BARIATRIC SURGERY

Weight Loss Surgery

A variety of surgical procedures to reduce weight performed on people who have obesity.

About Bariatric surgery

Bariatric surgery offers a treatment that can reduce weight, induce remission (the state of absence of disease activity in patients with a chronic illness, with the possibility of return of disease activity) of obesity-related diseases, and improve the quality of life. Weight loss is achieved by reducing the size of the stomach with a gastric band or through removal of a portion of the stomach or by resecting and re-routing the small intestine to a small stomach pouch (gastric bypass surgery). Bariatric surgery is more effective than non-surgical treatments of obesity with a reduction in overall mortality of 30% demonstrated in surgical recipients.

All procedures can be performed laparoscopically (a type of surgical procedure in which a small incision is made, usually in the navel, through which a viewing tube with a small camera is inserted) with a lower rate of complications such as wound infection and incisional hernias. Future trends are attempting to achieve similar or better results via endoscopic (looking inside the body for medical reasons using an endoscope, an instrument used to examine the interior of a hollow organ or cavity of the body) procedures.

Procedures can be grouped in three main categories:

1. Predominantly malabsorptive (a state arising from abnormality in absorption of food nutrients across the gastrointestinal tract) procedures

In predominantly malabsorptive procedures, although they also reduce stomach size, the effectiveness of these procedures is derived mainly from creating a physiological condition of malabsorption.

- Biliopancreatic diversion

Biliopancreatic diversion (BPD) (Pic. 1, 2) or the Scopinaro procedure is a complex of operation. The original form of this procedure is now rarely performed because of problems with malnourishment (a condition that results from eating a diet in which nutrients are either not enough or are too much such that the diet causes health problems). It has been replaced with a modification known as duodenal switch (see below).

2. Predominantly restrictive procedures

Procedures that are solely restrictive (limiting- já nenašia žádné další vhodné synonymum slova omezující) act to reduce oral intake by limiting gastric volume, produce early satiety, and leave the alimentary canal in continuity, minimizing the risks of metabolic complications.

- Vertical banded gastroplasty

In the vertical banded gastroplasty (Pic. 3), also called the Mason procedure or stomach stapling, a part of the stomach is permanently stapled to create a smaller pre-stomach pouch, which serves as the new stomach.

- Adjustable gastric band
The restriction of the stomach also can be created using a silicone band, which can be adjusted by addition or removal of saline through a port placed just under the skin (Pic. 4, 5). This operation can be performed laparoscopically, and is commonly referred to as a "lap band". Weight loss is predominantly due to the restriction of nutrient intake that is created by the small gastric pouch and the narrow outlet. It is considered one of the safest procedures performed today with a mortality rate of 0.05%.

- **Sleeve gastrectomy**

Sleeve gastrectomy (Pic. 6), or gastric sleeve, is a surgical weight-loss procedure in which the stomach is reduced to about 15% of its original size, by surgical removal of a large portion of the stomach, following the major curve. The open edges are then attached together (typically with surgical staples, sutures, or both) to leave the stomach shaped more like a tube, or a sleeve, with a banana shape. The procedure permanently reduces the size of the stomach. The procedure is performed laparoscopically and is not reversible.

- **Intragastric balloon (gastric balloon)**

Intragastric balloon involves placing a deflated (the gas is released) balloon (Pic. 7) into the stomach, and then filling it to decrease the amount of gastric space. The balloon can be left in the stomach for a maximum of 6 months and results in an average weight loss of 5–9 BMI (body mass index) over half a year. The intragastric balloon may be used prior to another bariatric surgery in order to assist the patient to reach a weight which is suitable for surgery, further it can also be used on several occasions if necessary.

- **Gastric plication**

Basically, the procedure can best be understood as a version of the more popular gastric sleeve or gastrectomy surgery where a sleeve is created by suturing rather than removing stomach tissue thus preserving its natural nutrient absorption capabilities. Gastric plication significantly reduces the volume of the patient’s stomach, so smaller amounts of food provide a feeling of satiety. Weight loss outcomes are comparable to gastric bypass.

3. **Mixed procedures**

Mixed procedures apply both techniques simultaneously.

- **Gastric bypass surgery**

A common form of gastric bypass surgery is the Roux-en-Y gastric bypass (Pic. 8, 9), designed to reduce the amount of food a person is able to eat by cutting away a part of the stomach, gastric bypass is a permanent procedure that helps patients by changing how the stomach and small intestine handle the food that is eaten to achieve and maintain weight loss goals. After the surgery, the stomach will be smaller. A patient will feel full with less food.

- **Sleeve gastrectomy with duodenal switch**

A variation of the biliopancreatic diversion (portions of the stomach are removed then the small pouch that remains is connected directly to the final segment of the small intestine, completely bypassing the upper part of the small intestines) includes a duodenal switch (Pic. 10). The part of the stomach along its greater curve is resected. The stomach is "tubulized" with a residual volume of about 150 ml. This volume reduction provides the food intake restriction component of this operation. This type of gastric resection is anatomically and functionally irreversible. The stomach is then disconnected from the duodenum and connected to the distal part of the small intestine. The duodenum and the upper part of the small intestine are reattached to the rest at about 75–100 cm from the colon.

- **Implantable gastric stimulation**
This procedure where a device similar to a heart pacemaker is implanted by a surgeon, with the electrical leads stimulating the external surface of the stomach, is being studied in the USA. Electrical stimulation is thought to modify the activity of the enteric nervous system of the stomach, which is interpreted by the brain to give a sense of satiety, or fullness. Early evidence suggests that it is less effective than other forms of bariatric surgery.

