

# Short-term Outcomes after Bariatric Surgery during the COVID-19 Pandemic

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## ABSTRACT

**Background:** Elective surgery, especially bariatric surgery, was stopped during the coronavirus disease-2019 (COVID-19) pandemic in the United Kingdom. Obesity is a major risk factor for COVID-19-related mortality. As the COVID-19 infection and mortality rates in Devon had been relatively low, bariatric procedures resumed with the necessary precautions in Plymouth with the easing of lockdown restrictions in mid-May. The aim of this study was to examine the outcome of bariatric surgery during the COVID-19 pandemic.

**Methods:** Details of 38 patients, who underwent bariatric surgery between June 2020 and November 2020, were analyzed prospectively. All patients underwent a COVID-19 swab test 24–48 hours prior to the surgery. The primary outcome measure was COVID-19-related morbidity. Secondary outcomes were non-COVID-19-related morbidity, mortality, and weight loss at 6-week follow-up.

**Results:** Thirty-eight patients [24 females; median age 51 (24–63) years, median body mass indices (BMI) at surgery 42.9 (32.4–62.5) kg/m<sup>2</sup>] underwent bariatric surgery. Thirty-seven patients were of White British ethnicity. No patient tested positive for COVID-19 pre- and postoperatively. No patient had any COVID-19-related morbidity or mortality. One patient developed a staple line bleed and returned to theater for relook laparoscopy and hemostasis. One patient developed an anastomotic leak and had a relook laparotomy for lavage and drain placement. The median length of hospital stay was 1 day. One patient was preplanned for intensive care admission and he stayed in a high dependency unit (HDU) for 1 day. All patients were followed up for 6 weeks and the median (range) excess weight loss (%EWL), at 6 weeks, was 24.4% (–0.9–53.6).

**Conclusion:** Bariatric surgery can be performed safely in an area of low COVID-19 prevalence with the necessary precautions.

**Keywords:** Bariatric surgery, COVID-19 pandemic, Precautions, Roux-en-Y gastric bypass, Sleeve gastrectomy.

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## INTRODUCTION

The World Health Organization (WHO) declared the coronavirus disease-2019 (COVID-19) pandemic on March 11, 2020, with more than 11 million cases reported worldwide and over 540,000 deaths.<sup>1</sup> Indeed, most organizations including the International Federation for the Surgery of Obesity and Metabolic Diseases (IFSO) have recommended postponing all elective and endoscopic procedures related to bariatric surgery.<sup>2</sup> The American College of Surgeons has also triaged procedures on the morbidly obese and recommended delaying all elective bariatric procedures.<sup>3</sup> The aim was to minimize risks to the patient and healthcare team and to reduce unnecessary usage of limited resources. The results from a large international study involving over 1,000 patients in 24 countries have documented a significant risk of mortality following perioperative COVID-19 infection in elective surgical patients.<sup>4</sup> However, these were stratified neither according to surgical procedure nor country and local infection rates.

The prevalence of COVID-19 infection varies throughout the United Kingdom. While London and the North West had an infection rate of 40 per 100,000, Devon and Cornwall counties in the southwest had less than 20 confirmed cases per 100,000.<sup>5</sup> Mortality rates at 41 per 100,000 had also remained much lower here than most of England (137 per 100,000 in London).<sup>6</sup> Routine operations at our hospital had ceased with the announcement of national lockdown on March 23, 2020. However, certain urgent elective procedures, including cancer and emergency procedures, continued with close adherence to the evolving national and local safety guidelines. Encouraged by the favorable outcomes from these procedures, bariatric surgery was restarted as the rate of infection decreased and lockdown restrictions eased. The aim of this

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study was to determine the outcomes of elective bariatric surgery during this phase of the COVID-19 pandemic.

## METHODS

As this was a review of current practice, no formal ethical approval was required. Informed consent was obtained from all patients. Our local review board approved this study.

Details of 38 consecutive patients, who underwent elective bariatric surgery between June 1, 2020, and November 30, 2020, as performed by three bariatric surgeons in a tertiary care hospital, were analyzed prospectively according to the STROBE guidelines.<sup>7</sup>

The primary outcome measure was COVID-19-related mortality and morbidity at a 6-week follow-up. The secondary outcome measures were non-COVID-19-related morbidity as defined by the Clavien-Dindo classification,<sup>8</sup> in-hospital mortality, and length of hospital stay.

