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Surgical management of obesity: what you need to know

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Abstract

Obesity is a worldwide epidemic and official figures demonstrate a rising prevalence, both in the UK and globally. Increasingly, there is a recognised place for surgical intervention in carefully selected patients, but there is limited understanding of the pathway and process among non-specialist clinicians. This article summarises the available guidelines and literature on the surgical management of obesity for hospital physicians, surgeons and GPs. The focus is on appropriate referral criteria, key bariatric procedures, postoperative management and, most importantly, the complications of surgery and how to recognise them.

Key words: Complications; Education; Gastric band; Gastric bypass; Obesity; Sleeve gastrectomy; Surgery

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Introduction

Obesity is a worldwide epidemic and official prevalence figures are rising annually, both in the UK and globally. The Health Survey for England (NHS Digital, 2019) estimated that in 2019, 28.0% of adults in England were obese (body mass index >30 kg/m^2). Obesity has a causative relationship with many diseases such as type 2 diabetes, cardiovascular disease, cancer, obstructive sleep apnoea and osteoarthritis – all of which are commonly seen in primary and secondary care. The management of these patients requires treatment of coexisting medical conditions, as well as lifestyle modifications to deal directly with the patient's weight. However, there are patients for whom these approaches are insufficient and who benefit from referral to specialist services. Understanding the surgical referral pathway, the procedures available, key complications and basic postoperative management is clearly essential for surgeons, but also just as important for the GPs and hospital physicians who are likely to encounter such patients increasingly frequently.

When to refer

The National Institute for Health and Care Excellence (2016) guidelines refer to the management of obesity within a four-tier system. Broadly speaking, tier one covers general public health promotion, tier two covers specific lifestyle interventions delivered by local community weight management services, tier three involves specialist weight management services, and tier four introduces bariatric surgery. The National Institute for Health and Care Excellence has produced criteria to help guide when referral to tier three services is appropriate (Table 1). Although the NHS Commissioning Board (2013) guidelines for complex and specialised obesity emphasise that an initial referral to tier 3 specialist weight management services (for a period of 12–24 months) should be made before surgery, such services are not universally found around the country.

One of the key National Institute for Health and Care Excellence recommendations over recent years has been a focus on a multidisciplinary team approach to these tier 3 services. The multidisciplinary team should include specialist consultant physicians, dietitians, nurses, psychologists and psychiatrists. A particular issue among obese patients is the increased prevalence of psychiatric disorders such as eating disorders, anxiety and depression (Rajan and Menon, 2017), meaning that close collaboration with primary care and mental health services is essential (Royal College of Physicians, 2013).

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Table 1. Reasons to consider referral to specialist services in obesity	
Referral to tier 3 services should be considered if:	Underlying causes of being overweight or obese need to be assessed
	The person has complex disease states and/or needs that cannot be managed adequately in tier 2
	Conventional weight management treatment has been unsuccessful
	Drug treatment is being considered for a person with a body mass index greater than 50 kg/m^2
	Specialist interventions (such as a very low-calorie diet) may be needed
	Surgery is being considered

Table 2. Bariatric surgery criteria	
Bariatric surgery may be considered as a treatment option for an obese patient if all the following criteria are met:	They have a body mass index ≥40 kg/m^2
	They have a body mass index between 35 kg/m^2 and 40 kg/m^2 and other significant disease (eg type 2 diabetes or high blood pressure) that could be improved with weight loss
	The person has not achieved or maintained adequate, clinically beneficial weight loss, despite application of all appropriate non-surgical measures
	The person is deemed fit for anaesthesia and surgery
	The person can commit to the need for long-term follow up

Surgery remains the gold standard treatment for patients suffering from morbid obesity and the National Institute for Health and Care Excellence (2016) have included further guidelines around which patients would be suitable candidates for surgical management (Table 2).

Surgical management options

Surgeons have been treating obesity for over 50 years and have modified surgical techniques in response to analysis of patient outcomes. The main change to surgical methods over the past 15–20 years has been the increasingly widespread use of laparoscopic techniques – 97.8% of all global primary bariatric operations were performed laparoscopically between 2013 and 2015 (Welbourn et al, 2018). The benefits of these surgeries include less postoperative pain, shorter perioperative hospital admission and faster return to baseline.

