

Bariatric Surgery: An Overview

Sandeep Aggarwal, Aditya P Sharma

Department of Surgical Disciplines, All India Institute of Medical Sciences, New Delhi, India

Abstract: In patients with morbid obesity, the nonsurgical management has a high failure rate leading to frustration among these patients. With increasing weight, physical activity decrease and co-morbidities increase leading to a vicious cycle. Bariatric surgery which aims at gastric size reduction with or without bypass of a part of small intestine leads a significant and sustained weight loss. Most of the patients undergoing weight-loss surgery lose 60-80% of their excess weight within 12 months. Surgery also leads to resolution/improvement in co-morbidities including type 2 diabetes, obstructive sleep apnea, hypertension and others in about 80 of the patients. The surgical procedures are done laparoscopically through small 5mm/10mm incisions and thus patients have less post-operative pain and fast recovery. Patients are up and about few hours after surgery and can be discharged by the third post-operative day. Bariatric surgery is getting popular in India and is growing exponentially.

INTRODUCTION

Morbid obesity has reached epidemic proportions. Severely obese people have a great difficulty in losing weight. Multiple attempts at losing weight through dietary restriction, exercise and medicines are mostly unsuccessful in this population. It has been shown in longitudinal studies that non-surgical treatment of morbid obesity does not lead to any meaningful weight loss.¹ 90-95% of people who lose weight regain all or more of their lost weight.² Thus, surgery is the only effective modality for significant and sustained weight loss. It not only leads to significant and durable weight loss but also in improvement/resolution of diseases associated with obesity including diabetes, hypertension, sleep apnea and osteoarthritis.³ Long-term total mortality after bariatric surgery is significantly reduced, particularly deaths from diabetes, heart disease, and cancer.⁴ Popularity of bariatric surgery can be gauged from the fact that more than 1,40,000 bariatric operations are carried out in United States every year. In India, Popularity of bariatric surgery is increasing as well.

WHAT IS BARIATRIC SURGERY?

At the outset one must understand that the surgery does not involve any removal of fat. It is not same as liposuction. Bariatric surgery involves operating on the stomach alone or along with bypass of a portion of the small intestine in order to create caloric restriction as well as malabsorption. There are three popular operations for treating obesity. They are Roux-En-Y Gastric Bypass (RYGBP), Sleeve Gastrectomy (SG) and Adjustable Gastric Banding (AGB). These procedures are discussed in detail in the next article.

The operations are carried out laparoscopically. Typically there are three 1 cm and two 5 mm incisions on the skin. After surgery, the patient makes a rapid recovery. He/she is able to walk in the same evening as the day of surgery and is fit for discharge in about 2-3 days. The patients are on liquid diet initially for 7-10 days after surgery and gradually the diet is changed to soft or semi-solid for another 2 weeks. The weight loss is gradual (which is desirable). On an average a person loses 4-5 Kg every month after surgery initially. Most persons lose an average of 40-45 Kg over one year. Weight loss is not the only measure of the success of surgery. Bariatric surgery has a positive impact on a number of associated diseases.³ The impact on diabetes is most dramatic. Majority of patients do not require any medicines for diabetes soon after surgery. In fact, if they are given the anti-diabetic medication, the blood sugars can become very low.

Correspondence: Dr. Sandeep Aggarwal, Department of Surgical Disciplines, All India Institute of Medical Sciences, New Delhi, India
e-mail: sandeep_aiims@yahoo.co.in

Such impressive effect on diabetes so soon after surgery has led to growing enthusiasm for possible cure of diabetes using surgery even in people who are moderately obese (BMI 30-35).⁵ Other diseases like high blood pressure, asthma, joint disease, sleep apnea, depression etc also show a significant improvement over a longer period of time.

Bariatric operations cause substantial weight loss, which leads to marked improvement in quality of life. People who were not able to walk few steps before surgery are able to walk a substantial distance after losing weight. One of the myths is that surgery leads to weakness. Nothing could be farther from truth. The patients who have undergone bariatric surgery are more active, have a better quality of life and require less medical care.

Who are candidates for bariatric or obesity surgery

Table 1: Standard Criteria for Bariatric Surgery*

- Age ≥ 18 , ≤ 65 yrs
- BMI >35 with co-morbidities
- BMI > 40
- History of multiple failed dieting attempts
- Acceptable surgical risk
- Commitment to Lifelong follow-up

*Based on National Institute of Health (NIH) Guidelines 1991

Not all obese persons require surgery. The selection is based on calculation of body mass index or BMI. Body mass index or BMI is defined as weight in Kg / height in meters square (Kg/m²). Indications for bariatric surgery include those patients with BMI > 40 (with or without any diseases) or BMI >35 with one or more of associated diseases especially diabetes and sleep apnea. In general, these patients are usually more than double their ideal weight or >50 kgs overweight. In Indian patients, a BMI cut-off which is lower by 2.5 points compared to standard guidelines has been suggested by an expert group meeting held in New Delhi.⁶ This is due to the fact that Indians have abdominal obesity predominantly and tend to develop type 2 diabetes mellitus at a lower BMI when compared to Caucasians. A recent report⁷ by American Society of Metabolic and Bariatric Surgery (ASMBS) has endorsed bariatric surgery even in patients with BMI 30-35 Kg/m² as the non-surgical therapies have a high failure rate even in this group of patients with Class I or mild obesity.

What are the complications of Bariatric surgery?

Like all surgical procedures, complications can occur after bariatric surgery. However the chances of complications are low. The incidence of leaks which is one of the most serious complications is 1-2%. In

general the risks of remaining obese are substantially higher than the small risk of surgical complications. Nevertheless, one should be fully aware of all the possible risks before undergoing surgery. Some of the complications can be serious and life threatening if not detected on time.