**Standard of Care**

Patients with body mass indices (BMI) greater than 40 kg/m<sup>2</sup> or 35–39.9 kg/m<sup>2</sup>, with at least one obesity-related comorbidity, were offered bariatric surgery following successful completion of a supervised tier-3 weight management program. A multidisciplinary team that includes a bariatric medical specialist, specialist bariatric nurse, dietitian, and surgeon is involved in a comprehensive assessment of the patient. Formal psychological assessment is undertaken following a routine screening questionnaire. In general, patients are given a choice between Roux-en-Y gastric bypass (RYGB) and sleeve gastrectomy (SG). RYGB is preferred if patients suffer from gastroesophageal reflux disease. SG is usually offered to patients with a BMI greater than 60 kg/m<sup>2</sup>. Patients undergo a supervised low-calorie liver-reducing diet for 3 weeks prior to surgery.

Our technique of RYGB involves the creation of an approximately 30-mL gastric pouch. The small bowel is divided 50 cm from the ligament of Treitz creating the proximal biliopancreatic limb, which is then anastomosed to a 100-cm-long alimentary limb. The alimentary limb is then advanced to the gastric pouch for an antecolic antegastric end-to-side gastrojejunostomy, which is then closed with a double-layered 3/0 STRATAFIX™ (Johnson & Johnson). The SG involves an initial 60-mm green stapler (Powered ECHELON FLEX™ GST System, Johnson & Johnson) with reducing staple height according to tissue thickness over a 34-French orogastric bougie, starting at least 3 cm from the pylorus and ending at 2 cm from the gastroesophageal junction. After the gastric mobilization is completed, 20 mg of hyoscine butylbromide is given intravenously. The systolic blood pressure is reduced to approximately 100 mm Hg prior to stapling and then increased to 140 mm Hg after stapling is completed, to reveal any staple line bleeding. Active bleeding points are then either clipped or sutured with 2/0 PDS<sup>R</sup> II (polydioxanone, Johnson & Johnson). All patients receive 1 g of tranexamic acid routinely at the beginning of the procedure. A leak test is performed routinely on all patients. Dual consultant operating occurred only for mentoring purposes and in selected patients.

Ward-based care is provided for all patients unless preoperative anesthetic assessment recommends a higher level of care. Patients are allowed to drink free fluids postoperatively. Patients are discharged on the first postoperative day if well, on a liquid diet for 2 weeks. This is increased to a pureed diet for further 2 weeks. Patients are reviewed initially after 1 week by phone followed by a clinical review in 6 weeks, 3 months, and 6 months. Excess weight loss (%EWL) is calculated with a target BMI of 25 kg/m<sup>2</sup>. Patients are then reviewed at 1 and 2 years prior to being discharged to their general practitioner if there are no ongoing concerns. Nutritional supplements and blood tests are in line with British Obesity & Metabolic Surgery Society (BOMSS) recommendations.<sup>9</sup>

**COVID-19 Precautions and Deviations from Standard of Care**

*Preoperative*

We resumed bariatric surgery with patients who had been categorized as urgent from our waiting list. All patients were requested to self-isolate for 14 days prior to surgery. Preoperative

COVID-19 swab tests were performed between 24 and 48 hours prior to surgery. Results were available within 24 hours. Computed tomography (CT) of the thorax was not routinely performed preoperatively. Patients were informed that there was a slightly increased risk of developing COVID-19-related morbidity as part of the consent process but no detailed figures on risk were given.

*Intraoperative*

Based on evolving national and local guidelines, anesthesia and surgery were performed in amber personal protective equipment (PPE) (visor/goggles, standard surgical masks). A closed filtration system was used to safely evacuate pneumoperitoneum before trocar removal and closure.<sup>10</sup>

*Postoperative*

Patients were nursed in a COVID-19 light ward. Asymptomatic elective patients with a negative COVID-19 swab test who had been isolating for 14 days were admitted there. Emergency patients were only admitted there after 24 hours, in our Surgical Admissions Unit (SAU) in addition to ensuring that they were asymptomatic from COVID-19 point of view with negative swab tests. COVID-19 swab tests were performed if patients developed a temperature.

**RESULTS**

Demographic and treatment details are listed in Table 1. All patients underwent preoperative COVID-19 swab tests. No patients were diagnosed with COVID-19 in the preoperative screening process. All patients who were offered surgery agreed to undergo the procedure. Two patients required postoperative COVID-19 swab test according to hospital testing protocol and had negative results. All procedures were completed laparoscopically. One patient who developed an anastomotic leak had a re-look laparotomy, lavage, and drain placement.

