American Journal of Medicine and Medical Sciences 2024, 14(9): 2445-2448
DOI: 10.5923/j.ajmms.20241409.69

Evolution of Bariatric Surgery

Makhmudov U. M.[1], Nishanov M. F.[2], Ibragimov U. Ya.[2]

[1]Republican Specialized Scientific and Practical Medical Center of Surgery named after Academician V. Vakhidov, Uzbekistan
[2]Andijan State Medical Institute, Uzbekistan

Abstract Bariatric interventions in morbid obesity, like any other area of practical health care, are based on certain principles and standards. All principles of surgical intervention in obesity were identified in the process of accumulating positive and negative experience in the use of surgical intervention methods of various mechanisms. This article presents the establishment of the fundamental principles of surgical treatment of obesity and associated diseases.

Keywords Bariatric surgery, Morbid obesity, Restrictive procedures, Malabsorptive surgeries

1. Introduction

Morbid obesity, caused by the accumulation of adipose tissue, is a multifactorial chronic disease, the prevalence of which is rapidly increasing in most countries of the world, including Uzbekistan. The WHO expert report for 2018 indicates that obesity rates have tripled compared to 1975 [23]. Today, more than 2.4 billion adults in the world are overweight, and 750 million have been diagnosed with morbid obesity. If this trend continues, by 2025 the number of people with obesity is expected to double compared to the figures at the beginning of the 21st century (The GBD Obesity Collaborators N Engl J Med, 2017) Moreover, according to the above-mentioned study, Uzbekistan occupies a leading position among the countries of Central Asia with an obesity rate of 20.4% of the total population.

Conservative treatment of morbid obesity is almost always unsatisfactory, so several surgical methods have been developed. There are four types of methods: malabsorptive procedures; restrictive procedures; malabsorptive / restrictive procedures and experimental procedures [17], [5]. The development of bariatric surgery began in 1952 and has been developing dynamically since then. All surgical methods have advantages and disadvantages. Currently, the introduction of minimally invasive surgical methods seems to be a safe, effective and cost-effective method for the treatment of morbid obesity.

Choosing the right weight loss surgery continues to be a complex and subjective process. In experienced hands, most surgeries can be successful, providing the patient with significant weight loss and improved health by eliminating obesity, reducing comorbidities, and improving overall health and quality of life. There are intraluminal restrictive mechanisms, intragastric balloons, gastric stimulation, and variations in modern procedures aimed at improving metabolism. The future availability of these procedures may further complicate the decision-making process for patients and surgeons.

The health risks associated with obesity are complex, multifactorial, and associated with multiple comorbidities associated with excess weight, reduced quality of life, and mobility risks that lead to accidents and injuries. It is estimated that 70% of the risk of diabetes in the United States can be attributed to excess weight [11], [1], and the prevalence of hypertension among obese adults (BMI≥30) is 41.9% for men and 37.8% for women.

2. Evaluation of the Obese Patient for Bariatric Surgery

In 2004, the American Society for Bariatric Surgery, now the American Society for Metabolic and Bariatric Surgery (ASMBS), issued a consensus statement that all patients undergoing bariatric surgery should be well informed and motivated, agreeable to lifestyle changes, and understand the need to participate in long-term follow-up. Most programs now offer a multidisciplinary team approach to patient evaluation and selection, including comprehensive medical, dietary, and psychological counseling [4].

Bariatric surgery can be performed safely and is a highly effective means of achieving significant weight loss, with profound effects on underlying medical conditions, often resulting in improvement and resolution. Most commonly performed procedures can be performed laparoscopically, offering the same surgery with less pain associated with a larger abdominal incision. More than 200,000 primary weight loss surgeries are performed in the United States each year, including laparoscopic Roux-en- Y gastric bypass (RYGB).

RYGB was first described by Mason and Ito in 1966 and has since become the most commonly performed weight loss surgery in the United States. Components of a successful procedure include a small proximal gastric pouch, typically

Received: Aug. 26, 2024; Accepted: Sep. 22, 2024; Published: Sep. 30, 2024
Published online at http://journal.sapub.org/ajmms

less than 30 cc in volume, a small gastrojejunostomy of approximately 12 mm in diameter, and a Roux -en-Y loop of 60 to 250 cc or more in length to control malabsorption, depending on patient factors and surgeon preference [14].

laparoscopically placed adjustable gastric band has been approved by the U.S. Food and Drug Administration since June 2001 and is growing in popularity, becoming the second most commonly performed weight loss surgery in the United States. LAGB was first described by Belachev and colleagues in 1993 and has become the most commonly performed weight loss surgery in Europe, Australia, and Latin America.

3. Laparoscopic Biliopancreatic Diversion with Duodenal Switch

BPD (biliopancreatic Diversion), a malabsorptive procedure, was first described by Scopinaro in 1976 as an operation involving partial gastrectomy preserving a gastric pouch of 250 to 500 cc. and emptying into a 250 cc Roux-en-Y loop with a 50 cc common suction channel. To reduce the incidence of marginal ulceration and metabolic derangements, Marco and Hess described a modification of BPD called duodenal switch (BPD-DS), creating a gastric sleeve and preserving the pylorus [8].

