



THEME

Weight



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Management of obesity

The role of surgery

BACKGROUND

Obesity is rapidly becoming Australia's biggest health care issue.

OBJECTIVE

This article discusses the role of surgery, in particular laparoscopic adjustable gastric banding, in the management of obesity.

DISCUSSION

The acceptability and uptake of surgery as a solution to obesity has, in the past, been low. This is largely due to the risks of bypass and stapling procedures, as well as the lack of long term efficacy. Laparoscopic adjustable gastric banding has, over the past 13 years, proven not only to be safe, but effective both in terms of weight loss and control of the comorbidities associated with obesity. It is currently the most effective solution we have available for patients who suffer from obesity.

Obesity is rapidly becoming Australia's biggest health problem with about 20% of Australians (approximately 2.6 million) now having a body mass index (BMI) of more than 30.¹ These people are at a much higher risk of many illnesses when compared to normal weight age matched controls. Diseases where obesity is a major contributing factor include type 2 diabetes, coronary heart disease, stroke, hypertension, obstructive sleep apnoea, depression, adenocarcinoma, dyslipidaemia, polycystic ovarian syndrome, nonalcoholic steatohepatitis, and osteoarthritis.² Obesity is now second only to smoking as a preventable cause of death, and in the USA it is estimated that obesity accounts for 14% of all deaths.³

The management of obesity seems like it should be easy. Obesity is a result of caloric intake in excess of energy expenditure, and in simple terms, all any treatment needs to do is reverse that equation. Yet obesity is proving difficult to treat and even more difficult to prevent. Since 1980, the incidence of obesity has doubled in Australia despite an increased awareness of the importance of diet and a healthy lifestyle.

Management

Drug therapy

Drug therapy has proved to be similarly disappointing with a recent meta-analysis of pharmacological treatments showing mean weight loss after 1 year of only 2.9 kg for orlistat and 4.5 kg for sibutramine.⁴ Although modest weight loss such as this has beneficial metabolic effects, for obese individuals these results are suboptimal.

Surgical therapy

Surgical therapies for obesity evolved throughout the 1950s when it was noted that patients with a short gut tended to lose a significant amount of weight. The first obesity (bariatric) procedure performed was a jejuno-ileal bypass. This produced malabsorption of most nutrients as well as profound diarrhoea. Not only was this a morbid procedure with high peri-operative death and complication rates, there were significant long term adverse events such as dehydration, electrolyte imbalance, calcium oxalate renal stones, cirrhosis and protein-calorie malnutrition. These early procedures were subsequently abandoned.⁵⁻⁷

Following on from this early experience, a number of operations, including gastric bypass and biliopancreatic diversion, have been devised. Like the jejuno-ileal bypass, these procedures cause malabsorption of ingested food. They are effective in achieving major weight loss for the severely obese, with patients reliably losing 70–75% of their excess weight.⁵ However, the relatively high rates of peri-operative death (0.5%) and complications (27.5%),⁸ along with the late nutritional side effects and weight regain, have led to a reluctance by patients and their primary physicians to seek these surgical solutions.

Laparoscopic adjustable gastric banding

Laparoscopic adjustable gastric banding (LAGB) is changing the role of surgery in the management of obesity. This procedure involves the laparoscopic placement of an inflatable silicone band at the very top of the stomach leaving a small gastric pouch that fills quickly and empties slowly. This induces a sense of satiety after consuming smaller amounts of food and a feeling of not being hungry. Inevitably, weight loss occurs. Overall, with a good follow up program, patients can expect to lose 50–60% of their excess weight.⁶

Placing a LAGB has proven to be a safe procedure. A systematic review of the published literature has shown a very low risk of peri-operative death (0.05%) or complications (2.6%). This is one-tenth of the risk of gastric bypass.⁸ Generally patients stay in hospital for the day or overnight.

The key to the long term success of this procedure is its adjustability. The balloon of the band is connected to a subcutaneous access port. This allows, by a simple office procedure adding or removing fluid to the system, control of how tight the band is and therefore how much food can be consumed. This tailors restriction to the individual. No other bariatric operation has this flexibility.

