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Laparoscopic sleeve gastrectomy without drain in morbidly obese patient

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Abstract
Aim of the study: to prove that the laparoscopic sleeve gastrectomy (LSG) can be safely done without placement of post-operative intraperitoneal drains.
Introduction: There is no doubt that the bariatric surgery without placement of postoperative intraperitoneal drains are more comfortable for the patients, The surgeons changes his surgical practice with progress in the bariatric surgery technique and instruments and diagnostic tools that able them for early detection and diagnosis of complication after bariatric surgery that render them does not use drains rottenly post laparoscopic sleeve gastrectomy. Placement of drains does not facilitate detection of staple line leak, abscess, or bleeding.
Patients and Methods: 100 patients (80 Female and 20 Male), who underwent LSG in at the AL-Azhar university hospitals and other certified hospitals from Sept. 2014 to Sept. 2016 were done, All operations were performed from the same operative team and laparoscopic sleeve gastrectomy were done without placement of intraperitoneal drain.
Results: Operation time range from 25-50 minutes median 37.5 minutes, Intraoperative One case of liver injuries due to lever retractor managed by haemostatic sponge application, 3 cases of stable line bleeding managed by suture and omental wrap. No cases of leaks. One case of intrapertoneal small hematoma at day 9 detected by ultrasound, managed by ultrasound guided aspiration once only, 3 pulmonary infection occurs in x-smoker patients, 3 cases wound infection treated by local debridement and antibiotics. The overall 24-hour postoperative pain score from 0-7 with a median of 3, 5.
Discussion: Certain surgeons currently believe that routine drainage can increase the incidence of intra-abdominal and wound infections, exacerbate abdominal pain, reduce lung function, and prolong hospitalization. Placement of drains does not facilitate detection of staple line leak, abscess, or bleeding. Management of surgical patients should improve and surgeons should be able to practice based upon sound scientific principles. Lack of definitive evidence has not helped the resolution of some controversial issues surrounding the use of surgical drainage, our strategy is the early discharge strategy to follow these patients for only the first 2 days in hospital, he get a gastrografin swallow study on 2nd postoperative day to exclude leak before liquid fluid (water) diet is commenced If tolerated fluid diet started.. Whether this strategy provides many advantages. Gastric leaks can be diagnosed either incidentally on a routine upper gastrointestinal series performed postoperatively without any clinical signs. a combination of clinical signs of fever, tachycardia and tachypnea was found to be sensitive and specific for detection of anastomotic leaks. Laparoscopic sleeve gastrectomy without placement of intrapertoneal drian may contribute to a faster recovery, shorter hospital stay, and reduced costs without causing additional surgical complications. And may contribute to early discharge from the hospital, which also reduces costs.
Conclusion: Laparoscopic sleeve gastrectomy without drains are safe and It also has the added benefits of the patients satisfaction, it follow the evidence based practice rules without added more risk of complications, less post-operative pain with early ambulation and shorter hospital stay.

Keywords: laparoscopic sleeve gastrectomy post-operative drain, post-operative complications, leaks, bleeding, abscess

Introduction

The World Health Organization (WHO) has declared obesity as the largest global chronic health problem in adults which is increasingly turning into a more serious problem. Obesity is a gateway to ill health, and it has become one of the leading causes of disability and death, affecting not only adults but also children and adolescents worldwide [1].

Obesity rates have increased 3-fold or more since 1980 in Middle East, [2, 3]. Obesity related medical problems affect very huge number which exceed 115 million individuals according to WHO in developing countries. These disorders according to WHO will be the number one of death cause among needy population by 2030 [4]. Egypt WHO profile show that, schaemic heart disease (20.5%), Stroke (13.3%), Hypertensive heart disease (4.1%), chronic obstructive pulmonary disease (2.8%) [5]

There is no doubt that the surgery without post-operative abdominal drains are more comfortable for the patients. Bariatric surgeons becomes more familiar and experts with laparoscopic sleeve gastrectomy and management for its complication including its early detection. The surgeons changes his surgical practice with progress in the bariatric surgery technique and instruments and diagnostic tools that able them for early detection and diagnosis of complication after bariatric surgery that render them does not use drains rottenly post laparoscopic sleeve gastrectomy, also the tool of non-invasive intervention to manage the complications as CT guided aspiration of abdominal collection or aspiration of abscess and endoscopic stinting for post-operative leaks.

