International Journal of Pharmaceutical Drug Design
IJPDD, Vol.-1, Issue-6 (May, 2024)
ISSN: 2584-2897
Website: https://ijpdd.org/

Review

AN OVERVIEW ON BARIATRIC SURGERY

Sourabh Mahajan*, Shiv Hardenia, Dinesh Kumar Jain

IPS Academy College of Pharmacy, Rajendra Nagar, A.B. Road, Indore, 452012, Madhya Pradesh, India.

Article History

Received: 22/04/2024
Revised : 10/05/2024
Accepted : 22/05/2024

DOI:
10.62896/ijpdd.1.6.9

Abstract:

This abstract provides a comprehensive overview of Bariatric Surgery, a transformative medical intervention for individuals struggling with obesity. The discussion encompasses the manifold benefits of Bariatric Surgery, elucidating its profound impact on weight loss, metabolic health, and overall well-being. The diverse array of Types of Bariatric Surgery is explored, offering insights into the various surgical approaches tailored to individual patient needs. The abstract delves into the intricacies of the Surgical Procedure and Techniques employed in Bariatric Surgery, shedding light on the advancements in minimally invasive techniques that enhance patient recovery and reduce postoperative complications. A critical analysis of Short-term and Long-term Outcomes follows, elucidating the immediate effects on weight loss, resolution of comorbidities, and sustained improvements in quality of life. Notably, the abstract emphasizes the importance of multidisciplinary collaboration in achieving holistic patient care and long-term success.

Keywords: *Bariatric Surgery, Obesity, Surgical Techniques, Long-term Outcomes.*

***Corresponding Author**
Sourabh Mahajan
IPS Academy College of Pharmacy, Rajendra Nagar, A.B. Road, Indore, 452012, Madhya Pradesh, India.
Email: mahajan100rabh@gmail.com

1. INTRODUCTION

A medical technique called bariatric surgery is intended to help obese people lose a large amount of weight and improve their health. It alters your digestive system to aid in weight loss. When diet and exercise have failed or when you are experiencing major health issues as a result of your weight, bariatric surgery is performed. A therapeutic invasive technique addressed to the gastrointestinal system called bariatric surgery helps people with obesity lose weight and improves their metabolic health.[1]

Currently, bariatric (or weight loss) surgery is the most efficient approach to decrease weight and has the highest rates of long-term weight maintenance. One of the most prevalent and chronic diseases in the world, obesity is a life-limiting condition that is accompanied by a number of co-morbidities. Currently, 650 million persons worldwide are thought to be obese, with more than two thirds of Americans being overweight (BMI 25 kg/m2) and over one third being obese (BMI 30 kg/m2). [2]

Patients who are pre-obese or obese may benefit from bariatric surgery by losing weight and experiencing an improvement in their quality of life and health. Bariatrics is concerned with the prevention and control of obesity and related comorbidities. Nearly 9,000 bariatric surgeries were carried out in the UK year 2009–2010, according to the First National Bariatric Surgery Registry report, which was released in April 2011 (The United Kingdom Bariatric Surgery Registry 2011). Data revealed that at the time of operation, 27.9% of patients had type 2 diabetes, 16.5% were getting sleep apnoea medication, and 69% had some functional impairment, such as being unable to ascend flights of stairs without stopping to rest [3].

2. BENEFITS OF BARIATRIC SURGERY

2.1 Significant weight loss

With the use of bariatric surgery, patients may have substantial weight loss and a healthier body mass index (BMI). By reducing the stomach's storage capacity, bariatric surgery helps you feel full much faster than you would without it.

2.2 Improved obesity related health conditions

The treatment of conditions like type 2 diabetes, high blood pressure, sleep apnea, and joint discomfort can be achieved by bariatric surgery.

2.3 Enhanced Quality of life

Patients experiences enhanced mobility, more vitality, a favorable impact on their mental health, and a better perception of their bodies.

2.4 Increased life span

Bariatric surgery has been linked to a lower risk of early death from diseases related to obesity.[4]

3 TYPES OF BARIATRIC SURGERY

The most popular bariatric surgeries, which are best carried out by qualified surgeons working in reputable surgery facilities. The American College of Surgeons (ACS) and the American Society for Metabolic and Bariatric Surgery (ASMBS) have a national unified program called the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) that allows surgery centers to be accredited for quality standardization.

3.1 Gastric bypass Surgery

Roux-en-Y gastric bypass (RYGB), also known as gastric bypass. It was first described by Mason and Ito in the middle of the 1960s. It is now carried out laparoscopically. Roux-en-Y gastric bypass surgical procedure in which the stomach is divided into small proximal gastric pouch (approximately 15-20cc) which is about the size of an egg, leaving a "bypassed" gastric remnant in place. Bypassing the gastric remnant, the entire duodenum, and a section of the proximal jejunum, the proximal gastric pouch is connected to a short bowel segment known as the "roux" jejunal limb. A jejunostomy connects the residual duodenum/jejunum limb (pancreatobiliary limb) to a more distal portion of the jejunum. The average hospital stay is 1-4 days, and the average recuperation time is 3-5 weeks.[5]

Roux-en-Y gastric bypass has some drawbacks, such as:

1. Inadequate surgical candidate
2. A serious mental illness
3. Crohn's disease
4. Inability to tolerate general anaesthesia
5. Pregnancy
6. Addiction to drugs or alcohol
7. Untreated gastric ulcer
8. The patient shows signs of being unable or unwilling to adhere to long-term recommendations.

