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Research Article: Sleeve Gastrectomy

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Abstract

Obesity has been accompanied many diseases such as hypertension, arteriosclerosis, diabetes and respiratory problems for many years. These diseases could lead to a risk of early death especially when a person's cannot lose weight whether by following a diet or by exercises and this might be surgery an option to treat these cases. Sleeve gastrectomy originally performed as a restrictive component of a duodenal replacement procedure. Partial vertical gastrectomy helped reduce stomach capacity and initiate weight loss in the short term while the malabsorption component in the operation provides long-term weight loss. However, some patients were unable to undergo gastric bypass, and early investigations found that significant weight loss occurred with SG alone. The sleeve then evolved into a risk management strategy for older or high-risk patients who would not tolerate a longer or more serious procedure. A patient may advised to have sleeve gastrectomy. However, whether to go through this surgery or not is always the patient's decision.

Key word: *sleeve gastrectomy, obesity, advantages, disadvantages.*

Introduction:

Obesity recognize as a more energy intake and excessive accumulation of fatty deposits over time, which leads to the accumulation of excess fat in the body. Obesity is a serious medical problem and a heavy encumbrance on the families' health around the world, in addition to consider as one of the major risk factors for non-communicable diseases (Huang *et al.*, 2019). The primary way to combat obesity is to introduce maintain proper eating habits, rational diet and increase physical activity. Reducing body mass using this procedure is a long process and might be ineffective in people with metabolic disorders or hormonal imbalances, in addition to a low physical activity level or with a genetic burd

(Szczuko *et al.*, 2017). Bariatric surgery is the quickly and most effectively ways to reduce body mass and adipose tissue (Malin and Kashyapa, 2015).

Bariatric surgery in the form of sleeve gastrectomy SG has become the mostly frequent performed metabolic surgery to treat the obesity over the past several years, depending on the successes achieved for many patients who were suffering from obesity. Consider it as the optimal solution and a guaranteed treatment to get rid of excess weight irreversibly especially when use the right technology for the operation, whereby the gastric sleeve surgery is done by laparoscope and this reduces the surgical incision (Qasim *et al.*, 2018).

Sleeve gastrectomy can be summarized as the excision of part of the original stomach which makes the obese person satisfy with little amount of food. It operation that performed to reduce the weight and size of the stomach to 25% of its original size through surgical by removal large part of it, with the possibility of expanding the stomach later. The sleeve gastrectomy performed through endoscopy by removing a large part of the stomach leaving a small part that resembles a banana and becomes possible to reduce the amount of eaten food by the patient (Elrashidy *et al.*, 2018). Additionally, a series of hormonal changes that occur after surgery in obese patients contribute to decreased appetite, reduced food intake and long-term weight loss (Kehagias *et al.*, 2016).

Before starting the gastric sleeve surgery, it is important to have a good knowledge of the digestive system in order to understand this surgery. The digestive process occurs when the food we eat is broken down into small pieces and enter the blood stream. The food moves after chew and swallow through the oesophagus to the stomach and with the hydrochloric acid, it will proceed the digestive process. The stomach can accommodate one and a half litre of food each time and then the digested contents move to the first part of the small intestine (duodenum) and mix with special juices coming from the liver called the bile and pancreatic juice. Most of the iron and calcium founded in the food is absorbed in the duodenum while the remaining two parts of the small intestine: the jejunum and the ileum with approximately 6 meters long complete the digestion process. The food particles that cannot digest go through the large intestine or the colon to dispose of (Cummings *et al.*, 2016).

Obesity specialists help the obese patients get rid of excess weight through many treatment options, including following a diet, exercising, uses of medication and finally surgery. Researchers have developed many diets to help lose weight, and patients with obesity are required to follow a special diet under medical supervision, and exercising helps reduce the weight, and makes the body healthier and more

consistent; it also makes people feel good about themselves. Using drugs is also an option, but these drugs may have harmful side effects and you should not take any drugs that reduce weight except under medical supervision (Walsh *et al.*, 2019). Additionally to a several bariatric surgeries that help to reduce weight, and among these are stomach reduction operations. The gastric sleeve surgery is one of these types, after which the stomach cannot returned to its original state. Other surgeries aim at bypassing the larger part of the small intestine where the nutrients are absorbed, they known as absorption reduction processes (Chen *et al.*, 2018).

Gastric sleeve surgery is a relatively recent surgery and in order for the patient to be physically fit for this surgery, the mass index should be more than 40, and this equates to an increase in weight equal to 40 kg in males and 36 kg in females. The doctor after making sure that the patient is eligible to undergo bariatric surgery explains the risks and benefits of the operation and then makes sure that the patient is ready to undergo many changes that happen to the patient after the operation (Varban and Dimick, 2019).

Before commencing any surgery, we should check the following (Oldfield, 2018):

1. The decision on surgical treatment requires an assessment of the benefits and risks to the patient, and the accurate performance of the surgical procedure.
2. The success of gastric sleeve surgery depends on long-term lifestyle changes in diet with Gastric sleeve surgery is the first step before other surgeries, for example bypass surgery.

The specialist doctor shapes a small stomach using a stapling device, and then removes the rest of the stomach. This procedure may lead to weight loss by reducing the amount of food in the stomach and thus reducing calories. Losing weight associated with improving the parameters of metabolic syndrome with the gastrectomy and the subsequent neurohormonal changes. In the event that the first step is gastric sleeve surgery followed by bypass surgery, the surgeon connects part of the small intestine directly to the stomach, which makes the food bypass part of the small intestine (De Oliveira *et al.*, 2017).

How gastric sleeve surgery is performed:

There are two different methods of sleeve gastrectomy, both of which are performed while the patient is under general anaesthesia (Mansour *et al.*, 2013 ; Major *et al.*, 2018):

1. The normal method: making a large incision or wound through which the tissues and skin removed to reach the stomach.

2. Laparoscopic surgery: This type does not require making a large incision or wound in the patient's body to reach the targeted internal area and this type of surgery is preferred over regular surgery in order to reduce the chances of complications.

The advantages and disadvantages of sleeve gastrectomy (Sinclair *et al.*, 2018 ; Kheirvari *et al.*, 2020):

The advantages:

1. Better weight loss than other treatment alone
2. Improved blood sugar and blood pressure.
3. Improved breathing.
4. Ability to move better and be more active.
5. Improved fertility and pregnancy outcomes.
6. Lower risk of death from heart disease and some cancer.

The disadvantages:

1. Gastroesophageal reflux.
2. Diarrhoea.
3. Inflammation of the wound.
4. Chest infection.
5. Internal and external bleeding.
6. Fluids coming out of the operation wound.
7. Nausea and vomiting.
8. Leakage of stomach acid into the oesophagus.
9. Small intestine obstruction.

Preparing the patient for the surgery:

When the patient visits the doctor, the doctor performs a complete examination before performing the operation in addition to make blood tests and some medical images to ensure the patient's response to the surgery and his ability to endure it. It is necessary to inform the doctor of any medications that the patient takes. In case the patient was a woman, should tell the doctor if she was pregnant or having any diseases such as diabetes. Other thinks, smoking must stop if the patient was a smoker, because smoking increases the default time that the body needs to recover after the operation and increases the chances of infection and inflammations. The doctor connects a special tube between the patient's nose and stomach to help the stomach get rid of any fluids that may get stuck in it and reel nausea (Gerogiannis *et al.*, 2020). The patient receives his food during the recovery period intravenously until he becomes able and the doctor authorizes him to eat and drink normally.

After sleeve gastrectomy:

The patient stays in the hospital for a period of at least 1-2 weeks; the doctor closes the wound and puts the patient under observation. Sometimes the gastric sleeve is used for purposes, the most important of which is the treatment of some stomach problems that cannot be treated in any other way.

Sleeve gastrectomy and tumours:

Obesity is one of the major influencing risk factors of cancer (MacKintosh *et al.*, 2020). Sleeve gastrectomy is significantly associated with the reducing in cancer happening and mortality. The role of sleeve surgery in preventing cancer is the strongest for female obesity-related tumours. The primary technique might include both weight independent and weight dependent effects (Castagneto-Gisse *et al.*, 2020).

Physiological and biochemical effects after gastric sleeve:

Biochemical parameters clinically represent healthy levels of organs. After gastrostomy, biochemical markers were changed in succession and some reports gave perfect news on improving serum levels. In recently systematic review comparing the effect of bariatric surgery and non-operative of obesity treatment, there is an increase in weight loss, greater rates of diabetes departure and a decrease in using of anti-diabetic, antihypertensive and lipid-lowering drugs after surgery. Bariatric surgery might also

reduce diabetes-related morbidity and mortality and gave diabetic peoples a prolonged time of control (Mahmoud *et al.*, 2018). In addition, (Al-Zobaydi *et al.*, 2018) reported that sleeve gastrectomy is safely and effectively bariatric treatment with about 75% of the excessive weight initially achieved at the first two-years, normalization of blood sugar take place in 96% of patients with normal body cholesterol in all with favourable long-range outcome concerning weight loss and comorbidities. While (Attia, 2019) suggested that bariatric surgery especially aparoscopic sleeve gastrectomy (LSG) is not a weight reduction surgery only but also a metabolic surgery might cure mostly of the metabolic syndrome. It considered as the mostly effective long-range treatment form of diabetes type 2 in obese peoples.

