

Types and Complications of Bariatric Surgery

An Essay

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In General Surgery

By

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(قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا
إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ
الْعَلِيمُ الْحَكِيمُ)

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List of Contents

	<i>Page</i>
1. Introduction and Aim of the Work.....	1
2. Review of literature	
• <i>Chapter (1): Anatomy</i>	4
• <i>Chapter (2): Pathophysiology</i>	24
• <i>Chapter (3): Indications</i>	43
• <i>Chaper (4): Types of surgery</i>	50
• <i>Chapter (5): Complications</i>	85
3. Summery	141
4. References	145
5. Arabic Summery	_

List of Figures

Figure No.	Comment	Page No.
Fig. (1)	Structures situated on the posterior abdominal wall behind the stomach	7
Fig. (2)	The arterial supply of the stomach	8
Fig. (3)	Tributaries of the portal vein.	10
Fig. (4)	Lymph drainage of the stomach.	11
Fig. (5)	Distribution of the anterior and posterior vagal trunks within the abdomen	11
Fig. (6)	Posterior relations of the duodenum and the pancreas	14
Fig. (7)	Superior mesenteric artery and its branches	22
Fig.(8)	The adjust gastric band	53
Fig. (9)	Lap-Band placed at the very top of stomach	53
Fig. (10)	Lap band surgical technique	55
Fig. (11)	Wedge laparoscopic vertical banded gastroplasty	58
Fig. (12)	Mason-like laparoscopic vertical banded gastroplasty	58
Fig. (13)	Opening the omental bursa	61

Fig. (14)	Insertion of a 32-french gastric tube in the stomach	61
Fig. (15)	The Laparoscopic Biliopancreatic Diversion	65
Fig. (16)	Schematic of the duodenal switch operation as described by Hess	68
Fig. (17)	Gastric bypass.	70
Fig. (18)	The ligament of Treitz is identified	71
Fig. (19)	Division of the jejunum.	71
Fig. (20)	The ultrasonic shears create small bowel enterotomies.	72
Fig. (21)	Upward traction on the shaft of the linear stapler	72
Fig. (22)	Retraction for the hepatogastric dissection	73
Fig. (23)	The first bite of stomach is divided with the linear stapler.	73
Fig. (24)	the connection of the stapler with the tip of the anvil	74
Fig. (25)	The anvil in position after traversing the stomach	75
Fig. (26)	The circular stapler is prepared to fire.	75
Fig. (27)	Diagrammatic illustration of laparoscopic mini-gastric bypass.	80

Fig. (28)	Diagram and intra operative picture of completed GCP procedure	83
Fig. (29)	Endoscopic image of plicated gastric greater curvature	83
Fig. (30)	Endoscopic retroflex views of the gastro-esophageal junction demonstrating 180° erosion of band	107
Fig. (31)	Laparoscopic photograph of a dilated pouch proximal to a slipped band	110
Fig. (32)	View of gastrojejunostomy leak	122
Fig. (33)	Endoscopic view of gastrojejunal anastomosis of RYGB patient who developed overt GI bleeding	128
Fig. (34)	Endoscopic view of gastrojejunal anastomosis of RYGB patient who developed overt GI bleeding	129
Fig. (35)	Endoscopic view of a marginal ulcer at the gastrojejunal anastomosis	134
Fig. (36)	An internal hernia can potentially occur through either two or three defects.	135
Fig. (37)	CT scan image of internal hernia through Peterson's space with dilated jejunum	136

List of Tables

<i>Table No.</i>	<i>Comment</i>	<i>Page No.</i>
Table (1)	Summary of patient selection criteria	46
Table (2)	The Edmonton obesity staging system	48
Table (3)	Various sites of absorption of nutrients in the body	91
Table (4)	Short and long terms complications after primary MGB	139

List of Abbreviations

CN X	Cranial nerve number 10
ARDS	Acute respiratory distress syndrome
ASO	Acute Stoma Obstruction
AT	adipose tissue
ATMs	adipose tissue macrophages
BIB	BioEnterics Intra gastric Balloon
BMI	Body mass index
BPD	bilio-pancreatic diversion
BPL	biliopancreatic limb
CL	common limb
CT	computed tomography
CV	Cardiovascular
DEXA	dual energy X-ray absorptiometry
DNA	Deoxy ribo nucleic acid
DVT	Deep venous thrombosis
ECG	Electro cardiography
EEA	Enteroenterostomy anastomosis
EOSS	Edmonton Obesity Staging System
ERV	expiratory reserve volume
EWL	excess weight lost
F	French
FRC	Functional residual capacity
GBP	gastric bypass procedure
GC	greater curvature
GEA	gastroentero-anastomosis
GERD	gastro esophageal reflux disease