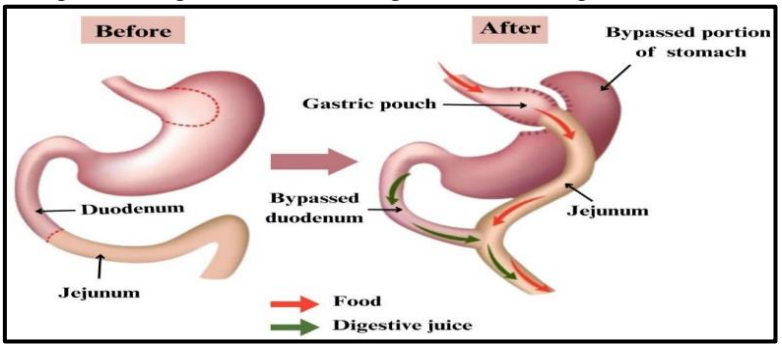

Fig 1 Gastric bypass Surgery

3.1.1 Risk and complications

- Nausea/Vomiting
- Dehydration
- Nutritional deficiencies (especially in vitamins and minerals like vitamin B12, iron, and calcium)
- Gallstones
- Depression
- Gastrointestinal obstruction
- Gastrointestinal bleeding
- Acute gout exacerbation
- Anastomotic leaks

- Infection
- Cardiac dysrhythmias
- Atelectasis and pneumonia
- Deep vein thrombosis
- Pulmonary emboli

3.1.2 Advantages of Roux-en-Y gastric bypass surgery

- Rapid initial weight loss.
- greater average total weight loss observed compared to other bariatric treatments.
- It's possible to use a minimally intrusive method.
- A patient's excess body weight will be lost in two thirds of cases.
- Patients will only reach their target body weight in one-third of cases.
- Type 2 diabetes and other co-morbidities could considerably improve.

3.1.3 Disadvantages of Roux-en-Y gastric bypass surgery

- The gastrointestinal (GI) tract has been stapled off in places where evaluation cannot be performed.
- Nutritional deficits can lead to medical issues, but these are very rare (for example, vitamin B12, iron, and calcium shortages).
- Hair loss is possible but treatable.
- The stomach's remaining size cannot be changed.
- It is really challenging to undo the process.
- After two years, a slight weight gain might happen.
- higher mortality rate compared to laparoscopic adjustable or vertical gastric banding, two other bariatric surgeries.[6]

3.2 Sleeve Gastrectomy

The Laparoscopic Sleeve Gastrectomy was first identified 15 years ago in patients with severe obesity (BMI >50 kg/m2). It is also referred to as a vertical sleeve gastrectomy.[7]

Vertical Sleeve Gastrectomy (VSG) is a surgical technique where the stomach is reduced to about 25% of its original size by the surgical removal of a significant piece of the stomach along the larger curvature, resulting in a thinner sleeve or tube-like structure or like shape of banana. In general Patients who receive VSG typically stay in the hospital for 1-2 days. Sometimes, stays are less than 24 hours when performed in an outpatient or observation surgical center. About two to three weeks are needed for recovery.[8]

The VSG is contraindicated in the following situations:

- inadequate candidate for surgery
- severe mental illness
- Intolerance to general anaesthesia
- addiction to drugs or alcohol
- stomach ulcer that is untreated
- Oesophageal Barrett's
- Achalasia
- Gastrectomy previously

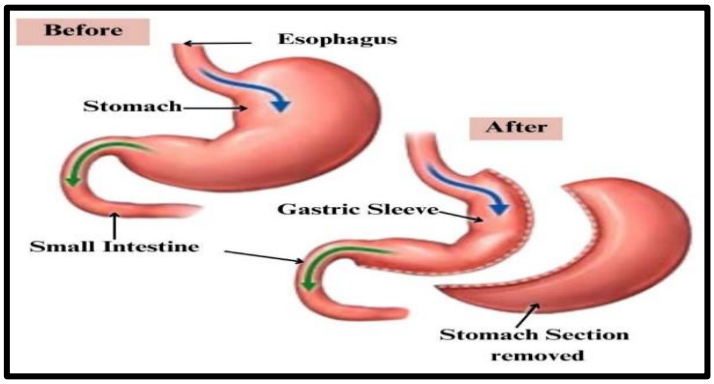

Fig 2 Sleeve Gastrectomy

3.2.1 Risk and Complications

- Nausea and vomiting
- Hydration loss
- Blockage in the digestive system
- Bleeding from the gut
- Nutritional deficiency
- Gallstones
- Depression
- Leaking staple lines
- Infection
- Gastroesophageal reflux disease (GERD)
- cardiac irregularities
- Pneumonia and atelectasis