Does bariatric surgery lead to nutritional deficiencies?

This depends on the type of operation.. This problem is commoner after gastric bypass surgery, a procedure which leads to malabsorption of food. It is important that one understands the need for postoperative life-long compliance with multivitamins and supplements while opting for gastric bypass surgery. After sleeve gastrectomy, the chances of developing nutritional deficiencies are low. However, long term follow-up studies for sleeve gastrectomy are lacking. Hence nutritional surveillance in the form of regular monitoring of the vitamin levels is required.

To conclude, surgery for morbid obesity is the only method, which

provides long-term weight loss. It leads to improvement and often resolution of diseases associated with obesity. Diabetes gets cured in a large number of patients. Surgery has a favorable impact on overall quality of life. The safety is well established. The complication rates are fairly low and acceptable. With proper counseling, bariatric surgery leads to a successful outcome in majority of the patients.

REFERENCES

1. Sjöström L, Lindroos AK, Peltonen M, et al. Lifestyle, diabetes, and cardiovascular risk factors 10 years after bariatric surgery. *N Engl J Med.* 2004 23;351(26):2683-93.
2. Wadden TA. Treatment of obesity by moderate and severe caloric restriction: results of clinical research trials. *Ann Int Med* 1993;119: 688-693.
3. Buchwald H, Avidor Y, Braunwald E, et al. Bariatric Surgery: A systematic review and meta-analysis. *JAMA.* 2004; 13;292(14):1724-37.
4. Sjöström L, Narbro K, Sjöström CD, et al. Effects of Bariatric Surgery on Mortality in Swedish Obese Subjects. *N Engl J Med* 2007;357(8):741-752
5. Dixon JB, Hur KY, Lee WJ. Etal Gastric bypass in Type 2 diabetes with BMI <30: weight and weight loss have a major influence on outcomes. *Diabet Med.* 2012 Dec. doi: 10.1111/dme.12107. [Epub ahead of print]
6. Misra A, Chowbey P, Makkar BM; Consensus group. Consensus statement for diagnosis of obesity, abdominal obesity and the metabolic syndrome for Asian Indians and recommendations for physical activity, medical and surgical management. *J Assoc Physicians India.* 2009;57:163-70.
7. Bariatric surgery in class I obesity (body mass index 30-35 kg/m²). *ASMBS Clinical Issues Committee. Surg Obes Relat Dis.* 2013;9(1):e1-10.

Bariatric Surgical Procedures

Sandeep Aggarwal, Santosh Anand

Department of Surgical Disciplines, All India Institute of Medical Sciences, New Delhi, India

Abstract: Bariatric surgical procedures involve gastric stapling to reduce the size of the stomach with or without bypass of a variable length of small bowel to induce malabsorption. The surgical procedures can thus be classified as mainly restrictive, mainly malabsorptive or a combination of both. Bariatric surgery does not involve any liposuction or abdominoplasty. The common procedures popular in India are sleeve gastrectomy, roux-en-y gastric bypass and gastric banding. Sleeve gastrectomy is getting increasingly popular as it has been shown to be equivalent to gastric bypass in terms of weight loss and impact on co-morbidities. There are minimal long-term nutritional complications after sleeve gastrectomy.

HISTORICAL PERSPECTIVE

Bariatric surgery is not something new, although it is not more than a decade old in India. Intestinal bypass was the first procedure to be used to induce malabsorption and weight loss at University of Minnesota in United States in year 1954.¹ However complications like bacterial overgrowth and renal oxalate stones led to its failure. Later, gastric bypass was started at University of Iowa in 1966. This operation originated from the fact that Billroth II gastrectomy, used for peptic ulcer disease, caused weight loss as an undesirable side-effect. Dr Scopinaro designed an operation called Bilio-Pancreatic diversion (BPD) in 1979.² This operation involved two parts- creation of smaller stomach and bypass of a large portion of small intestine to create a lot of malabsorption. Later, restrictive operations, which did not involve any malabsorption, were started. Vertical banded gastroplasty (VBG) was introduced in 1980 by Dr Edward Mason³ and gastric banding was started in 1986 by Dr Kuzmak⁴. VBG is no longer used and gastric banding's popularity is also on the wane. Sleeve gastrectomy was initially a part of a more complex operation and it was also used as a first step of a staged operation in super-obese (BMI>50 Kg/m²) patients. However, it was seen that a number of these patients did not require the second stage operation. Thus sleeve gastrectomy has become a standard stand-alone weight loss procedure over last decade.⁵ It has been popularized by Michel

Gagner. The exponential growth of bariatric surgery is attributable to the use of laparoscopy in these procedures. The first laparoscopic gastric bypass was done in 1993 by Dr Wittgrove and Dr Clarke from USA.⁶ Other important landmarks include introduction of banded gastric bypass by Dr Mal Fobi in which a band/ring is placed around the gastric pouch to prevent stretching of gastric pouch and ensure durability of weight loss.

STANDARD BARIATRIC SURGICAL PROCEDURES

The standard bariatric surgical procedures⁷ include the following:-

1. Sleeve Gastrectomy (SG)
2. Roux En Y Gastric Bypass (RYGBP)
3. Adjustable Gastric Banding (AGB)
4. Bilio-Pancreatic Diversion (BPD)
5. BPD with duodenal switch (BPD-DS)

These procedures can be classified into the following categories:-

- **Restrictive:** Sleeve Gastrectomy (SG); Adjustable Gastric Banding (AGB)
- **Malabsorptive:** Bilio-Pancreatic Diversion (BPD), BPD with duodenal switch (BPD-DS)
- **Mixed (Restrictive + Malabsorptive) :** Roux En Y Gastric Bypass (RYGBP)

For Indian obese patients, SG, RYGBP and AGB are the three