be overcome by adding an extra left port to introduce a second liver retractor, this strategy is not always a successful approach. We successfully performed LSG instead of gastric bypass in two of our cases with hepatomegaly and splenomegaly (Table 1). We felt that performing gastric bypass in these two cases would be associated with a higher risk of complications because of the very limited space available to perform a gastrojejunal (GJ) anastomosis safely (Figure 2). Abandoning surgery and putting the patient on a liver-reducing diet before attempting another surgical intervention is another option for this finding. Performing preoperative imaging, such as abdominal ultrasound scan, to identify significant

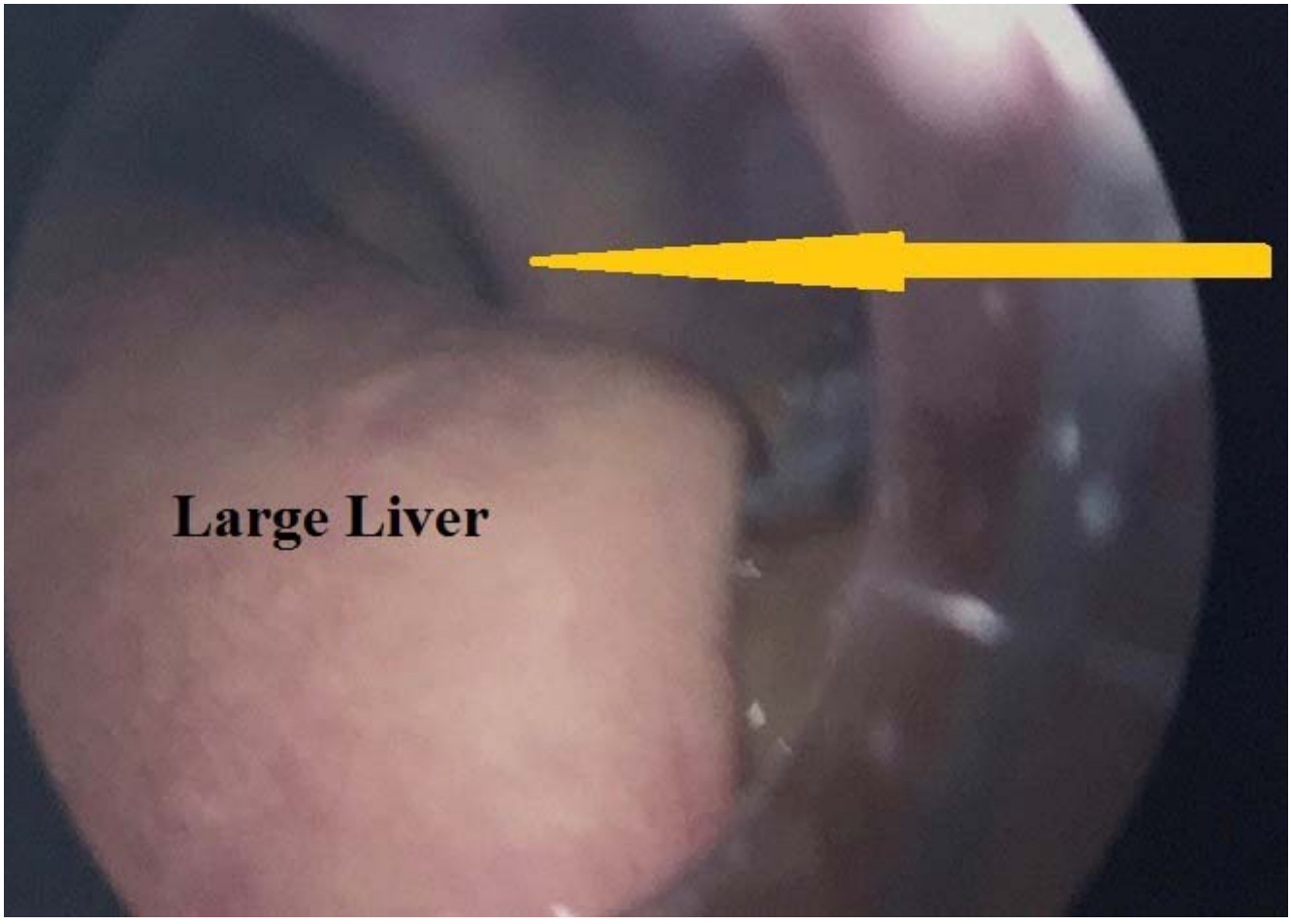

Figure 2. Hepatomegaly. The liver extended into the left upper quadrant of the peritoneal cavity (arrow) and completely obscured the hiatal view.