GI	Gastro intestinal
GIA	gastrointestinal anastomosis
GIB	gastrointestinal bleeding
GIP	Glucose-Dependent Insulinotropic Peptide
GLP-1	Glucagon-like peptide-1
HDL	high density lipoprotein
IAP	Intra abdominal pressure
IBW	ideal body weight
ICV	ileocecal valve
IF	intrinsic factor
IU	International unit
JGA	juxta-glomerular apparatus
JI	jejunoileal
LAGB	Laparoscopic adjustable gastric band
LBPD-S	Laparoscopic Biliopancreatic Diversion with Duodenal Switch
LC	lesser curvature
LDL	low-density lipoprotein
LGCP	Laparoscopic greater curvature plication
LGP	laparoscopic gastric plication
LRYGB	laparoscopic Roux-en-Y gastric bypass
LSG	Laparoscopic sleeve gastrectomy
LVBG	laparoscopic Vertical banded gastroplasty
MCP	monocyte chemotacticprotein
MGB	Mini-gastric bypass
MO	Morbid obesity
NALD	nonalcoholic liver disease
NASH	non-alcoholic steatohepatitis
NIH	National Institutes of Health
NSAIDs	Non steroidal anti-inflammatory drugs
OSA	obstructive sleep apnea

<i>PE</i>	pulmonary embolism
<i>PPI</i>	proton pump inhibitors
<i>pSEMS</i>	partially covered self-expanding metal stents
<i>PTH</i>	parathyroid hormone
<i>PYY</i>	Peptide YY
<i>RDI</i>	respiratory disturbance index
<i>RNA</i>	Ribo nucleic acid
<i>SAS</i>	Sleep Apnea Syndrome
<i>T2DM</i>	Type 2 diabetes mellitus
<i>TIBC</i>	Total Iron Binding Capacity
<i>UDCA</i>	ursodesoxycholic acid
<i>UGH</i>	Upper gastro intestinal hemorrhage
<i>UGI</i>	Upper gastro intestinal
<i>VBG</i>	Vertical banded gastroplasty
<i>VSG</i>	Vertical sleeve gastrectomy
<i>WAT</i>	White adipose tissue
<i>WLS</i>	weight loss surgery
<i>WT</i>	working trocar

INTRODUCTION

Obesity is a serious worldwide health problem. It has been shown to predispose to various diseases, particularly cardiovascular disease, diabetes mellitus, sleep apnea, and osteoarthritis (*X. Li et al., 2008*).

The increasing prevalence of obesity-related morbidities represents a significant health problem, especially for individuals in modern Western societies (*Yermilov et al., 2009*).

The Society of American Gastrointestinal Endoscopic Surgeons (SAGES) therefore recommends that surgical therapy should be considered for individuals who:

- Have a body mass index (BMI) $> 40 \text{ kg/m}^2$
- Have a BMI $> 35 \text{ kg/m}^2$ with significant co morbidities

The indications for laparoscopic treatment of obesity are the same as for open Surgery (*J D Adair et al., 2008*).

Bariatric operations are classified as purely malabsorptive, purely restrictive, or combined malabsorptive-restrictive (*D E Swartz et al., 2008*).

Restrictive procedures include; laparoscopic adjustable gastric band (LAGB), laparoscopic sleeve gastrectomy (LSG) and vertical banded gastroplasty (VBG). Malabsorptive

procedures include; bilio-pancreatic diversion (BPD) and bilio-pancreatic diversion with duodenal switch (BPD-DS). The laparoscopic Roux-en-Y gastric bypass (LRYGB) is considered a combination of both restriction and mild mal-absorption (**H.A. Khwaja, 2010**).

Early complications of these operations can include bleeding, infection, leaks from the site where the intestines are sewn together, and blood clots in the legs that can progress to the lungs and heart (**Niddk, 2009**).

Examples of complications that may occur later include strictures (narrowing of the sites where the intestine is joined) and hernias (**Niddk, 2009**).

Bariatric surgery is a metabolic surgery designed to produce malnutrition. Energy deficit occurs due to low food intake, food intolerance, and nutrient malabsorption (**Ampadi Thampi et al., 2008**).

Approximately 30% of bariatric surgery patients will develop a nutrition-related complication, typically a macronutrient or micronutrient deficiency or both, at some point following their operation (**Fujioka et al., 2011**).

AIM OF WORK

The aim of this essay is discussion of different types and procedures of morbid obesity surgery and their complications.

CHAPTER (1): ANATOMY

ANATOMY OF THE STOMACH

The stomach is roughly J-shaped, although its size and shape vary considerably. It tends to be high and transverse in the obese short subject and to be elongated in the asthenic individual. (*Harold Ellis, 2006*)

The stomach has two surfaces—the anterior and posterior; two curvatures — the greater and lesser; and two orifices the cardia and pylorus. (*Harold Ellis, 2006*)

The surface of the stomach facing the front is the anterior wall of the stomach that facing the back is the posterior wall of the stomach. The upper border of the stomach at the junction of the anterior and posterior walls is concave, shorter, and forms the lesser curvature of the stomach. The lower border forming the lower junction of the walls of the stomach is convex and longer and is the greater curvature of the stomach. (*R.D.Sinelnikov, 2003*)

PARTS OF THE STOMACH:

The stomach is divided by arbitrary lines drawn on its external surface into a fundus, body, pyloric antrum and pylorus. The internal appearance and microstructure of these regions varies to some degree. The fundus is dome shaped and