For patients who have had a LAGB, there are few nutritional problems following surgery. A nutritionally normal diet should be able to be consumed even though the patient has to adjust emotionally and socially to consuming smaller amounts of food. Weight loss is generally maintained at 0.5–1.0 kg/week. Long term issues relate more to mechanical problems with the band. There is a 5–10% risk of the band prolapsing down the stomach and a 3% chance of the band eroding into the stomach. In addition, the port used to fill the band can leak, or move, and the tubing can crack or break. These problems can generally be managed laparoscopically with minimal effect on long term weight loss or morbidity. Our current re-operation rate is around 5%.^{6,7}

A randomised controlled trial testing the effectiveness of LAGB against an optimal program of medical therapy was recently conducted.¹⁷ Eighty mild to moderately

obese adults (BMI 30–35) were randomly allocated to a medical program of lifestyle change, pharmacotherapy, very low calorie diets, and behavioural modification. The surgical group had LAGB placement. After 2 years, the surgical group had lost 85% of their excess weight. The medical group had lost 21%. There was resolution of the metabolic syndrome in all but one to the surgical group but only a small and nonsignificant change in the medical group. Quality of life was improved in all the eight subscales of the SF-36 measurement system for the LAGB patients. There was equal likelihood of an adverse event for both groups.

Health effects of weight loss following bariatric surgery

Bariatric surgery is not primarily performed for cosmesis. Weight loss after bariatric surgery has an important impact on health and quality of life. The following is a summary of the Center for Obesity Research and Education's studies into the effect of weight loss following LAGB on some of the comorbidities associated with obesity.

Type 2 diabetes

Type 2 diabetes weight loss following bariatric surgery returns two-thirds of patients with type 2 diabetes to normoglycaemia. This effect is sustained and is most powerful when surgery is performed within 2 years of the patient's initial diagnosis.⁹

Hypertension

In a study of 88 patients with hypertension followed for 12 months after LAGB, 59% had normal blood pressure off all treatment, and a further 33% had improved control with less pharmaceutical therapy required.¹⁰

Reflux oesophagitis

Eighty-two patients with moderate or severe reflux oesophagitis were followed for at least 12 months after LAGB, and 89% achieved full control of the disease.¹¹

Asthma

All 33 patients with asthma who were followed for 1 year after LAGB showed improvement, and one-third of these had no episodes of asthma in that time period.¹²

Depression

Two hundred and sixty-two patients with depression were studied before and after LAGB. At 1 year there were major reductions in the severity of depression with 75% of patients assessed to be normal. These results were sustained at 4 years.¹³

Nonalcoholic steatohepatitis

Twenty-one patients with biopsy proven nonalcoholic steatohepatitis pre-operatively were rebiopsied after a weight loss of greater than 33 kg. Nineteen of these patients had complete resolution of the disease.¹⁴

Polycystic ovarian syndrome

Only one of 12 women who had polycystic ovarian syndrome before LAGB showed continuous evidence of the disease at 1 year follow up.¹⁵

Sleep apnoea

A group of 25 patients with obstructive sleep apnoea requiring CPAP were followed after LAGB. Seventy-four percent no longer required CPAP treatment after losing weight.¹⁶

Quality of life

Quality of life, as measured on the Medical Outcomes Trust SF-36 health questionnaire, improves from being abnormally low before surgery to normal at 1 year postoperatively. This effect is sustained at 4 years postoperatively.¹⁰

Indications for surgery

We currently consider patients for bariatric surgery if they have:

- a BMI >35 kg/m²
- identifiable medical, physical or psychosocial problems associated with their obesity, and
- made prolonged efforts to lose weight by nonsurgical means.

