



Obesity has reached epidemic proportions.

Bariatric surgery – where do we stand?

Did you know?

6,705

The number of bariatric surgeons worldwide in 2011.¹

Obesity has reached epidemic proportions. Once mainly associated with higher-income countries it is now very prevalent in low- and middle-income countries, too. Worldwide prevalence more than doubled between 1980 and 2014. New alarming figures show that 42 million preschool children in 2013 were overweight or obese.²

Cardiovascular disorders such as coronary artery disease, stroke and hypertension as well as metabolic syndrome, Type 2 diabetes mellitus, musculoskeletal disorders, certain cancers, psychological and psychiatric problems are all associated with obesity and result in higher mortality and morbidity.

Obesity can be prevented as it is a result of a skewed balance between energy intake and energy consumption.

However, quite often non-surgical treatments such as diet and exercise alone are not successful. Thus, bariatric surgery numbers are rising worldwide as more and more people are severely obese. Between 2003 and 2013 the number of bariatric surgeries increased from 150,000 to almost 470,000 annually.^{3,4}

According to several guidelines, bariatric surgery is beneficial for patients with a BMI of 30 to 35 with significant comorbidities and for obese people with a BMI of 35 to 40 and higher with no secondary conditions. Many studies show immense average weight loss in people after bariatric surgery and improvements in secondary conditions such as diabetes mellitus and metabolic syndrome.

What are the most common types of bariatric surgery procedures and in what way are they different?

Bariatric surgery procedures achieve weight loss by limiting the absorption of nutrients and the amount of food which can be eaten at one meal. The most common bariatric surgery procedures are categorised into a) restrictive and b) mal-absorptive procedures or a combination of both. The surgical changes in the anatomy of the gastrointestinal tract can either result in a reduction of the stomach size or they can bypass certain parts of the digestive system or combine both procedures. Worldwide,

¹ Buchwald, Oien, pages 427-36

² WHO Fact Sheet No 31, updated January 2015

³ Angrisani et al, pages 1822-32

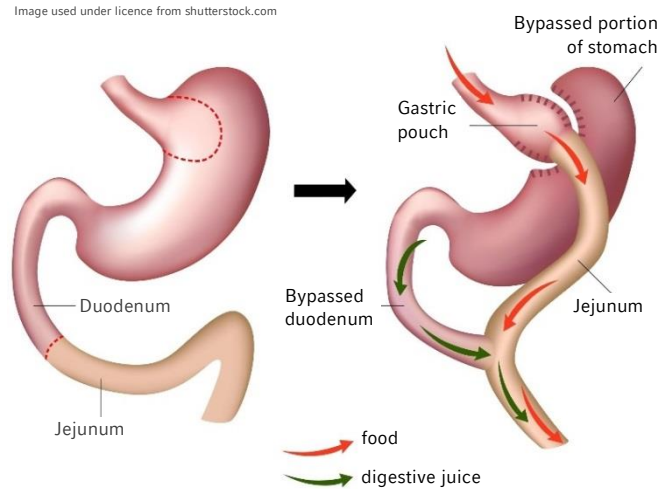
⁴ Buchwald, Oien, pages 1605-11

the most common surgery types are the Roux-en-Y gastric bypass, sleeve gastrectomy and adjustable gastric banding. More than 90% of the globally conducted bariatric surgeries are performed laparoscopically. Careful individual consideration is needed in order to find the most appropriate type of bariatric surgery taking into account the patient's age, general health and comorbidities. Overall, perioperative mortality of bariatric surgeries has decreased to less than 1%.⁵ Additional plastic surgery often has to be applied after the original bariatric surgery.

Roux-en-Y gastric bypass (RYGB): This type of bariatric surgery combines restrictive and mal-absorptive procedures and was first performed laparoscopically in 1993.⁶ It is quite a demanding procedure using the laparoscopic technique, but the hospital stay and recovery time are usually much shorter compared to a classic laparotomy approach.

