Management of Leakage After Bariatric Procedures

Essay

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List of Abbreviations

Abb.	Full term
AP	*Anterior surface plication*
ASL	*Anastomosis and staple line leak*
ASMBS	*The American Society for Metabolic and Bariatric Surgery*
BGBP	*Banded gastric bypass*
BMI	*Body Mass Index*
BPD	*Bilio-Pancreatic Diversion*
CSA	*Circular stabled anastomosis*
CT	*Computerized topography*
DS	*Duodenal switch*
EWL	*Excess weight loss*
GCP	*Greater curvature plication*
GERD	*Gastroesophageal reflux disease*
GJA	*Gastrojejunal anastomosis*
LABS	*Longitudinal Assessment of Bariatric Surgery LAGB Laparoscopic Adjustable Gastric Banding LGCP Laparoscopic greater curvature plication*
LGP	*Laparoscopic Gastric Plication*
LRYGB	*Laparscopic Roux-en-y gastric bypass*
LSA	*Linear stapled anastomosis*
LSG	*Laparoscopic Sleeve Gastrectomy*
MGB	*Mini gastric bypass*
MRI	*Magnetic resonant imaging*
OSA	*Obstructive sleep anea*
RYGB	*Roux-en-y gastric bypass*
SEMS	*Self expanded metalic stent*
SLR	*Staple line reinforcement*
TPN	*Total parenteral nutrition*
TVGP	*Total Vertical Gastric Plication*
UGI	*Upper gastrointestinal*
VBG	*Vertical Banded Gastroplasty*
	VSG Vertical Sleeve Gastrectomy

Abstract

Treatment often depends on the clinical situation present. If the leak is well contained and the patient is haemodynamically stable, the patient can be treated conservatively with nothing per mouth percutaneous drainage, intravenous antibiotics, and intravenous nutrition. If the leak is not well contained and the patient is haemodynamically stable, laparoscopic exploration or stent via endoscope or intervention radiology is warranted. If the patient is haemodynamically compromised, open exploration should be performed. During exploration, whether open or laparoscopic, there are 3 principles that must be addressed at the time of exploration: repair of the leak, drain placement, and placement of gastrostomy tube in bypassed stomach.

There are important measures to decrease the incidence of leakage, surgeon preparation is an important key to success with this challenging, advanced laparoscopic procedure. The surgeon must be familiar with management of a bariatric patient, including appropriate indications for surgery, preoperative evaluation, perioperative management, and long term follow up care. Advanced laparoscopic skills, including two handed technique and laparoscopic stapling and suturing, are required. Both fundamentals of bariatric surgery and advanced laparoscopic surgery should be mastered before performing laparoscopic surgery, several intraoperative techniques have been implanted to prevent the anastomosis leak. These interventions include intraoperative pneumatic testing, the use of linear staplers with shorter stapler height, oversewing of staple line, use of omental wrap, and measures designed to reinforce staple line, such as fibrin glue, peristrips, seamguard, bovine pericardium and various other staple line reinforcement material.

Keywords: *Laparoscopic Sleeve Gastrectomy- Mini gastric bypass- Obstructive sleep anea Self expanded metalic stent- Staple line reinforcement*

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. The mortality rate from obesity exceeds 400, 000 patients a year, and obesity is considered to be the second cause of preventable death after cigarette smoking. It is estimated that the annual cost spent on the treatment of obesity and obesity-related health problems exceeds $100 billion ***(Xingxiang et al., 2008).***

Bariatric surgical procedure reduce caloric intake by modifying the anatomy of the gastrointestinal tract, these operations are classified as either restrictive or malabsorptive, restrictive procedures limit intake by creating a small gastric reservoir with a narrow outlet to delay emptying, malabsorptive procedures bypass varying portions of the small intestine where nutrient absorption occurs ***(Collazo-Clavell et al., 2006).***

Restrictive operations as laparoscopic adjustable gastric banding (LAGB), sleeve gastrectomy (LSG), gastric plication and vertical banded gastroplasty (VBG). Malabsorptive operations as biliopancreatic diversion (BPD), jejunoileal bypass (JIB). Combined restrictive and malabsorptive operations as Roux-en- Y gastric bypass (RYGB), gastric minibypass and biliopancreatic diversion with duodenal switch (DS).The most commonly performed procedures are gastric

banding, Roux-en-Y gastric bypass, sleeve gastrectomy, and biliopancreatic diversion ***(Colquitt et al., 2009).***

Average bariatric surgical complication rates are less than 10%. Post-operative morbidity can be in the form of postoperative bleeding, GERD, reflux, nausea, vomiting, obstruction, perforation, dilatation, inadequate weight loss, beaded stricture and axial rotation ***(Shah, 2011).***

Anastomotic or staple line leak is one of the early complications of bariatric surgeries. The clinical presentation can be quite insidious and a high degree of suspicion is required by the physician. Sustained tachycardia (especially a sustained heart rate of >120 beats per minute), tachypnea, and fever raise the suspicion ***(Papasavas et al., 2003)***.

