

The Result of Different Kinds of Weight Loss Surgeries in Obese Patients at Kirkuk City

Dler Omar Mohammed^{1,*}, Alan Adnan Saber¹, Tareq Jawad kadem Al-Rubayee² and Abbas AbdulWahhab Jumaah Al-Salihi³

¹Department of Surgery, FIBMS, College of Medicine, Kirkuk University; Azadi Teaching Hospital, Kirkuk-Iraq.

²Ministry of Higher Education and Scientific Research, AL-Rasheed University College, Department of Pharmacy, Baghdad, Iraq.

³Department of Applied Embryology, High Institute for Infertility Diagnosis and Assisted Reproductive Technologies, Nahrain University, Kadhimiya, Baghdad, Iraq.

Corresponding author: Dler Omar Mohammed (e-mail: drdler1974@uokirkuk.edu.iq).

©2023 the Author(s). This is an open access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>)

Abstract Objective: Our study aimed to evaluate the outcomes of obese patients undergoing weight loss surgeries in Kirkuk City. **Background:** We can define Obesity as a common factor in the contemporary world. Obesity is a major factor in cardiovascular disease, diabetes, and renal disease. It was also linked to various comorbidities. Weight loss surgery has beneficial effects on both Obesity and comorbidities. **Patients and methods:** This paper examines weight loss surgeries for obese patients using data collected from Baghdad, Iraq, between 16 January 2019 and 15 December 2022. By studying the outcomes of 122 patients, including 89 women (73%) and 33 men (27%), we developed the methodology to assess outcomes; each patient underwent one of several weight-reduction procedures. **Results and discussion:** Obesity is a severe health problem, and according to Epidemiological studies, Obesity affects approximately 400 million people worldwide. Females outnumbered males in all categories, possibly because women are more susceptible to psychological difficulties and more concerned about the aesthetic implications of Obesity. As a result, our study detected that women have more Obesity than males, where women were 89 and males had 33 cases of 122. Laparoscopic sleeve surgery is considered the most common surgery in the world (LGS), which is well-established in the treatment of morbid Obesity and has a significant impact on weight loss and the risk of comorbidities. This technique resulted in significant weight reduction. Previous studies indicated that having a high BMI increases the risk of operational mortality and complications. Due to that, the Ur study found that laparoscopic gastric sleeve (LGS) got the most cases with 75 of 122 patients. Also, our outcomes found that infections were the highest score of 11 patients who had complications, where there may be an increased risk of site infections. **Conclusion:** A range of weight loss procedures was employed in Kirkuk City to address morbid Obesity, with all procedures resulting in successful weight loss outcomes. However, LMGB patients showed the most significant benefits.

Key Words Obesity, Bariatric surgery, Laparoscopic gastric sleeve (LGS), Laparoscopic mini-gastric bypass (LMGB), Laparoscopic Roux-en-Y gastric bypass (LRYGB)

1. Introduction

A complex health issue, obesity can be affected by a number of dietary, environmental, and hereditary variables [1]. Numerous problems, including as inflammatory processes, insulin resistance, atherosclerosis, coronary artery disease, hypertension, and diabetes mellitus, are brought on by its ubiquitous incidence [2]–[4].

With the rise of morbid obesity and its related diseases, including diabetes, heart disease, and cancer, surgical interventions are widely regarded as the most effective option for individuals classified as severely obese with a body mass index (BMI) of over 35. However, alternative methods, like

gastric sleeve surgery, whereby the size of the stomach is reduced, are increasingly popular. This procedure is technically less complex and results in fewer complications, even for patients with a very high BMI [5]–[8].

Three decades of extensive use of bariatric surgery have shown its significant effectiveness in managing diseases associated with obesity. The knowledge gained over the years has not only established the potential of this area in clinical medicine but also aided in developing assessment criteria for long-term outcomes of different surgical and endoscopic interventions [9]–[11].

A BMI range of 18.5-24.9 kg/m² is seen as a standard. The

achievement of the noted indicators of "ideal body weight" is often limited despite the use of all available overweight correction and treatment methods in contemporary medicine. Additionally, reducing body weight to meet "golden parameters" may conflict with the primary objective of bariatric surgery, which is to restore (preserve) health and resolve aesthetic issues [12].

That weight loss surgery is generally more effective than non-surgical interventions for weight loss and associated comorbidities. Where LRYGB and LSG were more effective than LAGB at achieving weight loss and had fewer long-term complications, but LAGB was still less effective than the other two procedures [13].