Outcomes are detailed in Table 2. One patient, who underwent a SG re-laparoscopy on day 1 for a staple line bleed, had no active bleeding point but a hematoma around the staple line was evacuated. This was managed by lavage and partial oversewing of the staple line. The patient was monitored on the high

**Table 1:** Demographic and treatment details

Total number	38
Male:female	14:24
Median age (range) years	51 (24–63)
Median BMI at surgery, kg/m <sup>2</sup>	42.9 (32.4–62.5)
Ethnicities	37 White British; 1 Black British/Caribbean
<b>Comorbidities</b>	
Diabetes	21
Hypertension	13
Osteoarthritis	19
Respiratory disease	9
Chronic kidney disease	4
Nonalcoholic fatty liver disease (NAFLD)	7
Polycystic ovarian disease	2
Obstructive sleep apnea	11
<b>Surgical approach</b>	
Laparoscopic	38
Open	0

**Table 2:** Outcomes (Clavien-Dindo classification—CD)

Overall morbidity	3
Postoperative intractable nausea and vomiting (PONV)	1 (CD i)
Postoperative bleed	1 (CD iiib)
Anastomotic/staple line leak	1 (CD iiib)
Wound infection	1
Pneumonia	1 (CD ii)
Acute kidney injury	1 (CD iva)
In-hospital mortality	0
Median length of hospital stay, days	1 (1–44)
30-day readmission rate	1

dependency unit (HDU) for 3 days and she was discharged on the 7th postoperative day. One patient underwent preplanned monitoring in HDU due to preexisting dialysis-dependent chronic kidney disease. He was transferred to the surgical ward on day 1 and discharged on the following day. One patient with RYGB presented to emergency department with complaints of severe nausea and vomiting 10 days following surgery. A barium swallow did not reveal any mechanical obstruction. Her symptoms settled with antiemetics and she was discharged home the next day. One patient who underwent RYGB developed hemodynamic instability on the second postoperative day. A relook laparoscopy was converted to a laparotomy, washout, and drain placement for a leak at the gastrojejunal anastomosis. He suffered acute kidney injury and required intensive therapy unit (ITU) support for 10 days. He was discharged after 44 days, eating and drinking when a barium swallow confirmed resolution of leak.

All patients were followed up at 6 weeks. The median (range) excess weight loss (%EWL) was 24.4% (–0.9–53.6), taking a BMI of 25 kg/m<sup>2</sup> as target. The median difference in BMI was 4.2 (–0.4–9.6). The median loss of weight in kilograms was 12.8 (–1.2–25.4) which translated to a median 9.52% (–0.5–21.1) loss of total body weight. No patients developed any respiratory symptoms suggestive of COVID-19 even during the “second wave” of the pandemic in the United Kingdom (UK). There were no patients lost to follow-up.

## DISCUSSION

The COVID-19 pandemic has highlighted the significance of the obesity crisis as it is an independent risk factor for severe illness and death from COVID-19.<sup>11,12</sup> Even prior to the COVID-19 outbreak, the stigma surrounding obesity has been known to lead to delays and underutilization of bariatric surgery.<sup>13</sup>

The pandemic will result in further delays because of limited resources and the misconception that such surgery should be the last resort.<sup>14</sup> A lack of understanding about the complex nature of obesity has led to the suggestion that these patients can simply be put on a diet until the pandemic is over. The increased morbidity and mortality in obese patients with COVID-19 have understandably resulted in a cautious approach toward the resumption of elective bariatric procedures in the current climate. However, our patient population are reporting increased levels of anxiety over the media coverage regarding the link between obesity and adverse outcomes with COVID-19. Patients are anxious to undergo their bariatric surgery to reduce these risks that have been documented in the published literature.<sup>15–17</sup>

Numerous societies including the IFSO, Diabetes Surgery Summit (DSS), and Società Italiana di Chirurgia dell’Obesità e

malattie metaboliche (SICOB) have recommended the cessation of bariatric surgery.<sup>2,18,19</sup> However, The American Society of Bariatric and Metabolic Surgery have categorically stated that metabolic surgery is not elective and disagrees with the concept that bariatric surgery should be postponed until the pandemic is declared over.<sup>20</sup> Studies confirm a survival benefit with metabolic surgery and its ability to significantly improve life-threatening obesity-related conditions.<sup>21,22</sup> Moreover, Prachand et al. have labeled this as “medically necessary time-sensitive surgery.”<sup>23</sup> Delays for months and potentially years, given the huge backlog, will unquestionably lead to the detriment of these patients and result in an increased burden on the healthcare system.