The key to management of a leak is early diagnosis. Treatment started conservatively by insertion of Ryle, nothing per mouth (NPO), total parenteral nutrition (TPN), put a Drain either ultrasound guided or CT guided, endoscope using stent or mega clips. If all failed, surgical intervention the source of leak should be identified and repair should be attempted, using adjacent bowel or omentum to buttress the repair if at all possible. Injection of methylene blue via tube may reveal the leak intraoperative. Wide drainage of the area of leak is essential. Closed suction drain is recommended ***(MacDonald et al., 2008).***

Aim of the Work

Is to discuss diagnosis and treatment of leakage in patients after bariatric surgeries and to improve the morbidity and mortality.

OBESITY AND BARIATRIC SURGERIES

Obesity is the second leading cause of preventable death after smoking. Annually, obesity-related diseases account for 400,000 of premature deaths ***(Fontaine et al., 2008)***.

It is formally recognized by the WHO as a global epidemic in 1997, it was estimated that in 2008, 1.5 billion adults, twenties and older, were overweight. Over 200 million men and nearly 300 million women were obese, with higher rates among women than men.

The rate of obesity also increases with age, at least up to 50 or 60 years old. Severe obesity in the United States, Australia, and Canada is increasing faster than the overall rate of obesity.

Obesity rates are rising worldwide and affecting both the developed and developing world ***(Rucker et al., 2007).***

Concurrently research on factors regulating obesity as well as the possible treatments has been ongoing, with bariatric surgery making the greatest forward moves and providing the means for better understanding of the metabolic and endocrinal parameters involved in weight gain and weight loss ***(Tsigos et al., 2008).***

Classifications and definitions of obesity:

Although several classifications and definitions for degrees of obesity are accepted, the most widely accepted is the World Health Organization (WHO) criteria based on BMI. Body Mass Index (BMI) is calculated by dividing a person's weight (in kilograms) by height (in meters squared) ***(Ayloo et al., 2012).***

Under this convention for adults, individuals whose BMI is less than 18.5 kg/m2 are considered as underweight whereas those whose BMI ranges from 18.5 to 24.9 kg/m2 are classified as having normal or accepted weight. Those with BMI ranges from 25 to 29.9 kg/m2 are commonly called overweight. Obesity is said to be present when BMI is more than 30 kg/m2. There are three grades of obesity (table 1):

- **Grade 1:** BMI ranging from 30 to 34.9 kg/m2.
- **Grade 2:** BMI ranging from 35 to 39.9 kg/m2.
- **Grade 3:** BMI >40kg/m2.

Table (1): BMI dependent WHO obesity classification.

BMI kg/m2	Obesity Class	
<18.5		**Underweight**
18.5–24.9		**Normal**
25–29.9		**Overweight**
30.0–34.9	I	**Obesity**
35.0–39.9	II	
40.0	III	**Extreme Obesity**

(Ayloo et al., 2012)

Waist circumference is used also as a measure of abdominal adiposity, waist circumference is the minimum circumference between the costal margin and iliac crest, measured in the horizontal plane, with the subject standing. Hip circumference is the maximum circumference in the horizontal line, measured over the buttocks**.** The ratio of the former to the latter provides an index of the proportion of intra-abdominal fat. The average value for men is about 0.93 with a range of 0.75 to 1.10, and for women 0.83 with a range from 0.70 to 1.00 ***(Flier and Flier, 2008).***

The definition of obesity in children involves BMIs greater than the 85th percentile (commonly used to define overweight) or the 95th percentile (commonly used to define obesity) for age-matched and sex-matched control subjects ***(Shiwaku et al., 2004)***.

Morbid obesity is one of the major health problems of the 21st century which has a steadily increasing incidence, with approximately 10% of the world‘s population meeting the previously mentioned criteria ***(Gill et al., 2010)***.

Surgical management of obesity

Management of Obesity can be done by many possible ways like diet regimens, physical exercises, pharmacological,

surgical management (Bariatric Surgery) or combinations of any of them together.

Current medical therapies for the obesity remain inadequate and bariatric surgery is more effective in achieving weight loss in adults with obesity than nonsurgical weight loss interventions and because of that bariatric surgery is currently the only effective treatment for morbid obesity ***(Buchwald et al., 2009).***

Numerous studies have reported that bariatric surgery is a cost-effective weight loss intervention compared with onsurgical treatment of obesity, although the variability in estimates of costs and outcomes is large ***(Keating et al., 2009)***.

Surgical management includes: purely restrictive operations which lead to a reduction of the food intake by a small gastric pouch. Other interventions combine this effect with a malabsorption of micronutrients (proximal gastric bypass) and/or macronutrients (distal gastric bypass and Biliopancreatic diversion). Purely malabsorption procedures, such as jejunoileal bypass, have been abandoned due to severe side effects ***(Gumbs et al., 2007).***

Gastric restrictive procedures currently include laparoscopic adjustable gastric banding and sleeve gastrectomy, but the placement of an implantable device or the irreversible