hepatosplenomegaly is not usually a reliable approach in this context because of the inconsistency and variability in how measurements are made by sonographers.[22]

Constipation

A 38-year-old female was scheduled to have LRYGB (Table 1). The patient did not have a history of irritable bowel syndrome or constipation. Intraoperative findings revealed a large transverse colon filled with hard feces. Thus, we felt that performing routine antecolic gastric bypass could not be carried out safely without causing tension at the GJ anastomosis site. LSG was performed instead with a successful outcome. While we did not identify similar cases in the literature, we believe that a retrocolic gastric bypass under experienced hands could be considered a suitable option in such a scenario. This supposition is supported by a previous systematic review.[23]

Adhesions and technical challenges

A history of previous abdominal surgery would normally alert surgeons to the possibility of potential challenges due to adhesions. However, while some patients may not have any history of previous abdominal surgery, they could still have congenital band adhesions, especially in the pelvis. The prevalence of congenital bands remains unclear because these structures are only identified when they cause bowel obstruction or as an incidental finding during various surgical interventions.[24] Two of our patients who received LSG instead of the intended LRYGB showed pelvic adhesion restricting the mobilization of the small bowel (Table 1). Both patients did not have a history of abdominal surgery/trauma or inflammatory conditions. Thus, we strongly advise surgeons to check that the small bowel is free from significant adhesions and tension before deciding to proceed with gastric bypass surgery to achieve the desired small-bowel length and avoid the risk of leak and tension at the sites of anastomoses. If doing so is not possible, the following options may be suitable: remove the adhesions when doing so is safe and technically feasible (one or two extra 5mm ports maybe necessary, releasing the angle of His first to decrease the tension at the potential GJ anastomosis site, divide the greater omentum prior to fashioning the GJ anastomosis, perform sleeve gastrectomy, or abandon surgery. We recommend the same for patients who have a short small-bowel mesentery.

Other reported challenges: Hernias

Bowel obstruction due to primary hernias after bariatric surgery may present serious and life-threatening complications. Reports of simultaneous mesh repair of hernias with bariatric surgery, which carries a risk of mesh infection of approximately 5%, have been published.[25]

However, we have not found strong current evidence to support this approach. In our unit, we do not perform simultaneous mesh repair of hernias with bariatric surgery for two reasons. First, we wish to avoid the risk of mesh infection, which could result in catastrophic complications, because many bariatric patients are diabetics. Second, we wish to avoid the extended use of anesthesia in this high-risk group of patients. An incidental finding of an undiagnosed primary and small paraumbilical hernia during bariatric surgery could be addressed in the same setting by suture repair only.

DISCUSSION

LRYGB and LSG are common and effective surgical interventions in the field of bariatric and metabolic surgery, and both operations are reported to have very low morbidity and mortality rates.[26] Nevertheless, given the ongoing increase in the number of bariatric and metabolic surgical interventions performed worldwide, surgeons are also increasingly encountering unexpected or rare intraoperative findings. In these circumstances, surgeons must make a prompt and critical decision that they had not planned for prior to surgery. A recent report stated: "Surgery is a dynamic process, where procedure suspension, change in the original plan, or adding extra procedures may also occur".[27]

On-table decision making for unexpected findings is undoubtedly challenging because the application of the four decision-making principles in surgery (i.e., recognition, evidence based, comparison and creativity) in rare surgical scenarios is not always helpful. As a rule of thumb, any intraoperative decision making should consider the patient's best interest, even if the operation must be abandoned. However, the decision to abandon surgery is not easy to make. Bariatric patients are generally considered to have higher anesthetic risk compared with non-bariatric patients because of the complexity of their anatomical, physiological, and even pathological status. Indeed, many of these patients go through long preoperative clinical, anesthetic, psychological, and dietary

assessments before they are added to the waitlist for surgery. Therefore, abandoning their surgery could result in major psychological disappointment to these patients and their families; moreover, the financial impact of such a decision cannot be ignored. Thorough preoperative assessment, including detailed check lists, should always be implemented to decrease the possibility of unexpected findings. The fully informed consent process should highlight these uncommon scenarios and include potential alternatives if the intended surgery is not technically feasible or safe. It should also clearly highlight the possibility of abandoning surgery for unexpected intraoperative anatomical or pathological findings.