3.2.2 Advantages of Sleeve Gastrectomy

- Effective weight loss: LSG can provide substantial and long-lasting weight loss. Patients frequently lose more than 50% of their excess body weight within the first year following surgery, which is a significant amount.
- Reduced Appetite: The surgery shrinks the stomach, which may cause a reduction in appetite because ghrelin, the hormone that stimulates hunger, is produced less frequently.
- Nutritional Deficiencies: Because LSG doesn't require bypassing or rerouting the intestines, it often has fewer nutritional nutrient inadequacies problems than some other bariatric procedures.
- Lower Risk of Ulcer: Compared to gastric bypass surgery, LSG has a lower risk of ulcers.
- Lower Risk of Malabsorption: LSG protects the regular digestive process, reducing the danger of nutrient malabsorption.

3.2.3 Disadvantages of Sleeve Gastrectomy

- Irreversible: LSG is irreversible; once the stomach has been opened up, it cannot be put back together again.
- Potential for Long-Term Weight Regaine: Although LSG is effective in the short term, some patients might experience weight regain in the long run, particularly if they don't make long-term lifestyle changes.
- Strict Dietary Restrictions: To prevent problems and encourage weight loss, patients must follow a rigorous postoperative diet. For some people, this may be difficult.
- Initial Postoperative Discomfort: Patients may endure pain, discomfort, and nausea in the early stages of their recovery from surgery. [9]

3.3 Adjustable Gastric Banding

Adjustable Gastric Banding is also known as Laparoscopic Adjustable Gastric banding (LAGB). In 1993, Belachew et al. published the first description of the laparoscopic implantation of an adjustable gastric banding (LAGB). It is a surgical procedure in which the upper stomach is wrapped in an adjustable band to form a small pouch. Through the percutaneous administration of saline through a subcutaneous port, which is accessed in the upper abdomen, the band diameter can be changed. You will feel satisfied with less food because of the small stomach pouch. This will facilitate weight loss. An adjustable gastric band is a silicone device that is placed around the top of the stomach to restrict how much food a person can eat. If you are extremely obese and have a body mass index (BMI) of 40 or above, your doctor might suggest LAGB. Additionally, if your BMI is between 35 and 40, your doctor might suggest it.[10]

LAGB contraindications include:

- A poor candidate for surgery
- Extreme psychological illness
- Inability to tolerate general anesthesia
- Being pregnant
- Addiction to booze or drugs

- Barrett's disease, a severe case of GERD, or an untreated gastric ulcer
- Autoimmune illness

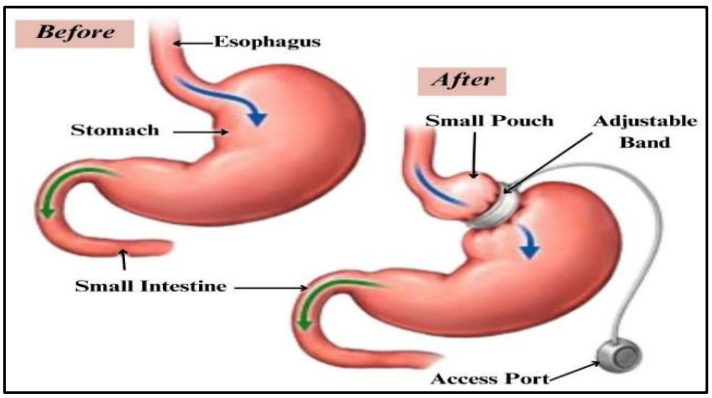

Fig 3 Adjustable Gastric Banding

3.3.1 Risk and complications of LAGB

- Vomiting and nausea
- Dehydration
- Band too tight with gastrointestinal obstruction symptoms (such as dysphagia)
- Hemorrhage
- Gastrointestinal bleeding
- Infection
- cardiac irregularities
- Atelectasis and pneumonia
- Deep vein thrombosis

3.3.2 What takes place during LAGB?

- Typically, a LAGB procedure lasts 30 to 60 minutes.
- During the surgery, you will be completely unconscious.
- You won't feel any discomfort as a result, and you'll sleep through the procedure.
- Your doctor will do a laparoscopy. In your upper belly, he or she will make a number of tiny incisions. The surgeon will next use a laparoscope and tiny surgical instruments to make these incisions.
- The surgeon will create a small stomach pouch by wrapping an adjustable gastric band around your upper stomach and then tightening it.
- Under the skin of your belly, the surgeon will insert a tiny port. The band and the port are joined by a tube.[11]

3.3.3 Advantages and Disadvantages of Laparoscopic Adjustable Gastric banding (LAGB)

Advantages

- Comparing this bariatric operation to others, it has lower mortality and surgical complication rates.
- Less intrusive than other bariatric surgeries.
- No intestinal or stomach stapling is necessary.
- Pregnancy and other nutritional requirements might alter the size of the stomach pouch and outflow.
- The process is reversible.
- Little chance of malnutrition.
- Compared to other bariatric operations, there is less surgical stress, pain, problems, and scars.
- Quicker healing and shorter hospital stays.

