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LAPAROSCOPIC REINFORCED SLEEVE GASTRECTOMY

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ABSTRACT: *The obesity is the big problem now a day and classify as a disease so early diagnosis can help to treated easily.There are many method to treated the obesity include diet program with physical activity or surgical intervention ,the most popular surgical intervention is longitudinal sleeve gastrectomy (LSG) and the most serious ,potentially life-threatening complications of laparoscopic sleeve gastrectomy (LSG) are staple-line leakage and perioperatative bleeding Oversewing (reinforcement) the LSG staple line vs nonoversewing to reduce perioperative bleeding and postoperative gastric leak was evaluated. From 2013 till 2016 through 224 cases .100 of them underwant longitudinal sleeve gastrectomy by use endo GIA tristiplar cartilage purple in colour coviden (group A) and 124 cases by use the same type of cartilage with reinforcement (oversewing) the stiplar site by using V-LOC 3/0 absorbable ,so the result appear as decrease incidence of leak and bleeding perioperatively .*

KEYWORDS: Bariatricsurgery .Laparoscopic .Sleeve gastrectomy Morbidobesity .Gastricleak .Staple-line reinforcement, v-loc.

INTRODUCTION

Sleeve gastrectomy (SG) is a restrictive procedure initially developed as part of a staged approach for high-risk, superobese patients [1, 2]. Since 2007, SG has been increasingly performed as a stand-alone bariatric procedure with good weight loss and resolution of obesity-related comorbidities [3–17]. Laparoscopy sleeve gastrectomy (LSG), involves the creation of a small gastric reservoir based on the gastric lesser curvature over an orogastric tube, in addition to removal of a large portion of the greater curvature. LSG produces a decrease in ghrelin levels for up to 1 year, which may reduce the desire for food [18, 19]. Notable advantages of LSG include low rates of complications (3–24%) and mortality (0.39 %), the ease of performing the procedure, preservation of the pylorus, maintenance of physiological food passage, and avoidance of foreign material [11–13, 20]. The most commonly reported complications of LSG are bleeding and leaks even the stenosis in some cases . Bleeding can occur from gastric blood vessels during dissection of the greater curve of the stomach. Most bleeding problems associated with LSG occur from the

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staple line after transection of the stomach [9, 21]. This bleeding is most likely a result of the large staples used for the thick tissue in the distal stomach. Large staples are not adequate to seal small vessels [22]. Gastric leak after LSG is a serious complication, and reports of its incidence in numerous studies range from 3 % to 5.7 % of patients [6,9,23–30].Many surgeons have investigated the reinforcement of staple lines as a means of reducing gastric leaks after LSG. These efforts have included staple-line oversewing, covering with omentum or jejunum, applying fibrin glue, and buttressing the staple line with a material that has been preloaded onto the stapler gun [31–38]is added more cost so unaccepted in our country . In this study, we investigated the efficacy of oversewing for about224 case treated through 2013 to 2016. We compared complication rates with a special focus on leak (fistula) and bleeding, in two groups of LSG patients: an initial group of 100 who is estaple lines were not oversewn (group A) ,and 124 who stapler line was oversewing (group B) . A follow-up qualitative analysis profiled characteristics of patients who developed postoperative gastric leak (fistul) and perioperative bleeding.

METHODS

Patient Eligibility and Informed Consent

Patients seen for treatment of morbid obesity underwent a multidisciplinary evaluation and preparatory process for bariatric surgery by the various clinicians of the Institute's Obesity Center. Patients were considered eligible for LSG if they met the indications for bariatric surgery of the International Federation for the Surgery of Obesity (IFSO) and the National Institute of Health (NIH) [39, 40]. Informed consent was obtained from all patients

Study Design

In this retrospective analysis of prospectively collected data,with oversewing of the staple line [using V- loc 3/0 absorpable , Endo GIA™ Ultra Universal Stapler, Covidien, Mansfield, USA). LSG procedures were performed by the same surgeon and surgical team in an operating room dedicated to obesity procedures

Surgical Technique

Antibiotic prophylaxis was administered at the time of induction and in two doses postoperatively. All patients received venous stasis prophylaxis by external pneumatic compression at the time of surgery and low-molecular anticoagulant (clexan) half hour before surgery and every 12 hour post operatively for the duration of hospitalization and 10 days after discharge to home. Under general anesthesia, the patient was placed in reverse Trendelenburg lithotomic position, arms and legs abducted, with the surgeon positioned between the patient's legs, the first assistant on the patient's right, and the second assistant on the patient's left. Closed CO2 pneumoperitoneum was induced by Veress needle insertion in palmers point. Four trocars were positioned in the usual manner figure1.

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figure 1 show position of 4 port site.

We proceeded with a standard SG starting at the distal greater curvature and using the Ligasure as a vessel-sealing device. Serosal attachments of the posteriorgastric wall to the pancreatic capsule were kept in order to prevent subsequent gastric rotation.

The stomach was calibrated with the help of a 40-Fr orogastric tube. Figure2

Figure 2 (40 F orogastric tube)

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All of the resection was accomplished by firing purple endoscopic linear stapler cartridges (Endo GIA™ 60 -use loading unit; Covidien). Between sixth and eight cartridges were used in each operation depending on the length of the resected stomach figure 3.

Figure 3 show tristiplar purple cartilage

In Group B, after electrocautery was used to control small venous oozing along the nonbuttressed transection line, the line of staples was reinforced with a manual, running, absorbable, V-LOC 3–0 seroserosal suture figure 4

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Figure 4(line of staples was reinforced with a manual ,running , absorbable, V-LOC 3–0)

In Group A,was applied to the Endo GIA transected stomach was not reinforced in the same fashion as with Group B. No nasogastric tube was left in place. In all instances, a methylene blue dye test for determination of staple-line integrity was performed. A 14-Fr close system drain was placed under and along the remaining stomach. The resected stomach was removed through the 15-mm trocar, usually without elongating the incision. No fascial defects were closed.

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Data Collection

Baseline patient characteristics, including age, gender, height, weight, BMI, and comorbid conditions, were recorded in the program's bariatric database. Operative time, blood loss, and complications were recorded. all patients were followed 10 days after hospital discharge and regular follow-up appointments every3weeksthereafter.the postoperative radiographic studies were routinely performed before remove the drain , the endoscopic studies were conducted on patients who returned for a follow-up appointment with any gastrointestinal symptoms, such as pain, vomiting, or inadequate weight loss.

RESULTS

Patient Characteristics, Operative Time, and Hospital Stay

As shown inTable1, generally ,baseline patient characteristics were not significantly different . For Group A, the mean age was 35.2 years, and 33.8 years for Group B. Mean BMI was 42.5kg/m2 for Group A and42.0kg/m2 for Group B. The two groups did not differ with respect to operative characteristics

Table 1 Preoperative patient characteristics			
Variable	Group A (non oversewing)	Group B (oversewing)	p value
n=100	n=124		
Mean±SD (range)			
Age (years)	35.2±10.5	33.8+_10.3	NS (P=0.29)
(18.5-68.6)	(15.5-64.5)		
BMI (kg/m2)	42.5±7.5	42+_5.8	NS (p=0.59
(27.0–76.0)	(30.0-58.0)		

Mean operating timewas120min, mean blood losswas75ml,and mean hospital length of stay was 3-4 days

Weight Loss At3- and 6-month follow-up ,both groups had lost significant weight relative to baseline.At3months,BMI in GroupA had decreasedby5.9±10.3kg/m2 (95% CI,3.9,7.9),from43.2± 8.1 to 37.3±12.8 ($p<0.001$); