Safety of One-Stage Conversion Surgery After Failed Laparoscopic Adjustable Gastric Banding

Thesis

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By

Abanoub Adel Shafek Awad
(MB Bch) Ain Shams University

Under supervision of

Prof. Dr. Mohammed Abdelmonem Marzouk
Assistant Professor of General Surgery
Faculty of Medicine – Ain Shams University

Dr. Basem Helmy Elshayeb
Lecturer of General surgery
Faculty of Medicine – Ain Shams University

Faculty of Medicine
Ain Shams University
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Abanoub Adel Shafek Awad

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List of Abbreviations

Abb.	Full term
AGB	Adjustable gastric banding
BMI	Body mass index
BPD	Biliopancreatic diversion
BPDDS	Biliopancreatic Diversion with a Duodenal Switch
CT	Computed tomography
DM	Diabetes mellitus
ECG	Electrocardiography
GE	Gastro-esophageal
GI	Gastrointestinal
LAGB	Laparoscopic adjustable gastric banding
LRYGB	Laparoscopic roux-en-Y gastric bypass
LSG	Laparoscopic sleeve gastrectomy
MBP	Mean blood pressure
RYGB	Roux-en-Y Gastric bypass surgery
SAGB	Swedish Adjustable Gastric Band
SASI	Single-anastomosis sleeve ileal bypass
SG	Sleeve gastrectomy
T2DM	Type 2 diabetes mellitus
US	Ultrasound
VBG	Vertical banded gastroplasty

INTRODUCTION

Obesity continues to be a leading public health concern associated with many comorbidities that significantly decrease life expectancy and Surgery remains the only effective treatment modality for morbid obesity, resulting in long-term weight loss and sustained improvement in weight-related comorbidities ***(Jackson et al., 2012).***

According to an article(Health Effects of Overweight and Obesity in 195 Countries over 25 Years published by the new England journal of Medicine, Amongst the 20 most populous countries, the highest level of adult obesity in 2015 was observed in Egypt at 34.9% (32.4-37.3%) ***(GBD 2015 Obesity Collaborators, 2017).***

Overweight and obesity are associated with increased rate of type II diabetes mellitus, hypertension, cardiovascular diseases, dyslipidemia, arthritis, non-alcoholic steatohepatitis, gall bladder diseases, sleep-apnea syndrome and several cancers. Mortality increases with increasing body mass index (BMI). Mortality rate is twelve times than that in young normal-weight men ***(Olshansky et al., 2009).***

Recent reports have described morbid obesity as a continuing epidemic. The failure of various diets to achieve a long-term weight loss has prompted a growing number of

morbidly obese patients to seek surgical treatment ***(Mokdad et al., 2010).***

Treatment must begin with long-term lifestyle changes, including increased physical activity and dietary modifications. For overweight and obese individuals for whom lifestyle changes alone are insufficient, pharmacotherapy may be added. However, patients who choose adjunctive pharmacotherapy should be advised of the risks and benefits of drug therapy, the lack of long- term safety data, and the temporary and modest nature of the weight loss that can be achieved with these agents ***(Cannon and Kumar, 2009).***

Although medical management of morbid obesity patients made some progress, however, a persistent weight reduction can hardly be achieved in these patients. For extreme cases of obesity, only surgical intervention can produce substantial weight loss ***(Weber, 2008).***

Bariatric surgery is a generic term for weight loss surgery. The three most commonly performed bariatric surgery procedures are adjustable gastric banding(AGB), gastric bypass and sleeve gastrectomy(SG). Bariatric surgery is recommended as a treatment option when all appropriate non-surgical measures have been unsuccessful for adults with morbid obesity (body mass index (BMI) 40 kg/m2 or more) or a lower BMI together with other significant disease; it is recommended

as a first-line option for adults with a BMI more than 50 kg/m2 ***(Picot et al., 2009).***

Bariatric surgery procedures are indicated for patients with clinically severe obesity ((BMI) 40 kg/m2 or more with no comorbidities or BMI 35 kg/m2 or more with comorbidities). Currently, these procedures are the most successful and durable treatment for obesity ***(Mechanick et al., 2013).***

Due to its historical popularity, AGB are still present in many individuals. With growing evidence of weight regain or complications, many stand to benefit from band removal and conversion to a stapled bariatric procedure (Lap sleeve gastrectomy as an example) ***(Suter et al., 2006).***

Failure after bariatric surgery is defined as achieving or maintaining less than 60% of excess weight loss (EWL) over 18 to 24 months or a body mass index (BMI) of greater than 35 ***(Parikh et al., 2007).***

Lapasroscopic Sleeve Gastrectomy remains one of the safest and most effective modern surgical options for the treatment of morbid obesity ***(Jackson et al., 2012)***

The therapeutic effect of LSG regarding weight loss is attributed to two main mechanisms; mechanical and hormonal. The mechanical theory states that sleeve gastrectomy leads to reduction in gastric capacity and induces feeling of early satiety, hence decreases the size of meals. In addition, the intact

pylorus exerts a natural band-like effect that enhances the mechanical restrictive effect furtherly ***(Burgos et al., 2009).*** The hormonal theory postulates that removal of the gastric fundus leads to a decline in serum levels of the ghrelin hormone, which is the main stimulant for hunger ***(Márquez et al., 2010).***

