Results of Gastrojejunal Plication for Inadequate Weight Loss follow Roux-en-Y Gastric Bypass

Thesis

Meta-Analysis for Partial Fulfilment of Master Degree in General Surgery

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2020

Acknowledgment

First and foremost, I feel always indebted to **ALLAH**, *the Most Kind and Most Merciful.*

I'd like to express my respectful thanks and profound gratitude to **Prof. Dr./Ahmed Mohammed Ibrahim,** *Professor of Bariatric Surgery - Faculty of Medicine- Ain Shams University for his keen guidance, kind supervision, valuable advice and continuous encouragement, which made possible the completion of this work.*

I am also delighted to express my deepest gratitude and thanks to **Dr./ Moheb Shoraby Eskandaros,** *Assistant Professor of General Surgery, Faculty of Medicine, Ain Shams University, for his kind care, continuous supervision, valuable instructions, constant help and great assistance throughout this work.*

I would like to express my hearty thanks to all my family for their support till this work was completed.

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List of Abbreviations

Abb.	Full term
AL	*Alimentary Limb*
AGB	*Adjustable Gastric Band*
ASL	*Anastomotic or Staple line Leak*
ASMBS	*American Society for Metabolic and Bariatric Surgery*
BMI	*Body Mass Index*
BP	*Bilio-pancreatic*
BPD-DS	*Biliopancreatic Diversion with Duodenal Switch*
CAD	*Coronary Artery Disease*
CHD	*Coronary Heart Disease*
CPAP	*Continuous positive airway pressure*
DVT	*Deep Venous Thrombosis*
EBMIL	*Excess Body Mass Index Loss*
EWL	*Excess Weight Loss*
GERD	*Gastroesophageal Reflux Disease*
GGF	*Gastro-gastric Fistula*
GIP	*Gastric Inhibitory Peptide*
GLP-1	*Glucagon-like Peptide 1*
HDL-C	*High Density Lipoprotein Cholesterol*
IWL	*Inadequate Weight Loss*
JJ	*Jejuno-jejunostomy*
LDL-C	*Low Density Lipoprotein Cholesterol*

List of Abbreviations (Cont...)

Abb.	Full term
LPR	*Laparoscopic Pouch Resizing*
LRYGB	*Laparoscopic Roux-en Y Gastric Bypass*
NAFDL	*Nonalcoholic Fatty Liver Disease*
NASH	*Nonalcoholic Steatohepatitis*
NIDDM	*Non-Insulin-dependent Diabetes Mellitus*
NIH	*National Institutes of Health*
OHS	*Obesity Hypoventilation Syndrome*
OSA	*Obstructive Sleep Apnea*
PCM	*Protein Calorie Malnutrition*
PE	*Pulmonary Embolism*
PPS	*Pre-surgical psychological screening*
PR	*pouch Resizing*
ROSE	*Restorative Obesity Surgery Endoscopic*
RYGB	*Roux-en Y Gastric Bypass*
SG	*Sleeve gastrectomy*
T2DM	*Type 2 Diabetes Mellitus*
TORe	*Transoral Outlet Reduction*
WR	*Weight Regain*

B

INTRODUCTION

Obesity is a major global epidemic that forms a significant health threat to humans. The prevalence of obesity is increasing in adults, children and adolescents. Obesity is associated with increased risks for atherosclerotic cerebrovascular disease, coronary heart disease, hyperlipidemia, hypertension, gallbladder disease, and diabetes mellitus, as well as a higher mortality rate ***(Zhang et al., 2014)***.

This high prevalence of morbid obesity worldwide has resulted in the development of many bariatric surgical procedures; which have proven to be more effective for long-term weight loss than non-surgical treatment ***(Buhmann et al., 2014).***

Bariatric surgery has become the standard treatment for morbidly obese subjects; as it leads to significant weight loss and control of comorbidities in most cases.

Bariatric Surgery reduces cardiovascular risk factors including hypertension, lipid disturbance, non-alcoholic fatty liver, diabetes and cancers ***(Saur Svane and Madsbad, 2014).***

Roux-en-Y gastric bypass (RYGB) is considered the gold standard procedure of bariatric surgery ***(León et al., 2015).***

Despite the validity of weight loss and comorbid condition remission after RYGB, 15 to 25% of patients fail to lose sufficient weight ***(León et al., 2015).***

Revisional Surgery is used for weight loss failure/regain (percentage of excess weight loss %EWL <50% after RYGB) ***(Leon et al., 2015).*** Inadequate weight loss has been reported to be as great as 25–35 % of initial excess weight loss and typically occurs within 2–7 years after RYGB surgery ***(Hamdi et al., 2014).***

