

SURGERY FOR MORBID OBESITY

Scale of the problem

Morbid obesity is internationally defined as a body mass index (BMI) greater than or equal to 40kg/m^2 and also includes those who have a BMI between 35 and 40kg/m^2 with significant co-morbidity that could be improved by weight loss.

Classification	BMI (kg/m^2)
Underweight	<18.5
Healthy weight	18.5-24.9
Overweight	25-29.9
Obese	30-39.9
Morbidly obese	>40

In England and Wales 0.6% of men and 1.9% of women have a BMI of 40kg/m^2 or more. 8% of the population has a BMI of $>35\text{kg/m}^2$. The prevalence of obesity is rising as the average BMI increases – over the last five years by 0.5kg/m^2 for the population.

Obesity is associated with increased morbidity and mortality. There is an increased prevalence of hypertension, type II diabetes mellitus, hypertriglyceridaemia, musculo-skeletal disorders, respiratory and reproductive disorders.

In the morbidly obese the rate of mortality is double that of someone with a healthy BMI at any give age. This excess mortality most commonly relates to the complications of cardiovascular disease and diabetes mellitus. For the morbidly obese mortality is increased five-fold in diabetics. Cancer mortality rates are also increased. For women; cancer of the endometrium (relative risk 5.4), gallbladder (3.6), cervix (2.4), ovary (1.6), breast (1.5). For men; colorectal (1.7), prostate (1.3).

Morbid obesity leads to decreased quality of life due to the social stigma attached and associated prejudice and discrimination. This has a negative impact on productiveness and employment with an increase incidence of psychological disorders. The obese often consider their condition a greater handicap than blindness or deafness.

Obesity has considerable costs for society, both direct in terms of healthcare, and indirect in terms of earnings lost through mortality and sickness. Modest weight loss is associated with substantial benefits especially in reduction of co-morbidity.

Non-operative management

1. Lifestyle intervention

This is the first line intervention for the management of obesity and involves dietetic intervention, increasing physical activity and behaviour therapy. Despite intensive weight management programmes these methods rarely achieve long term weight loss in the morbidly obese sufficient to reduce co-morbidity significantly. Average weight loss at two years is 6% and most patients regain their lost weight at 3-5 years.

2. Drug therapy

Two drugs have been approved in the UK for the treatment of obesity and these should only be used as an adjunct to lifestyle intervention. Average weight loss at two years is 9%. However, continued use of either of these drugs is not recommended beyond one year and weight gain to pre-treatment levels is seen at 4-5 years.

Feature	Orlistat	Sibutramine
Mode of action	Inhibits pancreatic lipase. 30% of dietary fat is not absorbed. Must be used with a low fat diet to avoid symptoms of malabsorption.	Inhibits uptake of noradrenaline and serotonin thereby reducing appetite. May have a minor effect on metabolic rate
Efficacy	2-5 kg more weight loss than placebo.	4-5 kg weight loss at 1 year
Patient eligibility	BMI >28 with co-morbidity or BMI >30 Age 18-75 years Patients should lose 2.5 kg by following a low fat diet in the 4 weeks before stating treatment	BMI >27 with co-morbidity or BMI >30 Age 18-65 years No weight loss required prior to treatment
Contraindications	Chronic malabsorption syndromes, cholestasis, pregnancy and lactation	Hypertension (>145/90), coronary heart disease, psychiatric illness, pregnancy and lactation
Side effects	No appreciable systemic absorption. Steatorrhoea in 25%.	Centrally active drug. Increases blood pressure in some patients. 10% experience constipation, insomnia and dry mouth.

Operative management

Surgical treatment remains the only proven method of sustained weight control for the morbidly obese. Surgical procedures were first introduced in the 1950's with jejuno-ileal and biliopancreatic diversion procedures which both cause weight loss by malabsorption. However, the long term nutritional consequences, including liver and renal failure, are such that neither procedure is in widespread use today. Restrictive procedures and nutritionally acceptable malabsorptive procedures have subsequently been developed which produce effective weight loss with fewer long term consequences.

1. Restrictive

Vertical banded gastroplasty (VBG)

A vertical partition of the upper stomach with staples creating a small (20cc) segment of stomach that fills rapidly with food and then empties slowly. The exit of the pouch is reinforced with a band of Marlex to prevent dilatation.

Adjustable gastric band (AGB)

Placement of a constricting band around the top of the stomach to restrict food intake, creating a narrow passage into the remainder of the stomach. An inflatable balloon incorporated into the band allows the degree of outlet restriction to be adjusted. Functionally very similar to VBG but no staple lines.

2. Malabsorptive

Roux-en-Y gastric bypass (RYGB)

Combines restriction and malabsorption by creating a small gastric pouch (usually by complete transection of the upper stomach) and anastomosis of a Roux loop of jejunum to the pouch thus bypassing the stomach, duodenum and proximal jejunum.

Biliopancreatic diversion

More extensive form of gastric bypass with a greater malabsorptive effect as the bypass is connected to the distal small bowel.

Surgery is indicated in patients with BMI >40, or BMI > 35 with co-morbidity, who have failed a weight management programme. The procedures are now performed laparoscopically, particularly AGB. There is no significant difference in weight loss or complications compared with open procedures. Laparoscopic AGB and RYGB show significant reduction in the proportion of patients requiring an ICU stay, length of hospital stay and time to return to activities of daily living and work.

Morbidity from these procedures is relatively low. Specifically relating to the operation is band slippage or band erosion with laparoscopic AGB. Anastomotic leakage or stomal ulceration may occur with RYGB. Nutritional sequelae are rare with gastric restrictive procedures. RYGB patients are at risk of iron and B₁₂ deficiency as the stomach is bypassed. Vitamin D and calcium absorption may be reduced as the proximal jejunum is also bypassed. Operative mortality is rare (1-2%) and the commonest cause is DVT and PE or cardiac complications.

Weight loss following laparoscopic bariatric surgery usually reaches a maximum at 2 years post-operatively. Mean total weight loss at this time is 26% and, unlike non-operative methods, this is sustained in patients followed for over 5 years. This permanent weight loss has been shown to improve co-morbid conditions including diabetes mellitus, sleep apnoea and hypertension. Other benefits include better mood, self-esteem and improved quality of life.

Overall surgery is cost-effective compared with conventional treatment and laparoscopic surgery is more cost-effective than open surgery. Laparoscopic AGB or RYGB produce significant and sustained weight loss with improvement in physical and psychological health.