When compared to non-surgical therapies, bariatric surgery performed better with regard to weight reduction and metabolic markers. Colquitt (2014) discovered that some procedures, such LRYGB and LSG, were more successful than others and that surgery improved weight reduction outcomes and comorbidities more than non-surgical therapies [14], [15].

2. Patients and Methods

This paper examines weight loss surgeries for obese patients, using data collected from Baghdad, Iraq, between 16th January 2019 and 15th December 2022. By studying the outcomes of 122 patients, including 89 women (73%) and 33 men (27%), we developed the methodology to assess outcomes; each patient underwent one of several weight-reduction procedures. Primary data were collected, which included age, body mass index, and comorbidities, and liver function indexes, as well as the corresponding operative method. The statistical outcomes of our study were analyzed using the SPSS 22.0 software. A significant result was considered when $P < 0.05$.

Furthermore, the choice of surgery was determined by the patient's health status, preoperative BMI, presence of co-morbidities, and medical recommendations. The patients' weights ranged from 90 kg to 210 kg (mean: 105.8 kg), while their ages ranged from 17 to 55 (mean: 32.10 years). For laparoscopic procedures, the mean BMI was 40.5 kg/m^2 (range 32 to 65.8). In addition, laparoscopic operations were performed with an average operating time of 90 ± 18.5 minutes, and follow-up was conducted over a period of 28 months (12-40 months).

During LGS, the surgeon removes around 85% of the stomach, which results in a cylindrical tube with a capacity of 60 to 100 cm^3 , depending on the patient's pre-operative BMI. The ileum and pre-formed small pouch stomach are joined side by side (one anastomosis) in LMGB. Technical term abbreviations are spelled out upon first usage.

Before and after surgery, we recorded the body weight, height, and BMI of each patient. We objectively assessed the health indicators of each patient and discussed the surgical risks with them to obtain informed consent before proceeding with the operation.

No. of patients	Type of bariatric surgery
75	laparoscopic gastric sleeve (LGS)
17	laparoscopic mini-gastric bypass (LMGB)
3	laparoscopic Roux-en-Y gastric bypass (LRYGB)
18	SASI
9	laparoscopic gastric plication (LGP)
Total	122 patients

Table 1: Distribution of patients according to bariatric surgery

Number of patients	122
Age (yr)	17 - 55 years (mean 32 ± 10 years)
Gender (female /male)	89/33
BMI1 (kg/m ²)	40.5 ± 5 (range 32-65.8) kg/m ² .
Comorbidities	
hypertension	16
Diabetes mellitus	12
Others	25
Operating time (min)	$90 \pm 18.5(60 - 160)$
Hospital stays (day)	2.4 (1 - 5)

Table 2: Demographics of patients who underwent weight-reducing procedures.

The Roux-en-Y gastric bypass procedure has shown significant benefits for treating type 2 diabetes mellitus. SASI is a form of Sleeve Gastrectomy in which a loop of the ileum is fastened to a sleeve of the stomach using staples, around 250-300 cm from the DJ junction (duodenojejunal junction). Furthermore, laparoscopic gastric plication only reduces gastric capacity by enclosing the stomach rather than excising it.

Before performing the surgery, we evaluated each patient's health metrics, including height, weight, and BMI. Before carrying out the procedure, we thoroughly evaluated the health metrics of each patient, discussed the surgical risks with them, and obtained their consent and informed agreement.

3. Results

Table 1 shows the patient distribution.

Table 2 was detected the rate of gender that females have scored high cases than males, where females got 89 but males 33. Also, comorbidities showed a high percentage of patients with hypertension, of 16 cases, while diabetes 12, as well as others, enrolled the highest with 25.

In comparison with previous studies, Table 3 was enrolled a good rate of complications with obese patients where the infection was determined in 11 cases.

Figure 1 Post-operative complications of obese patients.

According to the SF-36 questionnaire, our outcomes were assessed quality of life, which enhanced the rate of body health after surgery. Physical function was enrolled in pre-operative 33.26 while post-operative 54.67 (Figure 2).

4. Discussion

Obesity is one of the most common diseases in the world, which constitutes a major health problem that sometimes

NO	procedure	sex		Age MEAN	Weight before surgery (KG)	Height (m)	BMI Before surgery	Last BMI	FOLLOW UP TIME(MONTHS)
		F	M						
75	LGS	53	22	19.7	91 - 175	1.5 - 1.8	42.95	30.24	30
17	LMGB	12	5	17.2	110 - 164	1.4 - 1.7	48.92	23.65	26
3	LRYGB	2	1	25.0	105 - 185	1.4 - 1.7	52.12	38.53	24
18	SASI	16	2	17.2	113 - 160	1.5 - 1.7	44.59	25.56	32
9	LGP	6	3	26.8	85 - 108	1.4 - 1.6	35.62	21.88	28
Total:122		89	33						

Table 3: BMI reduction following various types of weight loss surgeries.