Disadvantages

- Compared to other bariatric surgeries, the initial weight loss is slower and less consistent.
- For best effects, follow-up is essential on a regular basis.
- Medical equipment needs to be implanted.
- If the band slips, the procedure's effectiveness can be compromised.
- The access port can leak, necessitating a quick operation.

- Gastric erosion, oesophageal dilatation, and port site infection are possible complications.
- Gallstone development and unhealthy eating habits are examples of longer-term problems.[12]

3.4 Bilio-Pancreatic Diversion with Duodenal Switch (BPD/DS)

The Bilio Pancreatic Diversion with Duodenal Switch (BPD/DS) is a sophisticated and remarkably successful surgical treatment used to treat severe obesity, often known as morbid obesity. In 1979, Scorpinaro published the first account of the biliopancreatic diversion.[13] Generally, this surgery is advised for those with a body mass index (BMI) of over 50.

The following anatomical surgical procedures are performed during the BPD/DS:

1. Sleeve gastrectomy
2. Ileoileal anastomosis
3. Duodenoileal anastomosis
4. Severing a piece of the small intestine proximally at the level of the duodenum and distally at the level of the ileum.

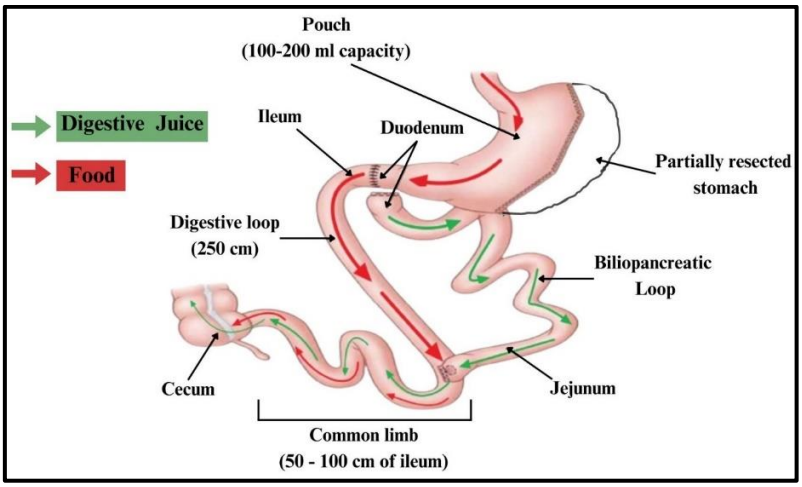

Fig 4 Bilio-Pancreatic Diversion with Duodenal Switch

3.4.1 Restrictive Component:

- In the first stage of the treatment, the surgeon removes a sizable section of the stomach to produce a tiny, sleeve-shaped stomach. This limits the quantity of food that can be consumed.
- The capacity for food ingestion is greatly reduced because the remaining stomach has the shape of a thin tube or a banana. In addition to lowering calorie intake, this limitation encourages early satiety.

3.4.2 Malabsorptive components:

- In order to reduce nutrient absorption, the second step of the process entails rerouting a sizable amount of the small intestine.
- The first segment of the small intestine, the duodenum, is cut off, and the remaining stomach is joined straight to the ileum by the surgeon. This avoids a sizable portion of the small intestine, where nutrition absorption usually takes place.
- Because of this malabsorptive feature of BPD/DS, less calories and nutrients are absorbed by the body.

Patients who have this operation often stay in the hospital for 2-4 days, and the healing process takes 2-4 weeks. BPD/DS contraindications include:[14]

- A poor candidate for surgery
- Extreme psychological illness
- Crohn's illness
- Inability to tolerate general anaesthesia
- Pregnancy
- Addiction to drug or alcohol
- Unattended stomach ulcer
- Extreme GERD
- Rheumatoid bowel syndrome

4 PATIENTS SELECTION CRITERIA

Bariatric surgery patient selection criteria are crucial to ensuring that those receiving the treatment are likely to benefit from it while reducing potential dangers. There are common parameters that the majority of surgeons take into account, although these criteria may differ slightly based on the exact kind of bariatric surgery (e.g., gastric bypass, sleeve gastrectomy, adjustable gastric banding). For advice on the best course of action and eligibility requirements for your particular circumstance, speak with a healthcare expert.