Other researcher shown gastric bypass and sleeve gastrectomy cause significantly decreasing of dyslipidemia-linked cardiovascular injury. Both can cause significantly improved in serum HDL cholesterol and triglycerides. However, significant decrease of total cholesterol not achieved in any of the proceedings (Raj *et al.*, 2017). Whereas (Alsharkawy *et al.*, 2019) revealed that LSG is very good, bariatric surgery with perfect results on brief term, follow up regarding body weight reduction. Three months after operation improve metabolism and lipid profile accompanied by decrease in total cholesterol, triglyceride and LDL. Moreover, obesity patients are highly involve with hyperlipidaemia and other disorders of lipid that can largely refers to their unhealthy lifestyle, and sleeve gastrectomy has illustrate regulatory effects on post-operative lipid signs (75% remission in lipid disorders). Significant reductions in total cholesterol, triglyceride and VLDL levels may observed (Kheirvari *et al.*, 2020).

On the other hand, weight loss after sleeve gastrectomy was associated with a significant improvement in several metabolic parameters, liver enzyme levels, and liver histopathology (Salman *et al.*, 2020). Additionally, (Lassailly *et al.*, 2015) demonstrated that fatness or obesity is a risky agent of non-alcoholic fatty liver disease (NAFLD), 85% of patients improved after gastrectomy weight loss and biochemical improvement found in serum of AST, γ -glutamyl transferase, and ALT levels. Likewise, (Cabre *et al.*, 2019) suggested that LSG improves tissue and liver function of morbid obesity patients. The mechanism includes reducing inflammatory processes and oxidative stress.

It is worth noting that the study of (Chang *et al.*, 2017) demonstrated that bariatric surgery might reduce the risk of long-range deterioration of renal function. Bariatric operation seem to be relatively safe in chronic kidney disease CKD patients, with postoperative complications only somewhat greater than in patients with general obesity surgery. However (Nehus *et al.*, 2017) we report that three year kidney outcome in a large group of adolescents undergoing bariatric surgery. Improvement of renal function and albuminuria after weight-loss surgery in these preoperative kidney disease participants. Moreover, levels

of BMI larger than $40 \text{ kg} / \text{m}^2$ upon follow-up estimation were associated with progressively decline in renal function. This fact supports addition of renal impairment as a selection criterion for obesity surgery in adolescents with a BMI of $40 \text{ kg} / \text{m}^2$ to improve it. Additionally, (Cao *et al.*, 2020 ; Khalil *et al.*, 2020) revealed that LSG resulted in a loss of body weight with a significant improvement in values of serum urea and creatinine in obese patients that can concerning to changes in inflammatory agents and adipocytokines, post-surgery. LSG possible to become a new treating, which can cure or prevent renal impairment caused by obesity. Some searchers have showed that there are no significant difference in level of serum creatinine after bariatric surgery (Park *et al.*, 2018).

Others showed that LSG was an effective procedure for obese patients. It prove the beneficial effects of metabolic profile, improvement lipid homeostasis, control of metabolic syndrome and chronic hyperuricemia (Zetu *et al.*, 2020). Whereas (Katsogridaki *et al.*, 2020) indicate that almost half of the group of patients with pre-operative hyperuricemia retained hyperuricemia post-operatively.

Finally, LSG encourage to a further declared decrease in blood TSH level in morbidly obese patients and increased TSH comparing to those with normal thyroid function at 12 months of age. Improvement of inflammatory sings for 12 months after LSG might be correlating with the helpful effect of LSG on thyroid function (Zhu *et al.*, 2019). While it was pointed that Improving of clinical hypothyroidism after laparoscopy sleeve gastrectomy was demonstrated by reducing T4 requirements with similar weight loss to hypothyroid patients at short-term follow up (Elnabil *et al.*, 2017 ; Ozsoy and Kutluturk, 2018). In addition (Barmpari *et al.*, 2019) illustrate that Growth hormone GH levels seem to be improved after bariatric surgery LSG represent long-term effective bariatric surgeries in which weight loss related to the increase in GH levels ameliorates metabolic profile and reduces cardiovascular risk factors in morbidly obese non diabetic patients.

Conclusion:

Bariatric surgery is the most effective treatment option for obesity; however, it does carry significant risks including complications related to the procedure, malabsorption, and hormonal disruption. Pre-operative evaluation and then regular post-operative follow-up by obesity specialist is crucial. Additionally, patients should be aware of the multiple risks and the need for regular evaluation and follow-up by medical professionals.

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