The three most commonly performed bariatric operations are sleeve gastrectomy, Roux-en-Y gastric bypass and adjustable gastric banding. Other less commonly performed procedures such as biliopancreatic diversion will not be discussed here. According to a worldwide survey conducted between 2013 and 2015 by the International Federation for the Surgery of Obesity and Metabolic Disorders, the most commonly undertaken surgical bariatric procedure was gastric bypass (49.4%) followed by sleeve gastrectomy (40.7%) and gastric banding (5.5%) (Welbourn et al, 2018). In line with the global data, Roux-en-Y gastric bypass is the most commonly performed operation for obesity in the UK.

Roux-en-Y gastric bypass

Roux-en-Y gastric bypass (Figure 1a) involves three main steps. First, the stomach is divided with the formation of a small pouch. The second step is to divide the jejunum 60–100 cm from the duodeno-jejunal flexure. The alimentary 'roux limb' is then brought up and anastomosed with the newly created stomach pouch. The final stage is to reanastomose the small bowel distal to the excluded stomach and duodenum to the distal part of the roux limb, forming a Y shape with the small intestine. This restructuring of the bowel has a wide array of physiological effects on weight regulation beyond the now outdated concept of merely restricting the stomach's anatomical capacity. Stylopoulos et al (2009) showed

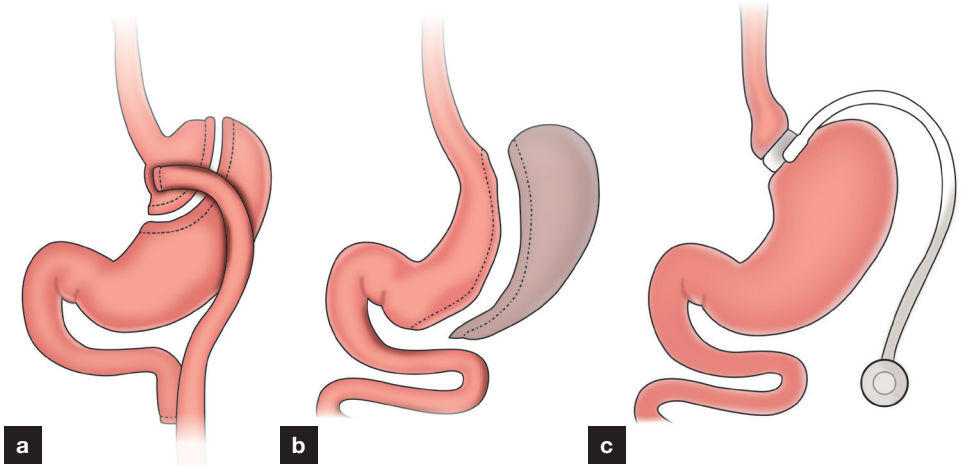

Figure 1. The three most common types of bariatric procedures. a. Roux-en-Y gastric bypass. b. Sleeve gastrectomy. c. Adjustable gastric band.

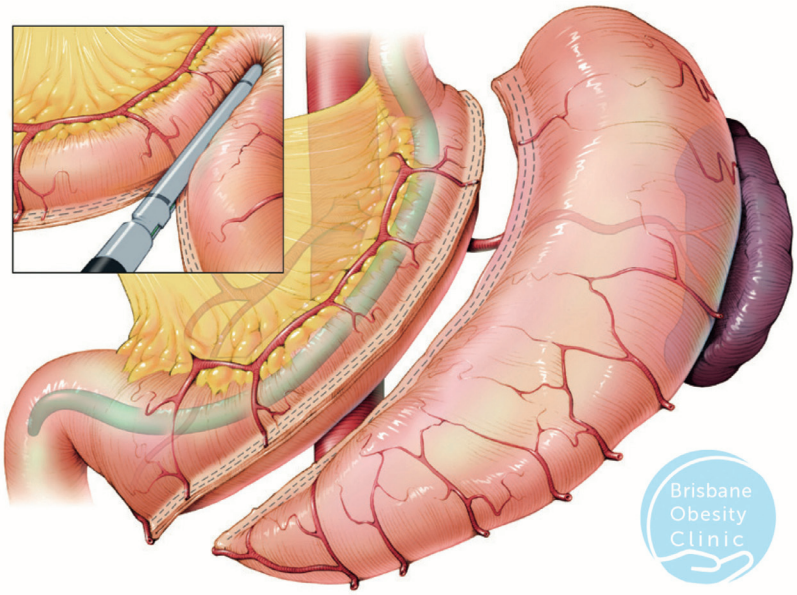

Figure 2. Stapler firing along an intragastric bougie, separating the stomach while simultaneously anastomosing the remainder of the stomach.