Placement of drains does not facilitate detection of staple line leak, abscess, or bleeding. Furthermore, they don't seem to eliminate the reoperation rates for these complications. In some cases conservative management of leaks can happen, but no one can predict during the operation which patient

could benefit from the placement of a drain. Most of surgeons tend to place a drain in cases of technical difficulties, but we don't believe that there is any value on this. Maybe patients with difficult surgery and intraperitoneal bleeding could benefit from placement of a drain that will remain for more than 4 days in place {6}

In gastric surgery, drain placement is designed for the removal of fluid collections or for the early detection of postoperative bleeding, pancreatic fistulas, anastomotic leakage, and intra-abdominal infections. Incorrect use of an intra-abdominal drain can cause exudation of protein-rich ascitic fluid, which may lead to hypovolemia and hypoproteinemia, or facilitate retrograde bacterial contamination. With recent advances in interventional radiology, image-guided percutaneous drainage and aspiration procedures after the onset of complications now entail a low risk of intestinal injury [7].

Certain surgeons currently believe that routine drainage can increase the incidence of intra-abdominal and wound infections, exacerbate abdominal pain, reduce lung function, and prolong hospitalization, as well as erode the hollow viscera and peripancreatic vessels [8, 9]. Although some surgeons have devoted themselves over recent decades to researching postoperative routine drainage, they have been unable to confirm the advantages of this procedure for patients after gastrectomy, cholecystectomy or other abdominal surgeries using randomized controlled experiments [10, 11].

Certain complications were even revealed after the drains had been removed [12, 13]. Moreover, only certain types of intra-abdominal bleeding can be detected during the early stages with routine drainage, and other types must be detected via clinical symptoms and imaging examinations. The assessment of clinical symptoms and imaging examinations are the most effective ways to detect postoperative complications, regardless of whether routine drainage is utilized [14], The refore, it is not apparent that routine drainage is helpful for the early detection and Prevention of postoperative complications [15].

Patients and Methods

100 patients (80 Female and 20 Male), who underwent LSG at the AL-Azhar university hospitals and other certified hospitals from Sept. 2014 to Sept. 2016 were done, All operations were performed by the same operative team and were completed laparoscopically. Inclusion criteria were a body mass index (BMI) greater than 40 kg/m2 or greater than 35 kg/m2 accompanied with relevant co-morbidities. Exclusion criteria were the inability to undergo general anesthesia and age greater than 60 years. Complete medical and surgical history taken, blood tests, duplex both lower limb, gastric barium study, abdomino-pelvic ultrasound, operative and post operative data are collected, informed consent, the study approved from all relevant committee.

Operative Technique

Low molecular weight heparin 40 IU, SC, 1gm Antibiotic IV, Bilateral Lower Limb Elastic Stocking, a 4-trocar technique is used and the surgeon stands between the patient's legs. After induction of general anesthesia the patient is set in supine anti Trendeleburg position and a Virus needle CO2 is used after entering in the peritoneal cavity. division of the vascular supply of the great curvature of the stomach, continue the dissection up to the left crus of diaphragm, a 38-Fr boogie is inserted in the stomach and the gastrectomy starts about 5 cm proximal to the pylorus. The procedure continues with a longitudinal gastrectomy of the great curvature of the stomach which "sleeves" the stomach. Stapling device is used (60 mm loaded with the ECR60D cartridges -Ethicon Endo-Surgery, Inc). The staple line are reinforced in tow steps. We continuing sutures by absorbable suture along the stable line (then we wrap the suture line with omentum the bleeding points are controlled using surgical sutures that also reduce the rate of staple line leak or bleeding. Leaks test with metheleen blue are routine, N0 post-operative intraperitoneal drains were used. Post-operative nasogastric tube were left in all cases. Post-operative care including early ambulation and gastrografen at 2nd days for detection of leaks, and oral fluid (only water) to be started if no leaks. Then liquid diet before discharge.