Patient selection criteria for bariatric surgery include body mass index (BMI), the presence of co-morbidities and a history of prior weight loss attempts. National Institute of Clinical Excellence (NICE) and National Institutes of Health (NIH) guidelines state that bariatric surgery should be offered to patients with a BMI of 35 to 40 kg/m² who have obesity related conditions such as diabetes mellitus or obstructive sleep apnea, or in those with a BMI of 40 kg/m² or greater regardless of weight related co-morbidities. Bariatric surgery for individuals with a BMI less than 35 kg/m² with obesity related co-morbidities is under investigation but is not currently recommended.

**Success or failure factors**

If a candidate meets the criteria for surgery, then a multi-disciplinary team assessment is made as to the suitability of the candidate. This is a complex process involving psychological, surgical, dietetic and medical review. The individual must be physically and psychologically fit to proceed to surgery. Expectations must be managed and a determination must be made as to the individual’s ability to comply with post-operative care. The decision to operate will take into account the benefits the candidate is likely to gain, and the risks peri-operatively and post-operatively.

**Complications**

Complications from weight loss surgery are frequent. Common problems are gastric dumping syndrome in about 20% (bloating and diarrhea after eating, necessitating small meals or medication), leaks at the surgical site (12%), incisional hernia (7%), infections (6%) and pneumonia (4%). As the rate of complications appears to be reduced when the procedure is performed by an experienced surgeon, guidelines recommend that surgery be performed in dedicated or experienced units.

Laparoscopic bariatric surgery requires a hospital stay of only one or two days. Short-term complications from laparoscopic adjustable gastric banding are reported to be lower than laparoscopic Roux-en-Y surgery, and complications from laparoscopic Roux-en-Y surgery are lower than conventional (open) Roux-en-Y surgery.

Metabolic bone disease manifesting as osteopenia (a condition in which bone mineral density is lower than normal) and secondary hyperparathyroidism (an excess of parathyroid hormone in the bloodstream due to overactivity of one or more of the body’s four parathyroid glands) have been reported after Roux-en-Y gastric bypass surgery due to reduced calcium absorption. The highest concentration of calcium transporters is in the duodenum. Since the ingested food will not pass through the duodenum after a bypass procedure, calcium levels in the blood may decrease, causing secondary hyperparathyroidism, increase in bone turnover, and a decrease in bone mass. Increased risk of fracture has also been linked to bariatric surgery.

Rapid weight loss after obesity surgery can contribute to the development of gallstones. Adverse effects on the kidneys have been studied. Nutritional derangements due to deficiencies of micronutrients like iron, vitamin B12, fat soluble vitamins, thiamine, and folate are especially common after malabsorptive bariatric procedures.

**Prognosis**

**Weight loss**

In general, the malabsorptive procedures lead to more weight loss than the restrictive procedures; however, they have a higher risk profile.

The maximum weight loss occurs in the first 10 months after surgery.
Reduced mortality and morbidity

In the short term, weight loss from bariatric surgeries is associated with reductions in some comorbidities of obesity, such as diabetes, metabolic syndrome and sleep apnea, but the benefit for hypertension is uncertain. It is uncertain whether any given bariatric procedure is more effective than another in controlling comorbidities. There is no high quality evidence concerning longer-term effects compared with conventional treatment on comorbidities.

Psychiatric/Psychological

Overall improvements in eating behaviors, mood disorders and body image are reported after bariatric surgery, and the mechanism is not enlightened. Risk of suicide and consumption of substances of abuse, especially alcohol, after gastric bypass surgery are problems that clinicians must be aware.

Fertility

Bariatric surgery can have impact on future fertility. In men, obesity can result in erectile dysfunction, reduced serum testosterone levels and reduced sperm quality. Bariatric surgery is associated with increased serum testosterone levels but may paradoxically result in a deterioration in sperm quality.

In women, obesity is associated with high rates of ovulatory dysfunction, increased risk of spontaneous abortion and increased materno-fetal risk in pregnancy. There is evidence that weight reduction via bariatric surgery can improve ovulatory cycles and reduce hyperandrogenism (a medical condition characterized by excessive levels of androgens in the female body) in women. It also probably reduces materno-fetal risk, although the current evidence is mainly limited to observational data. To date, there are no randomized controlled data or long-term prospective data available and, therefore, no strong recommendation can be made on advising reproductively active women considering bariatric surgery.

Find more about related issues

Diagnoses

Obesity
A disease of excess body fat that can have a negative effect on health, leading to reduced life expectancy and other health problems.
Learn more at: www.fertilitypedia.org/therapy/diag/obesity

Polycystic ovary syndrome
A condition in which a woman has an imbalance of female sex hormones. This may lead to changes in the menstrual cycle, cysts in the ovaries, trouble g
Learn more at: www.fertilitypedia.org/therapy/diag/polycystic-ovary-syndrome

Gallery
A 400 mL gastric pouch is formed from the stomach. The small bowel is connected to the gastric pouch to create a Roux-en-Y gastroenterostomy. An anastomosis is performed between the excluded biliopancreatic limb and the alimentary limb.
A band with an inner inflatable silastic balloon is placed around the upper stomach just below where the esophagus joins the stomach. The band is adjusted through access port under the skin by the injection or withdrawal of solution.

The stomach is transected vertically creating a gastric tube and leaving a pouch of 100 to 200 mL.
An illustration of the gastric balloon weight loss procedure where the balloon is placed into the stomach to decrease the amount of gastric space.

An upper gastric pouch and a lower gastric remnant is formed from the stomach. The jejunum is divided and anastomosed to the gastric pouch. The distal jejunum is brought up as a 'Roux-limb'.

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Diagram of a sleeve gastrectomy with duodenal switch.

Sources
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“Bariatric Surgery: Everything You Need to Know (Including What Your Doctor Might Not Be Telling You)” —sourced from Medium

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