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Role of Multi Detector Computed Tomography in Assessment Of Early Post-Operative Complications in Sleeve Gasterectomy in Bariatric Patients

Thesis
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List of abbreviations

Vocabulary	Meaning
AP	Antro-posterior
BMI	Body mass index
CHD	Common hepatic artery
CAT	Computed axial tomography
CT	Computed tomography
CHD	Coronary heart disease
GDA	Gastro-duodenal artery
GERD	Gastro-esophageal reflux disease
HDL	High density lipoprotein
KG/M	Kilogram / meter
LAGB	Laparoscopic adjustable gastric bandage.
LSG	Laparoscopic sleeve gasterectomy
LGA	Left gastric artery
LES	Lower esophageal sphincter
MDCT	Multi-detector computed tomography
MSCT	Multi-slice computed tomography
PV	Portal vein
PVT	Portal vein thrombosis
POD	Post operative day
PMC	PubMed central
RGV	Residual gastric volume
RGV	Residual gastric volume
RGA	Right gastric artery
RYGB	Roux –en- y gastric bypass
SPSS	Statistical package for the social science
UK	United kingdom
USA	United states of America
UGIs	Upper gastrointestinal gastrographin swallow studies
WC	Waist circumference
WHR	Waist to hip ratio
WHO	World health organization.

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Introduction

Morbid obesity is increasing worldwide, and levels of obesity are higher frequently and associated with increasing risk of co-morbidities and death ***(Irene et al., 2015).***

Obesity still a worldwide illness of rising incidence with a terrifyingly widespread magnitude. A large group of adult populations usually involved, and have become a part of major fitness challenges of contemporary world. Obesity as an illness recognized and measured by WHO by mass index of the human body. BMI over 40kg/m^2 is well-defined as morbid obesity**. *(Bhurosy and Jeewon, 2014).***

Bariatric patients are related to increase chance of difference disease existence and increase death rate. These diseases affecting heart and circulatory system for example (MI), central nervous system for example (stroke), the incidence increases furthermore on obese patients than patients with ideal weight ***(Bhurosy and Jeewon 2014).***

Obesity isn't solely leading to difference disease existence and increasing death rate, however conjointly life style excellence (the person's physical health, psychological condition and social relationships) (***Jepsen et al., 2015).***

Surgical management for bariatric patients started at the 2nd half of the twentieth century. Surgical management for bariatric patients classified into 3 categories:

Mal-absorptive, restrictive, as well as mixed**.** Aim of these surgeries was to reach early satiety by decrease stomach capacity and appetite. Recently, Laparoscopic sleeve gastrectomy (LSG) has a great popularity as a 1ry operation for the treatment of morbid obesity ***(Benaiges et al., 2015).***

The laparoscopic sleeve gastrectomy (LSG) is a restrictive bariatric operation which produce subtotal gastric restriction of the fundus and body to create a long tubular gastric conduit. The aim of this operation was to reach early satiety by decreasing stomach capacity and lowering appetite ***(Chang et el., 2014)***

Radiological assessment is important in the 1st postoperative period to rule out initial complications. the usually used radiological procedures are gastrografin swallow and meal studies as well as multi-detector spiral CT scan ***(Kourosh et al.,2013).***

LSG complications are classified as early postoperative complications (<30 days after operation) and late post-operative complications (>30 days after operation). Examples of early post-operative complications are staple line leakage, wound infection, abscess formation, gastric pouch stenosis and gastric fistula. Examples of late post-operative complications includes: dilatation of the gastric pouch and weight gain ***(raiz et al., 2016).***

The main and important complication after LSG operations are leaks. categorized to early noted at 1st to 3rd days after operation, intermediate, occurring on the 4th to 7th days after operation, and late, happens after the 8th day after operation. Leaks as well categorized by their cause to ischemic leaks and staple line failure leaks ***(safadi et al., 2015).***