Laparoscopic sleeve gastrectomy is one of the newer, purely restrictive procedures performed as a primary weight loss surgery and can be compared to the gastric segment in BPD-DS Sleeve gastrectomy is a variant of the Magenstrasse and Mill (MM) procedure, which was designed to mimic IBG by creating a long gastric tube but without a foreign body, eliminating the risk of erosion. Sleeve gastrectomy differs from MM by resecting the dysfunctional gastric fundus [6].

Del thinks Castillo D e jardin D, (2004) in the field of laparoscopy there is a clear trend towards the use of large laboratory animals such as pigs. They are useful for developing and refining techniques. A second area of animal experimentation focuses on the relationship between metabolism and surgery in order to find improvements in the comorbidities associated with morbid obesity [21]. A third area of research focuses on the management of food intake through central and vagal control [10].

Over the past few years, there have been many publications on sleeve gastrectomy. It is a bariatric procedure that has evolved from traditional restrictive and malabsorptive procedures. Initially used as a bridge to radical surgery in high-risk patients, it has recently come to be used as a stand-alone procedure. The technical details of laparoscopic sleeve gastrectomy (LSG) vary, but the essence is the removal of most of the stomach, especially the fundus, leaving only a thin gastric tube between the esophagus and duodenum. This results in weight loss through restrictive as well as neurohormonal mechanisms. A review of the literature shows that the mean expected excess weight loss (EWL) is 61% [2,20]. Morbidity and mortality appear to be on par with laparoscopic adjustable gastric banding (LAGB), but with superior weight loss results and an improved long-term complication profile. Unlike popular mixed malabsorption procedures such as Roux -en-Y gastric bypass (RYGB) and biliopancreatic diversion with duodenal switch (BPD-DS), there is no gastrointestinal bypass, allowing for continuity of endoscopic interventions and surveillance. Resolution of comorbidity with LSG is variable, although it compares favorably to other bariatric procedures.

Janik MR, et al (2016) compared the quality of life (QL) in obese patients after bariatric surgery with that in the control group, and also found out which factors are associated with QOL according to the Moorhead-Ardelt Quality of Life Questionnaire II (MA II). The operated group included patients who had undergone laparoscopic sleeve gastrectomy or laparoscopic Roux-en-Y gastric bypass. The control group consisted of 101 obese patients. Multiple logistic regression and correlation analysis was performed to identify factors associated with quality of life [13].

The prevalence of satisfactory QL outcomes was similar in both postoperative subgroups and was still higher than in the control group. Four factors were identified that were associated with higher QL in obese patients. Weight loss was not correlated with the MAII total score. This study demonstrates that patients after bariatric surgery have a higher MAII score. II, which reflects a better quality of life.

The goal of bariatric surgery is to improve obesity-related comorbidities and improve QL by reducing excess weight. Many studies have shown a positive effect of surgical weight loss on quality of life [3,12,18]. However, limited data are available on which factors influence quality of life measured by the Moorhead-Ardelt Quality of Life Questionnaire II (MA II) in obese patients and which factors may be potential confounders. Bariatric surgery is evolving and trends in the types of procedures performed are still changing. Laparoscopic sleeve gastrectomy (LSG) and laparoscopic Roux-en- Y gastric bypass (LRYGB) are currently the most popular types of bariatric surgeries [6]. The procedures are equally effective in maintaining weight loss during short-term follow-up, but LRYGB appears to be more effective in addressing obesity-related comorbidities [9,15,24].

In LSG, 75-80% of the greater curvature was resected, creating a narrow sleeve stomach. A 36 French bougie was used to calibrate the sleeve. In LRYGB, the stomach was transected, creating a 25-30 ml pouch. A gastrojejunal anastomosis was then performed using a circular stapler. After this, two loops of small intestine were sutured side by side, creating a jejunostomy with a Roux-en-Y limb length of ~150 cm.

Regardless of the type of surgical intervention, patients were tested with methylene blue solution intraoperatively and on the first day after surgery. If no suture failure was detected, the oral diet was resumed. Patients were discharged on the second day after surgery. In general, both procedures were performed laparoscopically using five trocars.

Knowledge of QL changes after weight loss surgery is essential for every bariatric surgeon. In 2003, Ballantyne et al. reported an overall improvement in QL after bariatric surgery [7]. However, trends in bariatric surgery have

changed and new procedures such as LSG and LRYGB have gained popularity. These procedures are similar in terms of excess weight loss but have different effects on morbidity. LRYGB appears to be more effective in improving glycemic control and treating hypertension [9]. Significant differences in QL improvement have been found between different types of bariatric surgery [12] Given the observed trends in bariatric surgery, there is a need for new studies comparing QL outcomes after LSG and LRYGB, the most commonly performed bariatric surgeries [6]. Janik's Results MR (2016) were consistent with the findings presented by Zangh et al and Major et al. It is important to note that these authors used the same questionnaire to assess QL. In addition, the Peterli study et al., where the authors used the gastrointestinal quality of life index (GQLI), found no difference between patients after LRYGB and after LSG [19]. Many believe that weight loss reflects a successful outcome of bariatric surgery. However, in this study, QL was not affected by BMI. Similarly, Muller et al. analyzed factors affecting QL in 104 patients and found no correlation between BMI and QL [16]. Major P et al stated that quality of life was not affected by excess weight loss percentage (EWL%). Their results were similar to those of Sarwer DB (2010), who found no correlation between weight loss and improved quality of life [22].

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