As the COVID-19 infection and mortality rates in Devon had been relatively low, urgent elective and cancer surgery continued throughout the pandemic with good outcomes.<sup>24</sup> Along with a thorough risk assessment and support from hospital management, bariatric surgery was restarted as the rate of infection decreased and lockdown restrictions eased from June 2020 onward. The principle finding of this study is that bariatric surgery can be safely performed with the necessary precautions in an area with a relatively low infection rate. We have steadily continued with bariatric procedures even through the second UK lockdown (from November 5 to December 3, 2020). As far as we are aware, there have been no reports on outcomes after bariatric surgery during the COVID-19 pandemic. Our cohort of patients had a median age of 51 years and a median BMI of 42.9 with over 75% of patients classed as “severely obese.” Over two-thirds of them had more than one obesity-related comorbidity. In addition, training occurred in almost half the cases. Despite this, complication rates compare favorably with international standards.<sup>25–27</sup>

This study has potential limitations. Observational studies are understandably prone to selection bias. However, this was minimized as we reported a consecutive series of patients prospectively and we followed our usual practice of operating on patients according to their place on our urgent waiting list. There was no additional screening of patients to gauge their suitability for bariatric surgery, outside of the usual tier-3 weight management program. This is a 6-month cohort with adequate follow-up and we felt it was important to report our encouraging outcomes to provide evidence for the resumption of elective bariatric surgery during this phase of the pandemic, with COVID cases continuing to be reported in the community amid ongoing vaccination programs.

There are numerous factors that allowed us to recommence this service safely. Firstly, patients were subjected to early and rapid testing. The relatively low rate of COVID-19 infection in our population meant that our hospital was not overwhelmed with infected cases, thus reducing the risk of in-hospital transmission. There are various ways of measuring the rate of infection and risk of transmission in a population. The reproduction number or R number is the average number of secondary infections produced by one infected person.<sup>28</sup> Although this has limitations in areas with a small number of cases and geographies smaller than at regional level, it can be a guide to aid decision-making for restarting bariatric services. Interestingly nationally reported R numbers for the southwest were consistently less than one during the time period under review. As widespread and increasingly more convenient methods of antibody testing are being implemented, this may prove to be another tool for decision-making in the near future.<sup>29,30</sup>

The definite diagnosis of COVID-19 is based on virus isolation or a positive result of polymerase chain reaction (PCR) test from



sputum, nasal, or throat swabs.<sup>31</sup> Despite the relatively high false-negative rates,<sup>32</sup> we proceeded with performing bariatric surgeries in amber PPE. Given that the patients were from an area with a low local infection rate, were asymptomatic, and had undergone 14 days of self-isolation prior to the procedure, we felt that the risks of missing a true-positive result were minimal. In the initial phase of the pandemic, for the first 8 weeks, intubation of all theater cases in our hospital had been performed in red PPE (visor/goggles, FFP3 face mask, and double gloving) as it was deemed a high-risk aerosol-generating procedure. However, in the following phase when we resumed bariatric surgeries, uniformly good outcomes with our preoperative COVID-19 protocol for urgent elective surgery meant that we were confident to go ahead with amber PPE for intubation as well. This controlled use of resources ensured that PPE was in adequate supply for use in an unequivocally high-risk environment. This also meant that we were able to resume our full operative capacity of five all-day theater lists after 8 weeks.

Bariatric surgery was the first of many procedures to be postponed at the start of the pandemic. The huge backlog of cases that have been generated by the lockdown and the tremendous costs to patient health and well-being make it imperative that we resume bariatric surgery. This patient population constitutes some of the most comorbid patients on our “benign” waiting lists. The separation of patients into having benign disease (including obesity alongside biliary disease and gastroesophageal reflux disease) or cancer is too simplistic and fails to reflect the disease burden faced by the morbidly obese. We believe that policies on restarting surgery should be driven locally while giving consideration to national guidelines. This would entail consideration of a sustained reduction in new cases, availability of rapid testing, adequate PPE, and availability of essential perioperative services.<sup>33</sup> A decision on recommencing bariatric services should be prioritized. A degree of pragmatism and a balanced risk assessment without overthinking minutiae are required and would go a long way in getting this essential service back on track.

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