CT examinations are perfectly done with oral and IV contrast agent. Because of the high girth of bariatric patients, it may be essential to adjust technical factors such as Kilo-voltage, mill-amperage, field of view, and collimation thickness. Computed tomography (CT) of the abdomen is considered as a part of diagnostic Process of patients with suspected leak and presence of abdominal fluid collection or free fluid, passage of contrast into the abdominal cavity or the drain tube or presence of pneumoperitonum are the diagnostic findings of leakage or fistula ***(Marc and laurance, 2014).***

Aim of the work

The aim of this study was to assess the role of Multi Detector CT in assessment of early post-operative complications of sleeve gastrectomy mainly leakage, which has an essential diagnostic value in determining appropriate patient management.

Anatomy of Stomach

stomach is that the markedly expanded portion of alimentary pathway, situated underneath the left diaphragmatic copula within its related left hypo-chondrial region as well as epi-gastric region. The stomach has a tubular appearance, it has posterior and anterior walls, medial and lateral curvatures, it also has 4 parts termed from distal to proximal pylorus, body, fundus, and cardia (Cottam et al, 2006).

The location and configuration of the stomach intimately related to organogenesis. if growing defects of the stomach or surrounding viscera, their vessels (arteries and veins), nerves and peritoneum occur, it may follow the stomach morphology. last structure and shape changed according to age of the person, body built of the person, whats the stomach filled with as well as surrounding viscera size and shape. Any unusual fluid collection in serious cavities may affects stomach configuration too ***(Chen et al, 2009).***

Heavily body build persons with short thorax and long abdomen usually has transversely located and highly placed stomach. a slim individual in contrast has vertically located and lower sited stomach ***(Ferrer-Márquez et al, 2012).***

Gross Anatomy

The gastro-esophageal junction:

The abdominal esophagus reaches the stomach at an acute angle called "Cardiac notch" or "The angle of His" created between the cardia and esophagus. It forms a valve, stopping reflux of the stomach acid and the duodenal bile and from reaching the esophagus. The angle of insertion of the esophagus is more acute in expiration than in inspiration, but this angle is not absolutely affected by feeding ***(Curcic et al., 2010).***

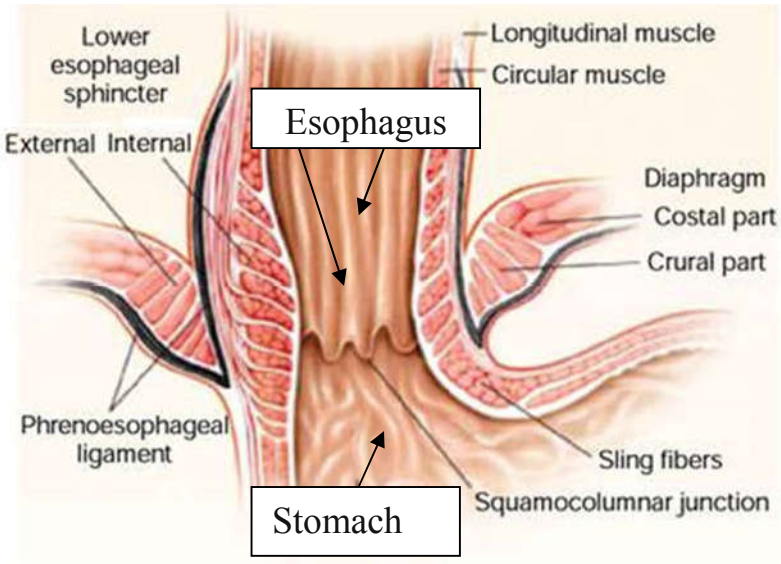

Figure (1): Gastro-esophageal junction region diagrammatic illustration showing esophagus and stomach (***Mittal, 2011).***

At the gastro-esophageal junction, there is the lower esophageal sphincter (LES). Its function is to avoid the backward passing of gastric juice to lower part of esophagus. Yet if LES affected by sustained relaxation, hypotonia or anatomic disruption such as a hiatal hernia, gastro-esophageal reflux of different severities be able to occur ***(Han et al, 2005).***