If all the following criteria are satisfied, National Institute for Health and Care Excellence (NICE) 2006 advises bariatric surgery:

- The patients has a substantial illness, such as type 2 diabetes or high blood pressure, and a BMI of 40 or higher, or between 35 and 40, which might be addressed by weight loss.
- All relevant non-surgical option has been explored, but none have been successful in helping patients lose enough weight to be clinically useful for at least six months.
- The patient has been getting intensive management from a specialized obesity service or will being receiving it soon.
- The person is normally healthy enough to undergo surgery and anaesthesia.
- The patient is aware that ongoing monitoring is necessary.[15]

The following are some general standards for choosing candidates for bariatric surgery:

4.1 Body Mass Index (BMI) Guidelines

Body Mass Index (BMI) is a straightforward numerical calculation that evaluates a person's body weight in relation to their height. It's a commonly used method for swiftly classifying a person's weight status and assessing whether they fall into the underweight, normal weight, overweight, or obese categories. BMI has limits when used to determine an individual's health since it does not account for variables like muscle mass, bone density, or body composition. However, it is beneficial for population-level health evaluations and research. However, it continues to be a helpful screening tool for locating possible weight-related health problems.

4.1.1 The BMI is interpreted as:

The result of employing the method to determine your BMI falls into one of several categories, each of which represents a particular degree of body weight:

1. Underweight: BMI less than 18.5
   These people may be at risk for health issues, including dietary deficits and weaker immune systems, that are connected to being underweight.
2. Normal Weight: BMI between 18.5 and 24.9
   This weight range is regarded as healthy since it has a decreased risk of obesity-related health problems.
3. Overweight: BMI between 25 and 29.9
   People who are overweight are more likely to develop diseases including heart disease, diabetes, and high blood pressure.
4. Obesity (Class I): BMI between 30 and 34.9
   This is the least severe kind of obesity, and health issues are more likely.
5. Obesity (Class II): BMI between 35 and 39.9
   People who fall into this category are much more likely to experience obesity-related health problems.
6. Obesity (Class III - Morbid Obesity): BMI of 40 or higher
   This is the most extreme kind of obesity and is linked to a very high risk of several illnesses, such as heart disease, type 2 diabetes, sleep apnea, and joint difficulties.[16]

The BMI standards for bariatric surgery assist in determining if a person is a good candidate for weight reduction surgery. BMI is a measurement that is derived from a person's height and weight and is used as a screening tool to determine their level of obesity. a broad overview of BMI requirements for typical bariatric operations, while different types of bariatric surgery could have somewhat varying BMI criteria:

1. Higher (BMI of 40 or Morbid Obesity):
   Generally, those who have a BMI of 40 or more are eligible for bariatric surgery, regardless of the existence of health issues caused by obesity. Obesity at this stage is frequently referred to as "morbid obesity."
2. BMI between 35 and 39.9 with Obesity-Related Health Problems:

Generally, those who have a BMI of 40 or more are eligible for bariatric surgery, regardless of the existence of health issues caused by obesity. Obesity at this stage is frequently referred to as "morbid obesity."

3. Lower BMI with extraordinary health issues:
   In some circumstances, people with a BMI under 35 may be given consideration for bariatric surgery if they have extraordinary obesity-related health issues that are not sufficiently managed by non-surgical treatments.
4. BMI Below 30:
   The majority of bariatric surgery recommendations advise against operating on patients who have a BMI below 30 since the hazards may exceed the possible advantages. Focusing on dietary adjustments, exercise, and lifestyle modifications may be more beneficial for these people.[17]

Table 1 A broad recommendations for a few popular bariatric procedures depending on BMI categories may be seen below

5. Bariatric procedures	BMI range (approximate)
Gastric Banding	BMI 30-40
Sleeve Gastrectomy	BMI 30-40
Roux-en-Y Gastric bypass	BMI 35-40 or BMI 30-34.9 with obesity related health problems
Biliopancreatic Diversion with Duodenal switch (BPD/DS)	BMI 50 or higher or BMI 40-49 with obesity related health conditions

4.2 Health Conditions and Comorbidities

However, not every person who is fat or overweight qualifies for bariatric surgery. Candidate requirements often include having a body mass index (BMI) of 40 or more or a BMI of 35 or higher with serious obesity-related health issues. These ailments, often referred to as comorbidities, frequently have a significant impact on whether a person qualifies for bariatric surgery. [18]

Table 2 The following provides comprehensive details on typical comorbidities linked to obesity and how bariatric surgery may affect them:

Type 2 Diabetes (T2D)	• Obesity is a significant risk factor for T2D development. • Significant improvements in blood sugar regulation may result after bariatric surgery. • After surgery, some patients' T2D goes into remission, potentially lowering or eliminating the requirement for diabetic drugs.
Hypertension (High Blood Pressure)	• Obesity and hypertension are strongly related, which raises the risk of heart disease, stroke, and other cardiovascular issues. • Blood pressure can be significantly lowered after bariatric surgery. • Many people might be able to use less or no antihypertensive medication.
Hyperlipidemia (High Cholestrol)	• High levels of triglycerides and cholesterol in the blood are frequently caused by obesity, which raises the risk of heart disease. • Lipid profiles can be normalized,and the requirement for cholestrol-lowering drug can be reduced with bariatric surgery.
Sleep Apnea	•Obesity significantly increases the risk of obstructive sleep apnea, a disorder that impairs regular breathing while you sleep. • Weight loss after bariatric surgery may result in an improvement or remission of sleep apnea symptoms.
Gastroesophageal Reflux Disease (GERD)	• Due to increased pressure on the stomach, obesity can worsen GERD symptoms. • In some people, bariatric surgery may reduce the symptoms of GERD.
Joint Problems	•Conditions like osteoarthritis can develop as a result of obesity's increased load on the joints. •Following bariatric surgery, weight loss can ease joint discomfort and increase mobility.