Statistical analysis of the data

Data were fed to the computer and analyzed using IBM SPSS software package version 20.0. Qualitative data were described using number and percent. Quantitative data were described using range (minimum and maximum), mean, standard deviation and median.

Results

100 patients (80 female) and (20 male) the age ranges from (18- 60 years) Median 39±21 and BMI Ranges from (35 – 59 kg/m²) Median 47±12 kg/m². (Table: 1).

Table 1: Patients Demographics.

Patients/No	existent	range	percentage
Age (years)	18-60	39±21	-
sex	F 80 M 20	4:1	80%:20%
BMI (kg/m2)	35-59kg/m²	47±12 kg/m²	-

Associated Comorbedities are Diabetics (76 patients 76%), Hypertension (22 patients 22 %), Hyperlipedemia (26 patients 26%), Osteoarthritis (56 patients 56%). Sleep apnea (36 patients 36%), Co-morbodities and the incidence of patients who had prior lower abdominal surgeries as shown in (Table: 2).

Table 2: Associated Comorbiedites and previous Surgery.

(Bariatric procedure)			
Balloon insertion	14 (F 8,M6)	1.33 : 1	6%
VBG	5 (F 3, M2)	1.5 : 1	5%
LAGB	4 (F3, M1)	3 : 1	4%
Comorbedites			
Diabetes	76 (F 60, M 16)	1.3-2	76%
Hypertension	22(F10, M 12)	1.06-2	22%
Hyperlipedemia	26 (F 10.M 16)	1-1.6	26%
Osteoarthritis	50 (F 38, M 12)	1-3.1	50%
Sleep apnea	16 (F 8, M 8)	1-1	16%
Previous abdominal surgery			
C s	30	-	30%
Appendectomy	6 (F3. M 3)	1-1	6%
Cholicystectomy	12(F 7, M 4)	1.75-1	12%
PUH repaire	14 (F 13, M1)	13-1	14%
Overian Cystectomy	2	-	2%

F=Female, M= Male

Intra-operative Data

Operation time range from 30-50 minutes median 40±10 minutes, One case of liver injuries due to lever retractor managed by haemostatic laparoscopic sponge application done before Completion of operation, 3 cases of stable line bleeding managed by suture and Omental wrap. (Table 3).

Table 3: Intra-operative Data:

Patients/no		Ratio	percentage
Time (minutes)	30- 50	40±10 minutes	-
injuries	1 (Male)	-	0.01%
Bleeding stable line	3(F1, M2)	2:1	0.03%
leaks	0	0	0

Postoperative data

Postoperative time interval to first flatus and defecation, whereas the time to first oral intake of fluids and food. The early ambulation after surgery with early intestinal movement followed by starting of oral water seeps and shorter hospital stay. No cases of leaks. One case of intralpertoneal small hematoma at day 9 detected by ultrasound the patient complaining of hiccough and feel upper abdominal upset and nausea, managed by ultrasound guided aspiration once only, pulmonary infection occurs in x-smoker patients managed by proper antibiotics and chest physiotherapy, 3 cases wound infection treated by local debridement and antibiotics according culture and sensitivity. (Table: 4)

Table 4: Postoperative data:

Patients/no	Days post oper.	no	percentage
First water drinking	Day2 no=100	100	100%
First eating	Day 2 no =100	100	100%
First flatus	Day1 no= 70	70	70%
First defecation	Day2 no= 80	80	80%
Postoperative complication			
Leaks	0	0	0%
Wound infection	7	3	3%
Abscess	-	-	-
Hematoma	9	1	1%
Pulmonary infection	13	2	2%
Hospital stay	1-3 days	2 days	-

Postoperative Pain

The overall 24-hour postoperative median pain score from 0-7 with a median of 3,5 which is low and insegnificant. Postoperative low median pain score 6, 12 and 24 hours postoperatiely and therefore received less analgesics. (Table 5)

Table 5: Postoperative Pain.