Patients with a BMI <35 kg/m² may be considered for surgery when serious comorbidities are present such as type 2 diabetes.⁶

Conclusion

We live in a culture, reinforced by powerful commercial sources, that promotes eating and physical inactivity. Obesity is a serious medical problem carrying with it multiple comorbidities. We must treat obesity as a chronic illness and actively seek to help our patients suffering from this disease. The best option is to encourage patients to lose weight by eating a healthy diet and increasing their level of activity. Unfortunately it is uncommon for this approach to result in durable, meaningful weight loss.

Surgery is currently the most effective and durable way to achieve significant weight loss in obese patients. No surgical procedure is perfect, and all carry inherent risks; however, current data suggest that the risks of surgery are far outweighed by the potential health gains from significant weight loss.

Summary of important points

- LAGB would seem to be the best surgical option currently available.
- Weight loss following LAGB is reliable and durable.
- The procedure is the safest, least invasive, most readily adjustable and, if necessary, most easily reversed of the options currently available.
- Importantly, patients who have had LAGB become not only healthier but happier.

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References

1. Australian Institute of Health and Welfare. Australia's Health 2004. Canberra: AIHW, 2004 (AIHW Cat. No. AUS-44).
2. Australian Institute of Health and Welfare. Heart, stroke and vascular disease – Australian Facts 2002. Canberra: AIHW, 2001 (AIHW Cat. No. CVD-13).
3. Mokdad, AH, Serdula, MK, Dietz, WH. The spread of the obesity epidemic in the United States. *JAMA* 1999;282:1519–22.
4. Padwal R, Li SK, Lau DC. Long term pharmacotherapy for overweight and obesity: a systematic review and meta-analysis of randomised controlled trials. *Int J Obes Relat Metab Disord* 2003;27:1437–46.
5. Karmali S, Shaffer E. The battle against the obesity epidemic: is bariatric surgery the perfect weapon? *Clin Invest Med* 2005;28:147–56.
6. O'Brien PE, Brown WA, Dixon JB. Obesity, weight loss and bariatric surgery. *Med J Aust* 2005;183:310–4.
7. O'Brien PE, Brown WA, Dixon JB. The laparoscopic adjustable gastric band (Lap-Band): a prospective study of medium term effects on weight, health and quality of life. *Obes Surg* 2002;12:652–60.
8. Chapman A, Kiroff G, Game P. Laparoscopic adjustable gastric banding in the treatment of obesity: a systematic literature review. *Surgery* 2004;135:326–51.
9. Dixon JB, Dixon AF, O'Brien PE. Improvements in insulin sensitivity and beta-cell function (HOMA) with weight loss in the severely obese. *Homeostatic model assessment*. *Diabet Med* 2003;20:127–34.
10. Dixon JB, O'Brien PE. Changes in comorbidities and improvements in quality of life after LAP-BAND placement. *Am J Surg* 2002;184:51S–4S.
11. Dixon JB, O'Brien PE. Gastro-oesophageal reflux in obesity: the effect of LAP-BAND placement. *Obes Surg* 1999;9:527–31.
12. Dixon JB, Chapman L, O'Brien PE. Marked improvement in asthma after Lap-Band surgery for morbid obesity. *Obes Surg* 1999;9:385–9.
13. Dixon JB, Dixon ME, O'Brien PE. Depression in association with severe obesity: changes with weight loss. *Arch Int Med* 2003;163:2058–65.
14. Dixon JB, Bhathal PS, Hughes NR, O'Brien PE. Nonalcoholic fatty liver disease: improvement in liver histological analysis with weight loss. *Hepatology* 2004;39:1647–54.
15. Dixon JB, O'Brien PE. Neck circumference is a good predictor of raised insulin and free androgen index in obese premenopausal women: changes with weight loss. *Clin Endocrinol* 2002;57:769–78.
16. Dixon JB, Schachter LM, O'Brien PE. Polysomnography before and after weight loss in obese patients with severe obstructive sleep apnoea. *Int J Obes* 2005;29:1048–54.
17. O'Brien PE, Dixon JB, Laurie C, et al. Treatment of mild to moderate obesity with laparoscopic adjustable gastric banding or an intensive medical program: a randomised trial. *Ann Int Med* 2006;144:625–33.