Non-Alcoholic Fatty LIver Disease (NAFLD)	• NAFLD is a liver disease connected to obesity. • In certain circumstances, bariatric surgery can enhance liver function and treat NAFLD.
Cardiovascular Disease	• Obesity significantly increases the risk of heart disease and stroke. • By lowering blood pressure, cholesterol, and blood sugar levels, bariatric surgery can significantly reduce cardiovascular risk factors.
Mental Health	• Psychological disorders like depression and anxiety can be linked to obesity. • For some people, bariatric surgery can result in an increase in self-confidence and mental health.

5 SURGICAL PROCEDURE AND TECHNIQUES

5.1 Laparoscopic vs Open Surgery

There are two common methods utilized in bariatric surgery: laparoscopic and open. It is a surgical technique designed to aid people who have extreme obesity in losing weight and enhancing their health. The decision between the two strategies depends on a number of variables, including the patient's health, the surgeon's experience, and personal preferences. Both strategies have benefits and drawbacks.

5.1.1 Laparoscopic Surgery (Minimally Invasive Surgery)

1. Small Incisions: Laparoscopic surgery, which normally requires 4-6 tiny incisions in the abdominal wall, each measuring approximately half an inch, is sometimes referred to as minimally invasive surgery.
2. Instrumentation: Through these tiny incisions, specialized devices like a laparoscope (a long, thin tube with a camera) and surgical tools are introduced. On a monitor, the surgeon may see the operative site.

Table 3 Advantages and Disadvantages of Laparoscopic Surgery

Advantages	Disadvantages
• **Less pain:** Compared to open surgery, patients often feel less pain and suffering after their procedures. • **Faster Recovery:** Patients can resume daily activities more quickly, and recovery durations are often shorter. • **Lower Risk of Infection:** Infection is less likely with smaller incisions. • **Minimal Scarring:** Less pronounced scars are produced by smaller incisions.	• **Complexity:** Not all surgeons are skilled at laparoscopic surgery, which needs specific training and tools. • **Limited Access:** Laparoscopically performing difficult procedures or gaining access to certain anatomical components may be difficult.

5.1.2 Open Surgery (Traditional Surgery)

1. Large Incision: Open surgery involves making a single large incision (usually 6-12 inches) in the abdominal wall, allowing direct access to the surgical site.
2. Instrumentation: The surgeon uses conventional surgical tools and has a clear view of the operating area.[19]

Table 4 Advantages and Disadvantages of Open surgery

Advantages	Disadvantages
Greater Accessibility: Open surgery is appropriate for complicated situations or individuals with significant obesity because it gives the surgeon a better perspective and more direct access to the operative region. **Established Method:** Open surgery has been used for many years and is a well-proven technique.	**More Pain:** Patients often have a longer recovery time and greater postoperative discomfort. **Longer Hospital Stay:** After open surgery, hospital stays are frequently prolonged. **Greater Infection Risk:** The greater the incision, the greater the possibility of infection. **Visible Scarring:** The single, big incision usually leaves a scar that is more obvious.

5.2 Anaesthesia and Preoperative steps

A Preoperative evaluations of patients undergoing bariatric surgery should take place in a multidisciplinary team (MDT) environment. A bariatric surgeon, nursing specialist, dietitian, psychologist, anaesthesiologist with experience in managing patients undergoing bariatric surgery, and a doctor should make up the MDT. A complete preoperative evaluation is required to determine the common systemic consequences of obesity, such as diabetes mellitus, hypertension, and ischemic heart disease. The importance of an ECG examination cannot be overstated; other cardiac tests, including echocardiogram and cardiopulmonary exercise testing, may be necessary based on the patient's symptoms, the results of the inquiry, and the facilities that are accessible. Patients who may pose a high risk should be recognized. It is insufficient to identify high-risk individuals just based on BMI; therefore, it is helpful to determine if a patient has central obesity and metabolic syndrome. Prior to surgery, any comorbidities should be optimized because bariatric surgery is an optional procedure.[20] The Obesity Surgery Mortality Risk Score (OS-MRS) is a trusted tool used before bariatric surgery to figure out which patients might need care in a high-dependency or intensive care unit. This score helps identify patients who could be at a higher risk during surgery. At this point, it's critical to distinguish between patients who need optimization before a scheduled surgery date and those who aren't ready for one to be announced. Obstructive sleep apnea (OSA) is not preoperatively identified in 60% of surgical patients. The (STOP) snoring, tiredness, observed apnea, high blood pressure, and (STOPBANG) BMI, age, neck circumference, and gender questionnaires are helpful screening tools, primarily to identify surgical patients with undiagnosed OSA, but have also been shown to identify surgical patients with an increased risk of a wide range of post-operative complications.

