

# Surgery for severe obesity: an effective cure for a difficult problem

<sup>1</sup>P Witherspoon, <sup>2</sup>DJ Galloway

<sup>1</sup>Surgical Registrar; <sup>2</sup>Consultant Surgeon, Gartnavel General Hospital, Glasgow, UK

**ABSTRACT** Obesity levels continue to rise around the world, leading to a multitude of health problems. While many 'medical' attempts at managing obesity have proven ineffective in the long term, some types of surgery for weight control have been shown to result in significant and sustained weight loss. In this article Mr David Galloway and Mr Paul Witherspoon outline the different procedures and their risks and benefits.

**KEYWORDS** Malabsorptive procedures, morbid obesity, restrictive procedures, surgery, weight loss

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A pandemic of obesity is upon us. Worldwide, 1.2 billion people are now overweight, with an estimated 250 million of those classified as obese (Body Mass Index (BMI) >30kg/m<sup>2</sup>).<sup>1</sup> In Scotland, it is estimated that 30% of the adult population will be clinically obese by 2010. Within this group, the proportion of severely obese people (BMI >40) has been increasing rapidly. Obesity is associated with a range of significant co-morbidities, including Type 2 diabetes; hypertension; coronary artery disease; respiratory disease, including sleep apnoea; and a number of cancers.<sup>2</sup> It is associated with increased all-cause mortality, and obese patients have a life expectancy significantly shorter than the national average. The financial burden to the NHS is huge – estimated at 1.5% of the NHS budget – and second only to that caused by smoking.<sup>1</sup> The pattern evident in many Western nations gives rise to serious health concern for children and adolescents, the overweight proportion of whom has gone from 5% to 17.4% in the past 25 years.<sup>3</sup>

It is now clear that sustained weight loss can significantly reduce, and in many cases cure, obesity-related conditions. Unfortunately, despite pharmacological, physical and psychological intervention, 'medical' management of obesity has been shown to be ineffective in the long term with most patients regaining (or exceeding) previous weights.<sup>3</sup> Within this context, bariatric surgery represents a real opportunity for cure for obese patients. It can reliably, and in some cases permanently, reduce both excess body weight and related co-morbidities.<sup>2</sup> With improvements in perioperative care, and especially with the introduction of laparoscopic techniques, surgical intervention can now be performed with very low complication rates.

The recently published National Institute for Health and Clinical Excellence Guideline 43<sup>4</sup> advises that bariatric surgery is now indicated for patients with BMI >40 (or >35 with significant co-morbidity) who have failed all appropriate non-surgical therapies, or with BMI >50 as a

first-line intervention. The importance of the patient's commitment to long-term follow-up is emphasised and vital for a successful outcome.

## TYPES OF PROCEDURES

Morbid obesity operations can broadly be considered as purely restrictive procedures, operations resulting in a degree of malabsorption or procedures designed to combine elements of each approach.

### Restrictive procedures

Restrictive procedures produce a reduction in the functional capacity of the stomach and work not only by physically reducing the amount of food that can be tolerated but also by inducing a sensation of early satiety. Laparoscopic gastric band insertion reduces the stomach to a functional capacity of around 25–50 cm<sup>3</sup> by encircling the upper stomach with an inflatable belt-like device located just below the gastro-oesophageal junction and adjusted via a subcutaneous port. This is currently the dominant operation in this category and the most popular obesity operation outside the US.<sup>6</sup> Other restrictive procedures, such as vertical-banded gastroplasty, create permanent gastric 'pouches' by the use of stapling devices, but these options are now rarely used.

### Malabsorptive procedures

Malabsorptive procedures reduce the functional capacity of the small intestine, thus bypassing a variable amount of small bowel and leaving a short 'common channel' for the absorption of nutrients. The biliopancreatic bypass includes a partial gastrectomy together with the creation of enteric and biliopancreatic limbs that combine into a common channel 1–1.5 m upstream from the ileocaecal valve. This procedure was developed in the 1970s and remains popular in mainland Europe.<sup>7</sup> The duodenal switch procedure, which introduces a modification involving sleeve gastrectomy (a component that is occasionally carried out

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Correspondence to DJ Galloway, Gartnavel General Hospital, 1053 Great Western Road, Glasgow G12 0YN, UK

tel. +44 (0)141 211 3192

e-mail

david.galloway@ggc.scot.nhs.uk

as a first stage), and a division of the duodenum to preserve the pylorus is also practised both in Europe and the US. These procedures are more complex and carry higher operative morbidity and mortality.