Pain score	range	Z	Analgesic/no
6 h	0.0 - 7.0	0.3	2
12h	0.0 – 5.0	0.1	1
24h	0.0 - 3.0	0.002	00

Z: Z value for Mann Whitney test.

Discussion

There is no doubt that the surgery without post operative drains are more comfortable for the patients. The total number of bariatric procedures is rising. Management of surgical patients should improve and surgeons should be able to practice based upon sound scientific principles (Evidence Based). Lack of definitive evidence has not helped the resolution of some controversial issues surrounding the use of surgical drainage. The early discharge strategy the patients stay for the first 2 days in hospital and then to get a gastrografin swallow study on 2nd postoperative day to exclude leak before liquid diet is commenced before discharge. Whether this strategy provides many advantages. Cosmetic results are much better. Postoperative pain is reduced, which results in faster mobilization and a lower number of immobilization-associated complications, such as venous thrombosis and pulmonary embolism. There is less postoperative bowel paralysis, allowing a faster postoperative feeding progress.

There are more and more published study of sleeve gastrectomy without leaks (Drake E. B, & Frank L. G.) in study of Laparoscopic Sleeve Gastrectomy, 529 Cases Without a Leak, conclude that. The LSG can be performed in a community practice with a low complication rate. Surgeons performing LSG should strive to minimize the risk of creating strictures at the incisura angularis and stapling near the esophagus at the angle of His [16].

Our operative protocol to Oversewing of the staple line and omintal wrapping are preventative measure may lead to reduction in leak rate, no leaks in our study. The incidence of staple line bleeding can be minimized by following meticulous technique and adequate compression time after closure of the stapler.

Placement of drains does not facilitate detection of staple line leak, abscess, or bleeding. Furthermore, they don't seem to eliminate the reoperation rates for these complications. In some cases conservative management of leaks can happen, but no one can predict during the operation which patient could benefit from the placement of a drain. Most of surgeons tend to place a drain in cases of technical difficulties, but we don't believe that there is any value on this. Maybe patients with difficult surgery and the intraperitoneal bleeding could benefit from placement of a drain that will remain for more than 4 days in place [17].

Stable line leaks typically occur during or after surgery during surgery they are typically noticed and fixed before completing the surgery, Patients diagnosed with a staple line leak after LSG. When patients complained of pain, nausea, or fever, either upper gastrointestinal imaging (UGI) or computed tomography (CT) scan of the chest, abdomen, and/or pelvis with contrast was performed [17] Gastric leaks can be diagnosed either incidentally on a routine upper gastrointestinal series performed postoperatively without any clinical signs or during exploratory laparoscopy/laparotomy performed owing to unexplained tachycardia. In a study by Kolakowski and colleagues, a combination of clinical signs of fever, tachycardia and tachypnea was found to be 58.33% sensitive and 99.75% specific for detection of anastomotic leaks [18].

Bleeding usually presents with a serial drop in serum hemoglobin levels or signs of tachycardia or hypotension. Common sources for extraluminal bleeding include the gastric staple line, spleen, liver or abdominal wall at the sites of tracer entry [19].

Intra-abdominal abscess is another possible complication after LSG. It usually presents with symptoms of abdominal pain, fever/chills or nausea and vomiting. If there are clinical

suspicions, one should obtain a computed tomography scan of the abdomen to rule out the presence of intra-abdominal abscess. In a series of 164 patients undergoing LSG, Lalor and colleagues reported one patient with an abscess (0.7%). Treatment includes percutaneous drainage and antibiotics [20].