Patients should bring their own CPAP (continuous positive airway pressure) equipment and a service history, as many obese patients with OSA use it. Those with sleep apnea who cannot tolerate CPAP should be postoperatively admitted to an HDU setting. The anesthetic team usually requests an ECG and an echocardiography in addition to reviewing the patient's medication history. To predict difficult ventilation or tracheal intubation, a complete assessment of the airway is necessary. It is important to assess fat distribution because patients with concentrated obesity typically have a less ideal airway structure.

5.2.1 During surgery

Many hospitals use self-positioning anesthesia, in which the patient lies on the operating table. By doing this, excessive manual handling is avoided, and pressure injuries may be prevented. During the surgery, the patient is often moved using an inflated "hover mattress." The operating table needs to support large weights and have the right leg and arm board attachments. For surgery, the reverse Trendelenburg position is typically necessary. The patient may have their arms extended on boards and their legs placed in gutters with a foot support to prevent slipping.[21]

Table 5 Recommended dosage for anesthetic medications

3. Lean body weight (males maximum 100 kg; females maximum 70 kg)z	Adjusted body weight (IBW+40% excess)	Total body weight
Propofol induction Fentanyl and alfentanil Morphine Non-depolarising neuromuscular blocking agents Paracetamol Local anaesthetics	Propofol infusion Neostigmine (maximum 5 mg) Sugammadex Antibiotics	Suxamethonium Low-molecular-weight heparins

5.3 Postoperative Monitoring and Care:

The first After achieving the maximum weight loss in the second year following bariatric surgery, the patient may experience a subsequent weight regain that persists through the fifth year. Subsequently, the Swedish longitudinal study revealed weight stability at 19.9 kg below the initial value. The percentage of patients who achieved sustained loss of more than 20% of their initial weight was 73.5% after gastric bypass and 27.6% after gastric banding. Weight loss correlated with notable enhancements in quality of life, physical activity, hypertension, diabetes, and lipid metabolism abnormalities. Additionally, it was linked to reduced incidence and mortality from cardiovascular and obesity-related diseases. After surgery, the patient should undergo extended postoperative care from a specialized physician in obesity treatment and a clinical nutrition expert. Follow-up aims not only to

enhance weight loss but also to avert nutritional deficiencies. The frequency of follow-up appointments relies on the specific procedure, the individual's weight loss progress, and potential complications. During the first year following surgery, patients should be examined every three months, as this is when weight loss happens at its fastest pace. Nutritionally and medically, the best diet is one that is well-balanced and that is supplemented with vitamins (B12 and D), minerals (calcium), trace elements (iron), and, if needed, protein, during the rapid weight loss phase (or permanently, following gastric bypass or BPD). There isn't a widely recognized protocol for nutritional supplements and laboratory monitoring. Certain pharmaceutical dosages may require reevaluation. Approximately one in ten patients may require subsequent surgery due to insufficient weight loss, weight regain, or complications such as gastric pouch issues, reflux, ulcers, and more. Laparoscopic revisions, with their increased complexity and risks, are advisable only in specialized centers with appropriate proficiency. Women in their childbearing years undergoing bariatric surgery should employ contraception during the rapid weight loss phase to avert nutritional disruptions in fetal development. Patients with pre-existing mental illness or those experiencing post-surgery eating disorders like binge eating or night eating should undergo postoperative care from a psychologist, psychosomatic medicine specialist, or psychiatrist. Specialized treatment is advised if mental health issues emerge or reoccur post-surgery. Engaging in self-help groups is encouraged, contributing to weight loss reinforcement.[22]

6 SHORT TERM AND LONG TERM OUTCOMES

The Patients who suffer from extreme obesity can greatly benefit, both in the short and long term, from bariatric surgery. Short-term weight loss is brought on by a decrease in calorie intake and modifications to the physiology of the digestive system. This leads to significant weight loss in the initial months following surgery. Many people also report fast improvements in or even remission of obesity-related medical issues such as type 2 diabetes, hypertension, and obstructive sleep apnea, which improves quality of life and reduces dependency on prescription drugs. This change enables patients to engage in previously difficult activities and promotes an active lifestyle by facilitating increased physical activity.