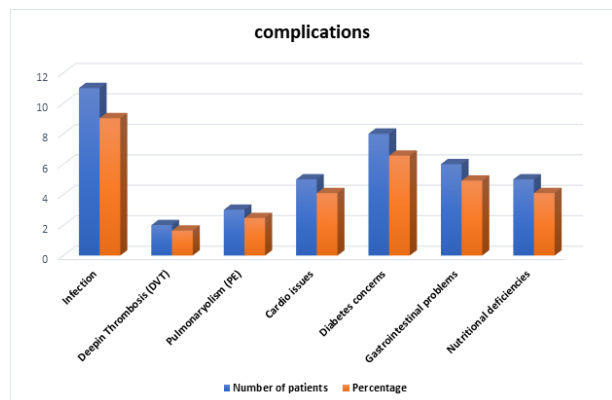


Figure 1: Post-operative complications of obese patients

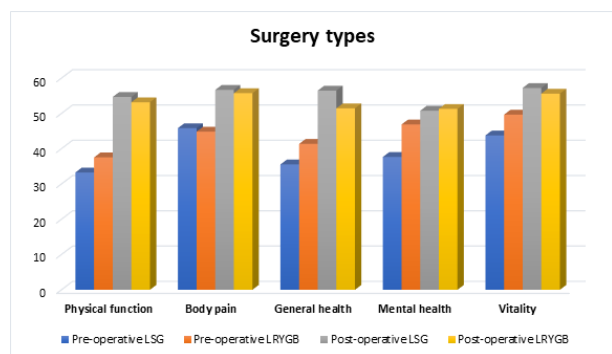


Figure 2: Assessment of quality of life by the SF-36 questionnaire after bariatric surgery.

leads to death. Through reviewing previous studies, it was found that approximately 400 million people in the world suffer from obesity [16]. The management of obesity is challenging despite the use of many therapeutic options, such as dietary restriction, regular aerobic activity, behavioral approaches, and pharmaceutical variables. There is a slight weight reduction advantage to each of these methods [17]. In addition, weight regain is typically a problem after stopping or discontinuing these interventions.

As a result, surgical procedures such as bariatric surgery are chosen when medical therapy or other tactics fail in significant and resistant patients [18]. The surgical procedures used in the current study were (LGS).

(LMGB), single anastomosis sleeve ileal bypass (SASI), laparoscopic gastric placement (LGP), and laparoscopy Roux-en-Y gastric bypass (LRYGB). The current study's findings agree with those that have been reported by [19],

[20]. In every category, the number of females exceeded that of males, presumably due to the fact that women are more prone to psychological issues and are more conscious of the aesthetic consequences of obesity [21]. Because of this, the laparoscopic gastric sleeve (LGS), that is widely used to treat morbid obesity and has a major effect on weight reduction and the risk of co-morbidities, is the most popular bariatric procedure worldwide.

Significant weight loss was achieved with this strategy [22]. According to earlier research, a high body mass index raises the risk of complications and operative mortality. Additionally, because the abdominal wall is thicker than the abdominal cavity, there is a greater chance for intra-abdominal side effects. Additionally, after the procedure, this group of people is more prone to experience thromboembolic problems [23].

Like previous research, our analysis revealed that, out of 122 individuals, laparoscopic gastric sleeve (LGS) received the greatest number of cases. This might account for the higher incidence of problems linked to different types of bariatric surgery [24]. Patients with SSO pose a challenge to the medical and surgical fields. The safety of the operation in each patient demography becomes more crucial as the prevalence of obesity and the number of weight reduction surgery procedures rise.

Obesity surgery has been shown to be effective for those who are overweight in prior studies [25]. A British study published in November 2014 confirmed the effectiveness of weight correction procedures in preventing type 2 diabetes [26].

Further studies have reported that surgical intervention for obesity can also lower the risk of vascular diseases and even prevent certain types of cancer among overweight patients [27]. However, a French study found that the long-term impact of joint replacement surgeries on obese patients who have undergone obesity surgery remains unclear [28]. On the other hand, the study's findings suggest that surgical weight correction is probably a cost-effective approach and can enhance outcomes for obese patients.