In addition to the primary weight-losing effect, LSG tends to cause improvement of several obesity-related comorbidities. According to a recent systematic review ***(Gibson et al., 2013),*** LSG caused improvement of type 2 diabetes mellitus, hypertension, hyperlipidemia, sleep apnea and joint pain ***(Abou Rached et al., 2014).***

As surgeon experience increases with demand for conversions, staging and the type of stapled bariatric procedure performed have both received considerable attention. A 2016 meta-analysis of 11 studies by Dang et al. comparing the two techniques suggested that a one-stage procedure has similar rates of morbidity to two-stage procedures ***(Dang et al., 2016).*** Other large single-center studies have supported the safety and feasibility of one-stage conversion ***(Spaniolas et al., 2017)*** as well as non-inferior morbidity compared to two-stage conversion ***(Carandina et al., 2014).***

Laparoscopic sleeve gastrectomy is a new and effective procedure for the surgical management of morbid obesity.

Therefore, the number of patients undergoing this procedure will continue to rise. Basic understanding of common complications and available treatment options is essential for all practising general surgeons. By early diagnosis and treatment of these complications, patient morbidity and mortality might be reduced ***(Gumbs et al., 2007).***

Aim of the Work

Assessing the safety and outcome of one-stage conversion of failed Laparoscopic adjustable gastric banding (LAGB) to laparoscopic sleeve gastrectomy (LSG).

Chapter 1

ANATOMY

Anatomy of the stomach:

The stomach is readily recognizable as the asymmetrical, pear-shaped, most proximal abdominal organ of the digestive tract ***(Mercer et al., 2002).*** The part of the stomach attached to the esophagus is called the cardia. Just proximal to the cardia at the gastro-esophageal (GE) junction is the anatomically indistinct but physiologically demonstrable lower esophageal sphincter. At the distal end, the pyloric sphincter connects the stomach to the proximal duodenum. The stomach is relatively fixed at these points, but the large mid-portion is quite mobile ***(Ashley et al., 1999).***

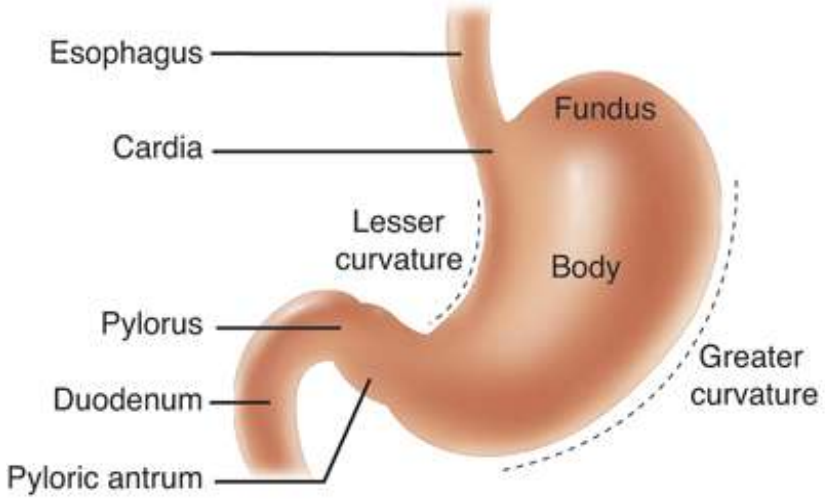

Figure (1): Anatomy of the stomach ***(Ashley et al., 1999).***

The superior-most part of the stomach is the distensible floppy fundus, bounded superiorly by the diaphragm and laterally by the spleen. The angle of His is where the fundus meets the left side of the GE junction. Generally, the inferior extent of the fundus is considered to be the horizontal plane of the GE junction, where the body (corpus) of the stomach begins. The body of the stomach contains most of the parietal (oxyntic) cells, some of which are also present in the cardia and fundus. The body is bounded on the right by the relatively straight lesser curvature and on the left by the more curved greater curvature. At the angularis incisura, the lesser curvature turns rather abruptly to the right, marking the anatomic beginning of the antrum, which comprises the distal 25 to 30% of the stomach ***(Ashley et al., 1999).***

Angular incisure

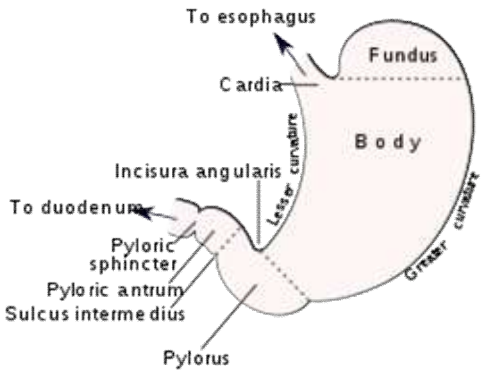

Figure (2): Outline of stomach, with angular incisure stated as "incisura angularis" near center.