Roux-en-Y gastric bypass (RYGB)

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Currently the most common procedure in Europe and Latin/South America

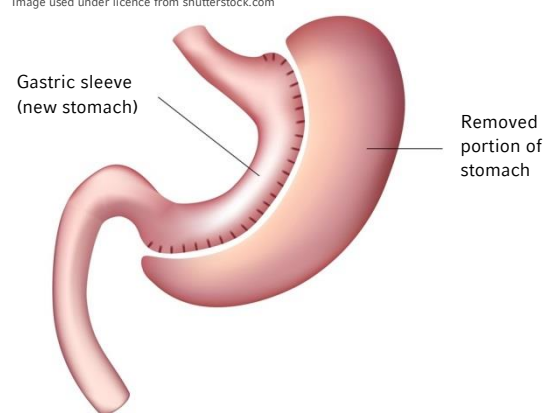
This laparoscopic procedure has been performed in 45% of bariatric surgeries worldwide and the number has not changed much since 2008. It is currently the most common procedure in Europe and Latin/South America.⁷

⁵ Buchwald et al, pages 1724-1737
⁶ Wittgrove, Clark, pages 233-39
⁷ Angrisani et al, 1822-32

Common long-term postoperative complications are dumping syndrome (the food is transferred too quickly into the small intestine causing discomfort and diarrhoea), and vitamin, iron and calcium deficiencies.

Laparoscopic sleeve gastrectomy (LSG)

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Often used for high-risk super-obese patients

Laparoscopic sleeve gastrectomy (LSG) is a relative newcomer to bariatric surgery and is often used for high-risk super-obese patients. The global share of surgery accounted for by this technique increased from 0% in 2008⁸ to 37% in 2014⁹. In the USA, Canada and the Asia/Pacific regions LSG is currently the number one approach. It is a restrictive procedure, where 75% of the stomach is removed without any bypassing of the intestines. The "new" stomach is the size of a banana and limits the amount of food which can be eaten at one meal. This type of surgery requires only a relatively short operation time and is associated with fewer major complications such as revision due to obstruction of the gastric sleeve.¹⁰ Gastroscopy is still possible and only Vitamin B12 is needed as a supplement.

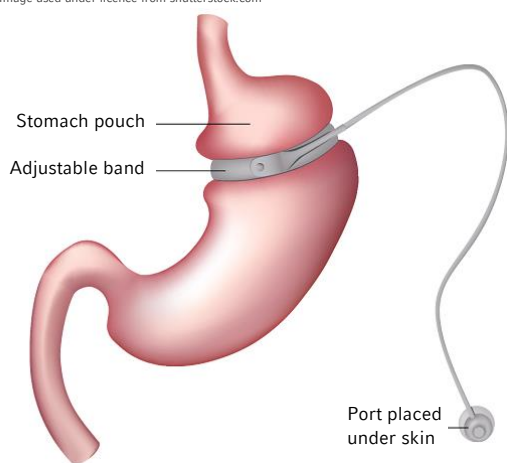
Adjustable gastric banding (AGB): This procedure was the most common up until 2008 (68% globally)¹¹, but its use had decreased to 10% by 2013. It is a restrictive type of bariatric surgery and absorption of nutrients is still possible. The stomach opening size can be adjusted using an inflatable band and a reservoir under the skin (port).

⁸ Buchwald, Oien, pages 427-36
⁹ Angrisani et al, 1822-32
¹⁰ Peterli et al, 690-695
¹¹ Angrisani et al, 1822-32

However, the rate of complications such as band slippage, erosions and reservoir leaks as well as the reduced impact on weight loss compared to other surgical methods resulted in a relative decrease in the use of this method over time.

Adjustable gastric banding (AGB)

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Restrictive type of bariatric surgery

What is the impact on weight loss, mortality and morbidity after bariatric surgery?

Many studies have documented a tremendous short- and long-term average weight loss in operated patients. The Swedish Obese Subjects (SOS) study is currently considered to be one of the most important reference studies regarding long-term effects on mortality and morbidity after bariatric surgery. However, laparoscopic sleeve gastrectomy was not investigated in this study as it is a relatively new bariatric surgery type. The SOS study shows that the peak weight loss occurs one year after surgery regardless of the surgical method.¹²

The SOS study also shows a mean percent weight change during a 15-year observation period with regard to the different types of bariatric surgery. The greatest change in terms of long-term weight loss 15 years after operation was observed in gastric bypass surgery at around 27%, whereas gastric banding showed a change in weight of only around 13%.¹³ Compared to the mortality (adjusted for age, gender and risk factors) of obese non-surgically treated patients, the SOS study shows a mortality reduction in obese patients after bariatric surgery of 30.7%.¹⁴

Since laparoscopic sleeve gastrectomy is a rather new procedure more research activities have been undertaken recently. Results of a long-term study¹⁵ show a remaining weight loss after 5 years of somewhat more than 50%. These results underline the growing importance of this type of bariatric surgery worldwide.