Cardia:

Cardia is the site where the esophageal contents passed into the stomach. The cardia is defined as the region following the "Z-line" of the gastro-esophageal junction, the site at which the epithelium changes from stratified squamous epithelium to columnar epithelium ***(Han et al, 2005).***

Fundus:

Understanding anatomy of the fundus clarifies sure problems after surgery, few “unsatisfactory” radiological findings after surgeries .in the circumstance of bariatric gastric surgeries as it is crucially to wholly release the fundus to form a slender gastric conduit. All parts of stomach enclosed by peritoneum sparing GEJ, cardia and fundus upper part which is positioned above the omental bursa (retro-peritoneal) ***(Deguines et al, 2013).***

The peritoneal relations of the fundus are the omental bursa posteriorly and inferiorly, the gastro-splenic ligament on the left and the gastro-phrenic ligament superiorly. Its muscle relations are the diaphragm superiorly and posteriorly and left pillar of diaphragm medially. It present directly related anteriorly to hepatic left lobe, laterally to splenic hilum ***(Deguines et al, 2013).***

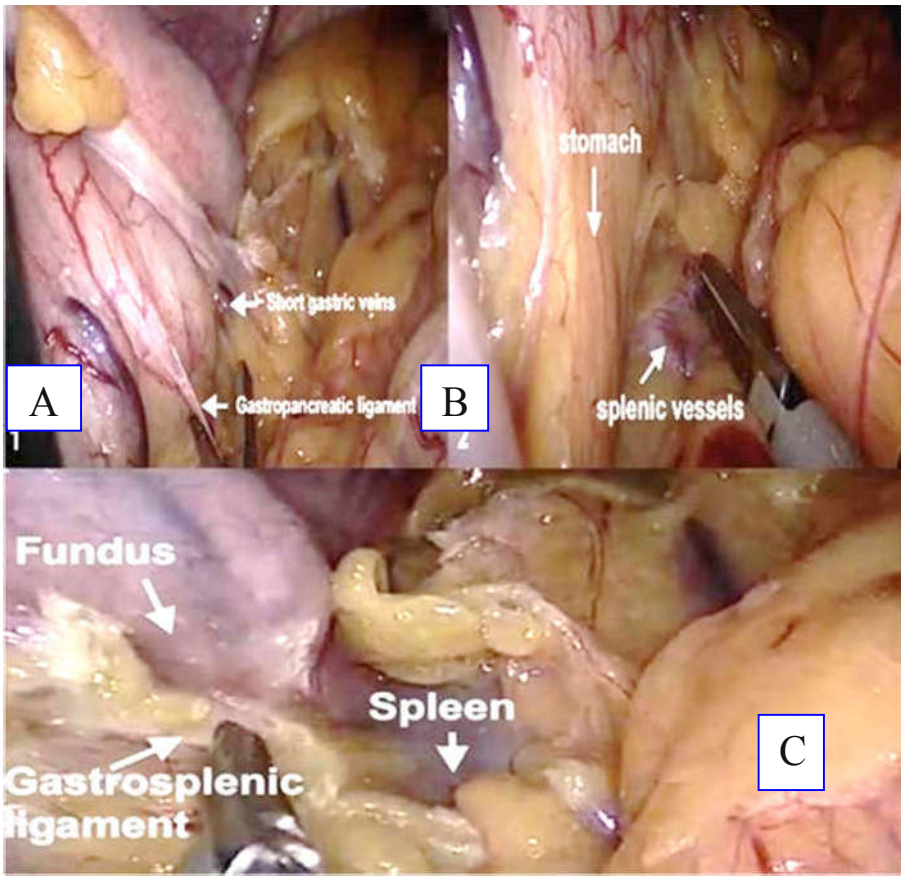

Figure (2): Intra-operative laparoscopic view of gastric fundus and its relations: short gastric veins in A image, stomach and splenic vessels in B image, spleen and fundus in C image. (***Deguines et al, 2013).***