that, in rodents, the metabolic reaction to gastric bypass surgery is fundamentally different to the metabolic response to merely the equivalent food restriction.

Sleeve gastrectomy

Sleeve gastrectomy (Figure 1b) involves removal of the fundus and the greater curvature of the stomach, leaving the stomach as a narrow tube. An intragastric bougie is inserted along the lesser curvature and a stapler is used to divide the stomach (Figure 2). The resected part is removed. Sleeve gastrectomy reduces the gastric capacity to 60–100 ml allowing the intake of only a small amount of food per meal (Shi et al, 2010), but also seems to cause attenuation of ghrelin levels, contributing to increased satiety (Karamanakos et al, 2008).

Adjustable gastric band

The third main operation is adjustable gastric banding (Figure 1c). A silicone band is placed at the upper end of the stomach, creating a small pouch that restricts entry and containment of food, as well as reducing appetite. Commonly, the gastric band is adjustable and patients undergoing this form of gastric band will have a small port left under the skin of the abdomen. The band can be adjusted postoperatively by an appropriately trained

healthcare professional by inserting a needle into the port to either inflate or deflate the band, causing a respective decrease or increase in tightness of the pouch outlet.

Meta-analysis has shown that sleeve gastrectomy is comparable with gastric bypass in terms of overall weight loss (Chang et al, 2014). All bariatric operations are safe and have a mortality rate of 0.05%, comparable to a laparoscopic cholecystectomy. The overwhelming conclusion is that bariatric surgery radically improves health for patients with severe and complex obesity (Welbourn et al, 2014).

Postoperative management

Lifestyle changes after the operation must be a key consideration when offering patients a bariatric procedure. Lifelong changes must be strictly followed to reduce the chances of complications, hospital admissions or reoperations. Many patients presenting for surgery already have pre-existing low vitamin and mineral concentrations. The incidence of these may increase postoperatively as all bariatric procedures can potentially cause clinically significant deficiencies. Therefore, preparation for surgery and long-term nutritional monitoring and follow up are essential components of bariatric surgical care (O'Kane et al, 2020).

Immediately post-surgery, patients are usually started on a liquid diet (week one), progressing to a pureed diet (week two). They then move to a soft diet (week three) and eventually return to normal textured food (week four). A regular meal pattern is encouraged. Patients should not drink fluids at or in the 30 minutes either side of meal times as this can promote satiety without achieving recommended calorific intake. Chewing food slowly and thoroughly is vital in patients with gastric bands to avoid large boluses of food obstructing the narrowed outlet and cause blockages. This also reduces epigastric pain post ingestion (Elrazek et al, 2014).

Alongside a balanced diet, the British Obesity and Metabolic Surgery Society encourages lifelong supplementation (for which there are published guidelines – see O'Kane et al, 2020). Individual regimens may vary depending upon initial surgery, baseline nutritional status and blood test results. Follow-up care should remain with the bariatric surgery centre for the first 2 years. Following discharge, lifelong monitoring of nutritional status at least annually should be offered part of shared-care management (O'Kane et al, 2014).

Regular blood tests are key postoperative requirements. Blood levels that are most commonly in need of correction in between routine surgical outpatient appointments are iron and vitamins D and B_{12}. Thiamine deficiency should also be suspected and treated empirically in patients with prolonged vomiting to avoid potentially irreversible symptoms. If the patient is anaemic, then zinc and copper levels should be analysed as these can cause unexplained anaemia (Mechanick et al, 2013).

The immediate pharmaceutical postoperative care of the patient is managed in the hospital by the bariatric team. In the first 4 weeks medication is usually taken in liquid, crushed or suppository form so it is important to liaise with the pharmacist during this period. A proton pump inhibitor is usually prescribed after gastric bypass and sleeve gastrectomy for at least 3 months postoperatively. Most units have their own protocols regarding analgesia and use of low molecular weight heparin post-discharge. Anti-embolic stockings must also be worn until the patient returns to full mobility.