During a SASI bypass, a sleeve gastrectomy, one anastomosis is made between the ileum and the stomach antrum. Our study detected that women have more obesity than males, where women were 89 and males had 33 cases of 122. According to the latest studies, our study found that infections were the highest score of 11 patients with complications, where there may be an increased risk of site infections.

5. Conclusion

Obesity surgery indicates encouraging results for people who are obese and want to lose weight. It has been discovered that the operations successfully eliminate extra weight and enhance general health results. Our outcomes showed a positive correlation between conducting reconstructive bariatric surgery and its successful scores of outcomes. Out of the five groups studied, this study found that (LMGB) had the most promising results in weight loss and reduction of obesity-related comorbidities. On the other hand, the most common bariatric procedure used to reduce weight is laparoscopic sleeve gastrectomy or LGS.

Conflict of Interest

The authors declare no conflict of interests. All authors read and approved final version of the paper.

Authors Contribution

All authors contributed equally in this paper.

References

- [1] Frachetti, K. J., & Goldfine, A. B. (2009). Bariatric surgery for diabetes management. *Current Opinion in Endocrinology, Diabetes and Obesity*, 16(2), 119-124.
- [2] Goldfine, A. B., Shoelson, S. E., & Aguirre, V. (2009). Expansion and contraction: treating diabetes with bariatric surgery. *Nature Medicine*, 15(6), 616-617.
- [3] Kahn, S. E., Hull, R. L., & Utzschneider, K. M. (2006). Mechanisms linking obesity to insulin resistance and type 2 diabetes. *Nature*, 444(7121), 840-846.
- [4] Saber, A. A., Elgamil, M. H., & McLeod, M. K. (2008). Bariatric surgery: the past, present, and future. *Obesity Surgery*, 18, 121-128.
- [5] Cunneen, S. A. (2008). Review of meta-analytic comparisons of bariatric surgery with a focus on laparoscopic adjustable gastric banding. *Surgery for Obesity and Related Diseases*, 4(3), S47-S55.
- [6] Phillips, E., Ponce, J., Cunneen, S. A., Bhojru, S., Gomez, E., Ikramuddin, S., ... & Zundel, N. (2009). Safety and effectiveness of Realize adjustable gastric band: 3-year prospective study in the United States. *Surgery for Obesity and Related Diseases*, 5(5), 588-597.
- [7] Ferrannini, E., Camastra, S., Gastaldelli, A., Sironi, A. M., Natali, A., Muscelli, E., ... & Mari, A. (2004). Beta-cell function in obesity: effects of weight loss. *Diabetes*, 53(suppl_3), S26-S33.
- [8] Guidone, C., Manco, M., Valera-Mora, E., Iaconelli, A., Gniuli, D., Mari, A., ... & Mingrone, G. (2006). Mechanisms of recovery from type 2 diabetes after malabsorptive bariatric surgery. *Diabetes*, 55(7), 2025-2031.
- [9] Gentileschi, P., Gagner, M., Milone, L., Kini, S., & Fukuyama, S. (2006). Histologic studies of the bypassed stomach after Roux-en-Y gastric bypass in a porcine model. *Obesity Surgery*, 16(7), 886-890.
- [10] Davis, K. G., Wertin, T. M., & Schriver, J. P. (2003). The use of simvastatin for the prevention of gallstones in the lithogenic prairie dog model. *Obesity surgery*, 13(6), 865-868.
- [11] Sanchez-Margallo, F. M., Loscertales, B., Díaz-Güemes, I., & Uson, J. (2007). Technical feasibility of laparoscopic Finney pyloroplasty examined in a canine model. *Surgical endoscopy*, 21, 136-139.
- [12] Fisher, D. P., Johnson, E., Haneuse, S., Arterburn, D., Coleman, K. J., O'Connor, P. J., ... & Sidney, S. (2018). Association between bariatric surgery and macrovascular disease outcomes in patients with type 2 diabetes and severe obesity. *Jama*, 320(15), 1570-1582.
- [13] Singh-Franco, D., Perez, A., & Harrington, C. (2011). The effect of pramlintide acetate on glycemic control and weight in patients with type 2 diabetes mellitus and in obese patients without diabetes: a systematic review and meta-analysis. *Diabetes, Obesity and Metabolism*, 13(2), 169-180.