In this study, we have presented our experiences with unexpected intraoperative findings and on-table decision making in bariatric surgery to share our knowledge with colleagues who may encounter the same challenges in future operations. The number of patients included in the final analysis of our study is small because the related scenario is rather uncommon. The current paucity in the published literature regarding these challenges reflects the rarity of this issue.

Studies of a small sample size, such as ours, tend to have a very wide confidence interval resulting in a statistically less reliable and valid outcome because the true prevalence lies anywhere between the high and low values of the confidence interval.[28] Researchers know that statistical analysis cannot be properly implemented in studies with samples smaller than 30, particularly in the intervention arm.[29] Nevertheless, the value of the current study lies in its presentation of uncommon experiences with intraoperative decision making for unexpected findings during bariatric and metabolic surgery, particularly in light of the fact that a research gap in this topic exists.

We have discussed our intraoperative decision making and approach in managing these unexpected scenarios in detail and supported our analysis with published evidence whenever available. However, the related evidence is fairly sparse and statistically weak because of the rarity of such scenarios. None of the 11 patients had perioperative morbidity, and no mortality was reported. The histopathological findings of the gastric sleeves of the patients who received LSG instead of LRYGB were not remarkable, apart from the expected case with gastric GIST, which was fully resected. Similar to the published literature, we highly recommended routine histopathological examination of sleeve gastrectomy specimens to exclude unexpected pathologies.[30]

Our safety profile in intraoperative approach and decision making in these rare scenarios is comparable with those described in other authors' reports.[27] Seeking a second opinion form an experienced colleague or high-volume centers and having frozen-section histology services available could save patients from having their operations abandoned. We have summarized the highlights of this article in Table 2. We have also listed further research questions in Table 3.

CONCLUSION

Efficient and prompt decision making is one of the key elements of a successful outcome in surgical practice.

Table 2. Main article highlights

- Unexpected anatomical or pathological findings in patients who are already anesthetized present a considerable challenge to bariatric and general surgeons.
- The process of fully informed consent should explore and include potential alternatives if the intended surgery is not technically feasible or safe because of unexpected findings. It should also clearly highlight the possibility of abandoning surgery.
- Prospective data collection of uncommon intraoperative findings during bariatric and metabolic surgery is strongly advised to increase knowledge and awareness through publications and high-quality congress presentations.

Table 3. Further research questions

- Is an algorithm needed to help manage bariatric patients who are already anesthetized and reveal unexpected anatomical or pathological findings?
- What is the psychological impact of abandoning surgery because of unexpected intraoperative findings on bariatric patients and their families?

Intraoperative decision making for unexpected anatomical and pathological findings in bariatric and metabolic surgery is challenging because of the rarity of these findings and the lack of reliable guidelines on this matter. Therefore, our study outcome is statistically limited by the small number of patients included in the final analysis list should not be surprising. Any fully informed consent process should involve a detailed discussion with the patient about the alternative intraoperative strategies that may be taken by the surgeon when they encounter uncommon findings. In all circumstances, surgeons must decide on a surgical strategy according to the patient's best interest. Bariatric units are strongly encouraged to publish or present their experiences in the management of unexpected intraoperative findings.

Because of the lack of published literature regarding this topic, we encourage other bariatric units to publish their unexpected intraoperative findings. Such publications could pave the way for other authors to perform comprehensive review articles that would examine these uncommon intraoperative scenarios and develop an algorithm that may be used to predict such scenarios. We also strongly advise the collection of prospective data of any uncommon intraoperative difficulty encountered during any bariatric procedure to increase the knowledge and awareness of such events through publications and oral/video presentations.

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Conflict of interests

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