Complications

Patients who have undergone bariatric surgery are at risk of generic postoperative complications, such as deep vein thrombosis, bleeding, hernias and infections and must be monitored for such, but there are also more intervention-specific complications.

Adjustable gastric band

Although initially very safe, the adjustable gastric band may be associated with long-term complications. This has led to a decrease in popularity of this operation in the last decade. Slippage of the gastric band from its original position to lower in the fundus of the stomach may lead to gastric obstruction, and sometimes ischaemia or perforation, necessitating removal. This occurred in 13.2% of patients in a study by Owers and Ackroyd (2013). It initially presents with dysphagia, dyspepsia, epigastric pain, nausea and vomiting. Patients

must be referred urgently to the bariatric centre or the nearest emergency department if slippage is suspected as this usually requires an urgent laparoscopy.

Pouch and/or oesophageal dilatation is a less common complication. It normally presents with gastrointestinal reflux-type symptoms and may occur as a result of an overtight gastric band. Pouch dilatation usually responds to band deflation, although occasionally band removal is required.

Other problems that may occur include erosion of the band into the stomach (10% according to Lattuada et al (2007), but reported as anywhere between 0.3 and 28% by Hota et al (2018)) and subcutaneous port migration/rotation (in around 7% – Van Nieuwenhove et al, 2011). Erosion presents with a loss of feeling of restriction, cellulitis around the port and epigastric pain that radiates to the back. Patients can also have non-specific gastrointestinal symptoms such as nausea, vomiting, reflux symptoms and unexplained weight gain. Diagnosis usually requires gastroscopy and endoscopic or operative removal may be necessary. Issues with the ports may lead to adjustment difficulties, but are usually easily fixed under local anaesthetic.

Gastric bypass and sleeve gastrectomy

Leaks may occur after such surgery. Early postoperative signs of a leak include tachycardia and tachypnoea, but later patients may present with abdominal pain, fever and signs of sepsis. Urgent hospital referral and admission are required in such patients. Clinical suspicion of a leak usually leads to prompt re-laparoscopy as early operative treatment is associated with better patient outcomes (Jacobsen et al, 2014).

These operations may also be associated with 'dumping syndrome' – rapid postprandial gastric emptying characterised by gastrointestinal and vasomotor symptoms. The clinical presentation varies and symptoms are divided into early and late. Early symptoms (1 hour postprandial) include abdominal pain, loose stools, nausea, vomiting and bloating. They can also present with vasomotor symptoms such as fatigue, tachycardia and facial flushing. Late symptoms (1–3 hours postprandial) relate to hypoglycaemia and include perspiration, palpitations, hunger, fatigue, tremor and confusion. Out of 450 patients who had undergone Roux-en-Y gastric bypass or sleeve gastrectomy, one-third (34.2%) reported symptoms consistent with postprandial hypoglycaemia (Lee et al, 2015), so checking blood glucose levels is essential. Most of these patients are reviewed by the multidisciplinary team and dietary changes may be enough to combat the problem, but patients may also be offered medications such as ocreotide and acarbose. If conservative management fails further surgery may be offered.

Figure 3, developed by the British Obesity and Metabolic Surgical Society, provides a helpful traffic light system for categorising the referral urgency for patients who present either to primary care or to the emergency department with some of the above symptoms.

Conclusions

This article has discussed the surgical management of obesity from referral pathway through to surgical techniques, complications and postoperative management. An awareness of this information is important for all clinicians to allow patients to have successful intervention and adequate care, particularly in the postoperative period.

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Conflicts of interest

The authors declare that they have no conflicts of interest.