Possible causes of failure for gastric bypass include a dilated pouch, a dilated gastro-jejunal anastomosis, rupture of a restrictive ring, and a gastro-gastric fistula ***(Ferraz et al., 2014).*** Pouch and/or anastomosis enlargement resulting in lack of restriction is the most common reason for failure ***(Nguyen et al., 2015).***

Various revisional options have been suggested including increasing malabsorption by lengthening the alimentary limb (revision of RYGB to distal bypass) or re-establishing restriction. In the latter category, the options include trimming of gastro-jejunal anastomosis and/or pouch, complete reconstruction of gastric pouch and anastomosis, placement of adjustable gastric band and endoscopic suturing to reduce pouch size and stoma diameter ***(Nguyen et al., 2015).***

Pouch enlargement resulting in lack of restriction is the most common reason for failure ***(Nguyen et al., 2015).***

Gastrojejunal stoma diameter >2cm is associated with 32-57% weight regain ***(Elbahrawy et al., 2017).***

Therefore, gastric pouch revision entails reduction of dilated gastric pouch by a partial pouch resection, re-doing the anastomosis and keeping the stoma size at 1.5cm or less ***(Tran et al., 2016).***

Also various factors affect weight regain including behavioral, dietary, psychological elements ***(Nguyen et al., 2015).***

Revisional procedures for failed RYGB are known to be technically challenging given the potential of distorted planes and anatomic changes. In fact, stapled revisional bariatric surgery has been associated with higher rates of complications and questionable efficacy when compared with primary operations ***(Elnahas et al., 2014).***

AIM OF THE WORK

Our objective in this study is to assess the effectiveness of Gastro-jejunal stomal plication for inadequate weight loss following Roux-en-Y gastric bypass surgery in patients with stoma wider than 2 cm .

Chapter 1

DEFINITION & ETIOLOGY OF MORBID OBESITY

The word "obesity" is originally derived from the Latin "to overeat"; the modern purist's definition is "a disease of excess body fat". This definition is important for two reasons; it unequivocally characterizes the condition as a disease not a character flaw, cosmetic aberration or personality disorder; and it associates the disease with body fat not body weight, desirable weight or size ***(Klein, 2001).***

There is a consensus between international organization and world experts that obesity is a disease of epidemic proportions that affects the normal function and implies ill-health ***(Campbell and Haslam, 2005).***

Obesity is usually defined using the Body Mass Index BMI= weight (in kg) / height (in m^2). Generally speaking, a BMI $\geq$30 kg/m^2 defines a state of obesity; while $\geq$40 kg/m^2 is defined as severe or morbid obesity ***(Campbell and Haslam, 2005).***

Etiology of Obesity

At its simplest, obesity is caused by an excess of energy intake over energy expended. Any excess energy intake over and above an individual's daily requirement will result in that energy being stored. Energy is stored as fat and deposited viscerally and subcutaneously ***(Dhurandhar and Keith, 2014).***

The current obesity epidemic is known to have coincided with profound societal changes involving both physical activity levels and food consumption patterns as well as demographic and cultural changes affecting the conduct of human beings in various ways.

On the other hand, obesity is a complex and multifactorial chronic disease that usually becomes manifest in child hood and adolescence. Its origin is a genetic and environmental interchange, of which environmental or behavioral factors play the most important role, stemming from an imbalance between energy intake and expenditure ***(Serra-Majem and Bautista-Castaño, 2013).***

Still and all, it is rather simplistic to assume that obesity is only due to excessive consumption and/or deficient physical activity levels. Currently, various lines of investigation have been initiated that evaluate the determinants of obesity, of which nutrigenomics and gut microbiota deserve special attention ***(Serra-Majem and Bautista-Castaño, 2013).***

Chapter 2

GASTRIC BYPASS SURGERY FOR MANAGEMENT OF MORBID OBESITY

History of Gastric Bypass Surgery

The gastric bypass was based on the weight loss observed among patients undergoing partial stomach removal for ulcers ***(Dan and Lynch, 2015).***

The main modification was that, unlike the antrectomy in the Billroth II reconstruction used by Wangensteen for peptic ulcer disease, the newer technique left the gastric antrum in place **(Fig. 1).** Following animal experimentation in dogs, Mason and Ito performed the first gastric bypass procedure on May 10, 1966, on a 50-year-old woman with a BMI of 43 kg/m2, whose morbid obesity was believed to play a major role in the failure of numerous ventral hernia repairs. This was the first report of a restrictive component to a bariatric operation ***(Mason and Ito, 1969; Dan and Lynch, 2015).***

The stomach was divided creating a 100 mL horizontal, proximal gastric pouch to which a loop gastrojejunostomy was constructed. Later, Mason and colleagues reduced the pouch size to <50 mL to increase weight loss and reduce the frequency of anastomotic ulcer formation ***(Dorman and Ikramuddin, 2012).***