Drain placement didn't seem to protect from the formation of an abscess since percentages were similar in all patients, the abscess was confirmed with a CT after the fourth postoperative day, The management of an intraperitoneal abscess requires usually drainage under CT guidance, ultrasound guided or laparoscopically, or through a mini laparotomy [21, 22].

Stricture is another potential complication occurring after LSG. It could present either acutely after surgery due to tissue edema or more commonly in a delayed fashion. Presenting symptoms include food intolerance, dysphagia or nausea and vomiting. Although kinking of the stomach following LSG has been reported [23], the most common site of stenos is at the incisura angularis. An upper gastrointestinal study or endoscopy is usually diagnostic [24].

We insist in taking care for a good monitoring of patients. The clinical monitoring of the patient is the most helpful to detect complication, Bleeding can be identified intraoperatively by direct vision. Postoperatively drains can sometimes be helpful in detecting bleeding. This happens only in cases of intraperitoneal bleeding with non-obstructed drain, but not in all of them the drain usually obstructed in most cases. And especially for their heart rate, confirming a suspicion of bleeding with hemoglobin measurements. This strategy provided us a safe management in all patients, even in these without drains, leaving away any reason of positioning them in order to detect a bleeding. When bleeding was identified, conservative management of stopping anticoagulation and appropriate fluid or blood resuscitation was sufficient in most of cases

(Robinson JO) In study, drainage versus no drainage, 75 patients received a prophylactic drain, whereas 44 patients had no intraperitoneal drains after surgery. Drainage neither reduced the incidence of intra-abdominal fluid collections including abscesses nor the duration of hospital stay. Furthermore, there were a significant number of drain-related complications such as drain tract infections (10.7%) and acute intestinal obstruction (2.7%) [25].

The data demonstrate that in many instances prophylactic drains are useless or may even add to the morbidity or cost of a procedure [24]. Over the last three decades, efforts have been made to investigate the effectiveness of prophylactic drainage of the peritoneal cavity in controlled randomized clinical trials [26-27]. Although there are no evidence-based data justifying the use of drains in various situations, including bariatric surgery, most services routinely use them for the early identification of fistulae and their treatment [28].

The complication discovered in current study diagnosed at the day 9 post-Operative. One case of hematoma that aspirated under ultrasound guided so the drain does not play any rule, we know it usually removed before that time and or usually obstructed after 24 hours**.** Early postoperative upper gastrointestinal contrast (UGI) studies have very low sensitivity to detect a leak early after SG, because most leaks are reported to occur after hospital discharge and > 10 days after surgery [29]

In an experimental study (Agrama HM et al), observe that the tubular drain was found to be obstructed early, 24 to 48 h after its insertion, due to envelopment by the omentum and penetration of omental fringes into the draining orifices. Contamination around the drain has also been observed, causing washing for relief of obstruction to be risky [30].

Our study results concede with other study that prove the advantages of laparoscopic sleeve gastrectomy without drain as safe procedure regard patients comparability with less pain and less need for analgesic, early ambulation and early passage of flatus and starting oral fluid and shorter hospital stay as well as less cost.

CC Chang et.al observes that routine abdominal drainage is not necessary after a successful LGB for morbidly obese patients. Drainage omission may contribute to a faster recovery, shorter hospital stay, and reduced costs without causing additional surgical complications. We stopped performing routine drainage for LGB in August 2008 after experiences with tube dislodgement in the abdomen, We found that patients without abdominal drainage had a significantly shorter time to flatus passage compared to the group with drainage. This may be related to earlier ambulation in patients without drainage and less foreign body reaction. Patients without drainage had an average hospital stay shorter than that of patients with drainage therefore, omitting routine abdominal drainage did not increase morbidity and may contribute to early discharge from the hospital, which also reduces costs [31].

Conclusion

Laparoscopic sleeve gastrectomy can be done safely without placement of post-operative intraperitoneal drains. Provides more patients' satisfaction, its evidence based practice rules without added more risk of complications, less post-operative pain with early ambulation and shorter hospital stay as well as less cost. Follow-up studies are necessary to assess the long-term durability of these results.

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