The antidiabetic effect of bariatric surgery and positive changes in metabolism have been observed in many studies. For some patients it is even possible that their diabetes may be cured, but this will depend on how long the diabetes was present before bariatric surgery.

A population-based study¹⁶ of 16,683 patients with a follow-up time of 10 years after bariatric surgery showed a substantial excess of death due to suicide (expected 2, observed 16). Such elevated suicide rates have been observed in more recent studies as well.

Possibly, obese patients may have a higher prevalence of mental illness (which may even be undiagnosed) prior to bariatric surgery, hence leading to a higher suicide rate after operation.

¹² Sjöström et al, pages 741-52

¹³ Sjöström et al, pages 741-52

¹⁴ Sjöström, pages 93-97

¹⁵ Diamantis et al, pages 177-83

¹⁶ Omalu et al, pages 923-28

Underwriting perspective

The overall mortality still remains considerably higher after bariatric surgery when compared to healthy populations, but it is pleasing to observe a reduced mortality compared to obese patients who did not undergo surgical treatment.

From an underwriting perspective we need to look thoroughly at the past obesity duration, the current BMI, past and present comorbidity as well as the type and date of operation, amount of weight loss and psychological problems.

On the disability side, the positive effect of bariatric surgery may be diminished owing to already existing problems with the musculoskeletal system.

Overall, most obese patients benefit considerably from bariatric surgery in terms of weight loss, improvements in comorbidities, mortality and a better quality of life.



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Bibliography

ANGRISANI L.; et al: Bariatric Surgery Worldwide 2013. *Obes. Surg.* 2015 Oct 25 (10), 1822-32. doi: 10.1007/s11695-015-1657-z.

BUCHWALD H., OIEN DM: Metabolic/bariatric surgery worldwide 2011. *Obes Surg*; 2013 Apr; 23 (4):427-36. doi: 10.1007/s11695-012-0864-0.

BUCHWALD H., OIEN DM: Metabolic/bariatric surgery worldwide 2008; *Obesity Surgery* 2009;19(12):1605-1611.

BUCHWALD Henry; AVIDOR Yoav; BRAUNWALD Eugene; et al: Meta-analysis. *JAMA.* 2004;292(14):1724-1737 (doi:10.1001/jama.292.14.1724).

DIAMANTIS Theodoros, et al: Review of long-term weight loss results after laparoscopic sleeve gastrectomy; *Surgery for Obesity and Related Diseases*. Volume 10, Issue 1, Pages 177-183 (January 2014), DOI: 10.1016/j.soard.2013.11.007.

OMALU B., et al: Death rates and causes of death after bariatric surgery for Pennsylvania residents, 1995 to 2004. *Archives of Surgery*, 2007 Oct;142 (10):923-8;

PETERLI, R. et al: Early results of the Swiss Multicentre Bypass or Sleeve Study (SM-BOSS); *Annals of Surgery*, 2013; 258(5): 690-695

SJÖSTRÖM, et al: Effects of bariatric surgery on mortality in Swedish obese subjects. *N Engl J Med*, 2007 Aug 23;357(8):741-52.

SJÖSTRÖM L: Bariatric surgery and reduction in morbidity and mortality: experiences from the SOS study. *International Journal of Obesity* (2008) 32, S93-S97; doi:10.1038/ijo.2008.244.

WITTGROVE AC, CLARK GW: Laparoscopic gastric bypass, Roux-en-Y- 500 patients: technique and results, with 3-60 month follow-up. *Obes Surg.* 2000 Jun;10(3):233-9.

WORLD HEALTH ORGANISATION (WHO). Fact sheet No 311, updated January 2015.