Long-term weight loss is possible; research shows that patients can maintain their lower body weight for more than ten years after surgery. Improvements in health conditions over time lead to a decreased risk of complications like heart disease and stroke, which in turn results in lower death rates from diseases associated with obesity. Ongoing monitoring is necessary, though, due to potential consequences like infections and nutritional shortages. Furthermore, long-term wellbeing depends on resolving psychological issues, including controlling expectations about weight loss and adjusting to a new body image, which frequently calls for ongoing assistance from mental health specialists. Thus, bariatric surgery offers a comprehensive strategy to address extreme obesity, with long-lasting advantages for mental and physical well-being.[23]

7 CONCLUSIONS

This overview underscores the transformative impact of Bariatric Surgery, elucidating its multifaceted benefits, diverse surgical approaches, procedural intricacies, and sustained outcomes. Beyond significant weight loss, the surgery proves instrumental in enhancing metabolic health, psychological well-being, and resolving obesity-related comorbidities. The personalized nature of Types of Bariatric Surgery, coupled with advancements in Surgical Procedure and Techniques, contributes to its holistic efficacy. Emphasizing a multidisciplinary approach, this overview positions Bariatric Surgery as a pivotal intervention, offering tangible and enduring improvements for individuals navigating the complex landscape of obesity.

REFERENCES

1. Shetye B, Hamilton FR, Bays HE. Bariatric surgery, gastrointestinal hormones, and the microbiome: an obesity medicine association (OMA) clinical practice statement (CPS) 2022. Obesity Pillars. 2022 Jun 1;2:100015.
2. Velapati SR, Shah M, Kuchkuntla AR, Abu-Dayyeh B, Grothe K, Hurt RT, Mundi MS. Weight regain after bariatric surgery: prevalence, etiology, and treatment. Current nutrition reports. 2018 Dec;7:329-34.
3. Green N. Bariatric surgery: an overview. Nursing Standard. 2012 May 9;26(36).
4. https://www.adventhealth.com/blog/7-life-changing-benefits-bariatric-surgery. accessed on November 5, 2023.
5. Mitchell BG, Gupta N. Roux-en-Y gastric bypass.
6. Weledji EP. Overview of gastric bypass surgery. International Journal of Surgery Open. 2016 Jan 1;5:11-9.

7. Azagury DE, Morton JM. Bariatric surgery: overview of procedures and outcomes. Endocrinology and Metabolism Clinics. 2016 Sep 1;45(3):647-56.
8. Shi X, Karmali S, Sharma AM, Birch DW. A review of laparoscopic sleeve gastrectomy for morbid obesity. Obesity surgery. 2010 Aug;20:1171-7.
9. Kheirvari M, Nikroo ND, Jaafarinejad H, Farsimadan M, Eshghjoo S, Hosseini S, Anbara T. The advantages and disadvantages of sleeve gastrectomy; clinical laboratory to bedside review. Heliyon. 2020 Feb 1;6(2).
10. Furbetta N, Cervelli R, Furbetta F. Laparoscopic adjustable gastric banding, the past, the present and the future. Annals of translational medicine. 2020 Mar;8(Suppl 1).
11. https://www.hopkinsmedicine.org/health/treatment-tests-and-therapies/laparoscopic-adjustable-gastric-banding.
12. Gündoğdu E, Moran M. Adjustable gastric banding.
13. Conner J, Nottingham JM. Biliopancreatic diversion with duodenal switch.
14. Anderson B, Gill RS, de Gara CJ, Karmali S, Gagner M. Biliopancreatic diversion: the effectiveness of duodenal switch and its limitations. Gastroenterology research and practice. 2013 Oct;2013.
15. Ahmad A, Laverty AA, Aasheim E, Majeed A, Millett C, Saxena S. Eligibility for bariatric surgery among adults in England: analysis of a national cross-sectional survey. JRSM open. 2014 Jan 7;5(1):2042533313512479.
16. Obese HJ. Body mass index (BMI). Obes Res. 1998;6(2):51S-209S.
17. Yermilov I, McGory ML, Shekelle PW, Ko CY, Maggard MA. Appropriateness criteria for bariatric surgery: beyond the NIH guidelines. Obesity. 2009 Aug;17(8):1521-7.
18. Kloock S, Ziegler CG, Dischinger U. Obesity and its comorbidities, current treatment options and future perspectives: Challenging bariatric surgery?. Pharmacology & Therapeutics. 2023 Oct 23:108549.
19. Nguyen NT. Open vs. laparoscopic procedures in bariatric surgery. Journal of gastrointestinal surgery. 2004 Aug;8(4):393-5.
20. Reeve K, Kennedy N. Anaesthesia for bariatric surgery. BJA education. 2022 Jun;22(6):231.
21. Rhind JH, Baker C, Roberts PJ. Total hip arthroplasty in the obese patient: tips and tricks and review of the literature. Indian Journal of Orthopaedics. 2020 Nov;54:776-83.
22. Runkel N, Colombo-Benkmann M, Hüttl TP, Tigges H, Mann O, Sauerland S. Bariatric surgery. Deutsches Ärzteblatt International. 2011 May;108(20):341.
23. Stanford FC, Mushannen T, Cortez P, Campoverde Reyes KJ, Lee H, Gee DW, Pratt JS, Boepple PA, Bredella MA, Misra M, Singhal V. Comparison of short and long-term outcomes of metabolic and bariatric surgery in adolescents and adults. Frontiers in endocrinology. 2020 Mar 24;11:157.

*****