- [14] Abarca-Gómez, L., Abdeen, Z. A., Hamid, Z. A., Abu-Rmeileh, N. M., Acosta-Cazares, B., Acuin, C., ... & Cho, Y. (2017). Worldwide trends in body-mass index, underweight, overweight, and obesity from 1975 to 2016: a pooled analysis of 2416 population-based measurement studies in 128.9 million children, adolescents, and adults. *The lancet*, 390(10113), 2627-2642.
- [15] Bennett, J. M., Mehta, S., & Rhodes, M. (2007). Surgery for morbid obesity. *Postgraduate Medical Journal*, 83(975), 8-15.
- [16] Belachew, M., Legrand, M., Vincent, V., Deffechereux, T., Jourdan, J. L., Monami, B., & Jacquet, N. (1995). Laparoscopic placement of adjustable silicone gastric band in the treatment of morbid obesity: how to do it. *Obesity Surgery*, 5(1), 66-70.
- [17] Deitel, M. (2003). Overweight and obesity worldwide now estimated to involve 1.7 billion people. *Obesity Surgery*, 13(3), 329-330.
- [18] Akool, M. A. Z., Al-Hakkak, S. M. M., Al-Wadees, A. A., Muhammad, A. S., & salim Al Baaj, S. (2021). Sleeve gastrectomy versus mini-gastric bypass and their effects on type II diabetes mellitus and weight loss outcome. *Journal of Medicine and Life*, 14(5), 658-666.
- [19] Verdi, D., Prevedello, L., Albanese, A., Lobba, A., & Foletto, M. (2015). Laparoscopic gastric plication (LGCP) vs sleeve gastrectomy (LSG): a single institution experience. *Obesity Surgery*, 25, 1653-1657.
- [20] Sayyoub, A. S., Elwan, A. M., & Hassan, R. A. (2020). Benefits and risks of laparoscopic gastric surgery for management of morbidly obese patients. *International Journal of Medical Arts*, 2(2), 373-384.
- [21] Boza, C., Gamboa, C., Salinas, J., Achurra, P., Vega, A., & Pérez, G. (2012). Laparoscopic Roux-en-Y gastric bypass versus laparoscopic sleeve gastrectomy: a case-control study and 3 years of follow-up. *Surgery for Obesity and Related Diseases*, 8(3), 243-249.
- [22] Fried, M., Yumuk, V., Oppert, J. M., Scopinaro, N., Torres, A., Weiner, R., ... & International Federation for the Surgery of Obesity and Metabolic Disorders-European Chapter (IFSO-EC) and European Association for the Study of Obesity (EASO). (2014). Interdisciplinary European guidelines on metabolic and bariatric surgery. *Obesity Surgery*, 24, 42-55.
- [23] Fernandez Jr, A. Z., Demaria, E. J., Tichansky, D. S., Kellum, J. M., Wolfe, L. G., Meador, J., & Sugerman, H. J. (2004). Multivariate analysis of risk factors for death following gastric bypass for treatment of morbid obesity. *Annals of Surgery*, 239(5), 698-702.
- [24] Christou, N. V., Sampalis, J. S., Liberman, M., Look, D., Auger, S., McLean, A. P., & MacLean, L. D. (2004). Surgery decreases long-term mortality, morbidity, and health care use in morbidly obese patients. *Annals of Surgery*, 240(3), 416-423.
- [25] Mahawar, K. K., Graham, Y., Carr, W. R., Jennings, N., Schroeder, N., Balupuri, S., & Small, P. K. (2015). Revisional Roux-en-Y gastric bypass and sleeve gastrectomy: a systematic review of comparative outcomes with respective primary procedures. *Obesity Surgery*, 25, 1271-1280.
- [26] Coblijn, U. K., Verveld, C. J., van Wagenveld, B. A., & Lagarde, S. M. (2013). Laparoscopic Roux-en-Y gastric bypass or laparoscopic sleeve gastrectomy as revisional procedure after adjustable gastric band-a systematic review. *Obesity Surgery*, 23, 1899-1914.
- [27] Cheung, D., Switzer, N. J., Gill, R. S., Shi, X., & Karmali, S. (2014). Revisional bariatric surgery following failed primary laparoscopic sleeve gastrectomy: a systematic review. *Obesity Surgery*, 24, 1757-1763.
- [28] Wang, M. C., Guo, X. H., Zhang, Y., Zhang, Y. L., Zhang, H. H., & Zhang, Y. C. (2015). Laparoscopic Roux-en-Y gastric bypass versus sleeve gastrectomy for obese patients with Type 2 diabetes: a meta-analysis of randomized controlled trials. *The American Surgeon*, 81(2), 166-171.