### Combined procedures

The most commonly performed combined procedure is the Roux-en-Y Gastric Bypass (RNYGP). It involves the creation of a small proximal gastric pouch with bypass of the remaining stomach, duodenum and a variable length of jejunum, depending on the degree of malabsorption desired. This procedure is the most popular bariatric operation in the US<sup>9</sup> and is now commonly performed laparoscopically.

## OUTCOMES AND RISKS

### Weight loss

The Cochrane Group's review of surgery for morbid obesity has summarised the current evidence for bariatric surgery and concluded that surgical intervention in general results in clinically significant and sustained weight loss for at least eight years with concurrent reduction in co-morbidities.<sup>5</sup> Exact percentage excess body weight losses appear to vary by procedure and study from around 50–75%, but should be seen in stark contrast to the weight gain typical of non-surgical management.

### Mortality rates

Published operative mortality figures are low, varying from 0.1% for laparoscopic banding to 1% for duodenal switch, with morbidity at around 5%.

### Nutritional deficiencies

The malabsorptive procedures can result in long-term vitamin, mineral and protein deficiencies, and, therefore, lifelong follow-up and nutrient supplementation are required. Gastric banding is not associated with these nutritional complications and is readily reversible. It does, however, present its own unique set of complications, including band erosion, slippage, band system failure and subcutaneous port site problems, such as erosion and displacement. Patients with a gastric band may also require long-term follow-up for band adjustment and, in general, require to be more motivated than patients who have undergone a malabsorptive procedure.

## REFERENCES

- 1 Scottish Executive. *Review of bariatric surgical services in Scotland*. Edinburgh: Scottish Executive; 2004.
- 2 Bouldin MJ, Ross LA, Sumrall CD et al. The effect of obesity surgery on obesity comorbidity. *Am J Med Sci* 2006; 331(4):183–93.
- 3 Center for Disease Control and Prevention. *Overweight and obesity: childhood overweight: overweight prevalence*. Available from: <http://www.cdc.gov/nccdphp/dnpa/obesity/childhood/prevalence.htm>
- 4 NICE. *Clinical Guideline 43 – Obesity*. London: NICE, Dec 2006. Available from: <http://guidance.nice.org.uk/CG43>
- 5 Colquitt J, Clegg A, Loveman E et al. Surgery for morbid obesity. *Cochrane Database Syst Rev* 2003; 2:CD003641. Available from: <http://www.cochrane.org/reviews/en/ab003641.html>

## CHOOSING A PROCEDURE

There are a number of different procedures, each with their own proponents, but, importantly, they all result in varying degrees of success. It is said that in broad terms restrictive procedures are good for 'volume' eaters and malabsorptive procedures are perhaps better suited to 'sweets' eaters. In the end, the decision often comes down to individual surgeon–patient assessment and surgical expertise.

The laparoscopic gastric band is the most commonly performed bariatric procedure in the UK. It is the least invasive surgical option and does not involve anatomical reconfiguring of the gastrointestinal tract. Revisional surgery, if required, presents rather less of a challenge than the more complex operations. Although it has been suggested that overall weight loss may be less, the authors' own experience demonstrates highly satisfactory long-term weight loss.<sup>6</sup>

Whatever procedure is used, it is clear that surgical intervention is currently the only available effective therapy for the long-term control of morbid obesity and will become a major weapon in the fight against it. Further high quality randomised trials would be advantageous to aid optimal procedure selection.

## KEY POINTS

- Severe obesity is associated with a range of related diseases.
- Weight control can effectively reverse the influence of these conditions.
- Bariatric operations have their effects by different pathophysiological mechanisms.
- In the UK the most commonly performed operation at present is the laparoscopic adjustable gastric band.
- Procedures that result in malabsorption introduce the requirement for long-term follow-up.
- Bariatric surgery is currently the only available effective and durable therapy for the control of morbid obesity.

- 6 Jenkins JT, Modak P, Galloway DJ. Prospective study of laparoscopic adjustable gastric banding in the west of Scotland. *SMJ* 2006; 50(1):37–41.
- 7 Buchwald H, Avidor Y, Braunwald E et al. Bariatric surgery. A systematic review and meta-analysis. *JAMA* 2004; 292:1724–97.
- 8 Buchwald H. Bariatric surgery for morbid obesity: Health implications for patients, health professionals, and third-party payers. *Surg Obes Rel Dis* 2005; 1(3):371–81.

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