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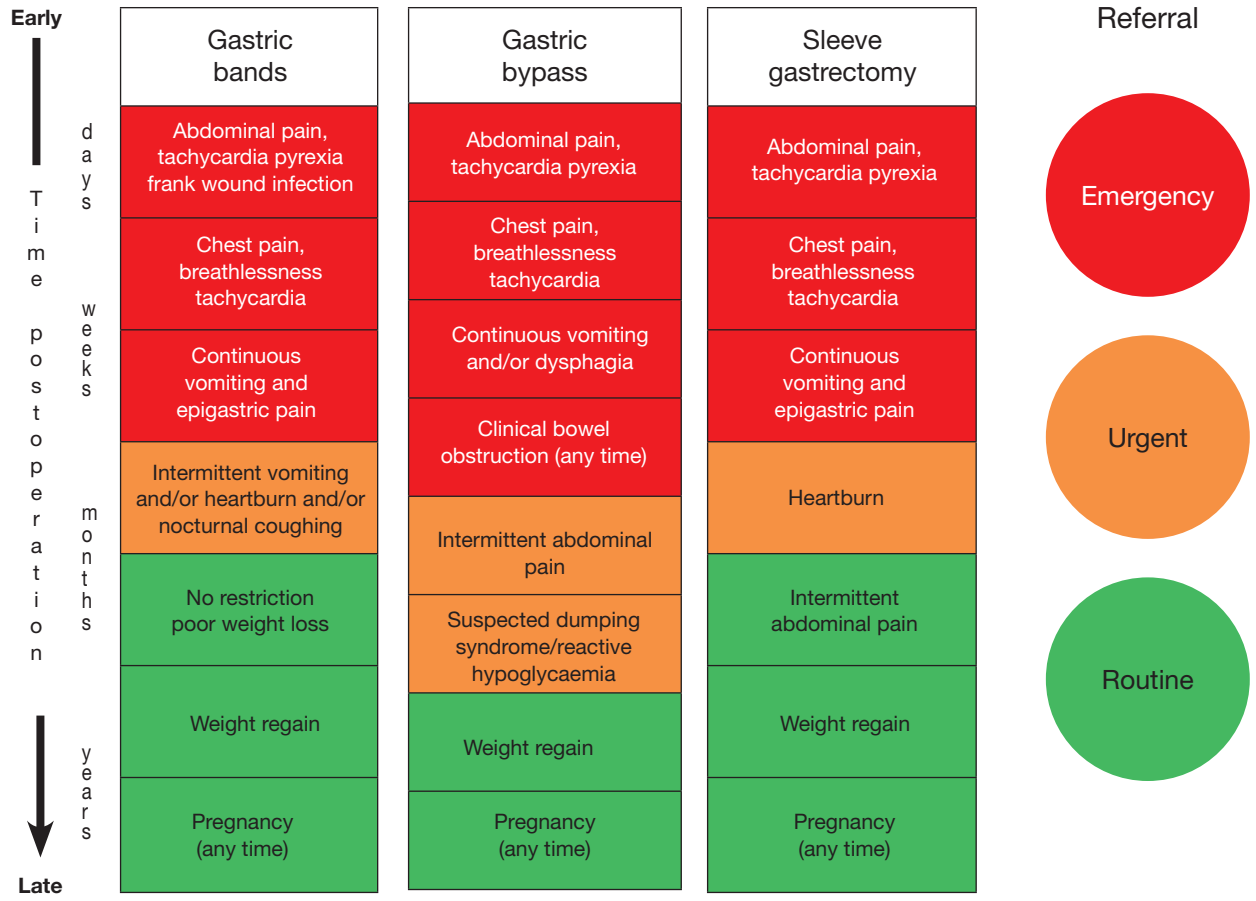

Figure 3. Primary (and secondary) care management of postoperative bariatric patients.

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Key points

- There is a clear pathway in the NHS for referral and management of patients with obesity via a tiered system with a multidisciplinary team focus throughout.
- There are three common operations performed in the UK: Roux-en-Y gastric bypass, sleeve gastrectomy and gastric banding.
- These can all be performed laparoscopically thus reducing the duration of admission and number of postoperative complications.
- These procedures can all lead to significant weight loss within a few years, but each has its own specific advantages and disadvantages.
- Abdominal or chest pain, fevers or vomiting soon after any bariatric surgery should prompt urgent action.

Curriculum checklist

This article addresses the following requirements from the general internal medicine training curriculum:

- Managing an acute specialty-related take
- Managing patients in an outpatient clinic, ambulatory or community setting, including management of long-term conditions
- Managing medical problems in patients in other specialties and special cases.

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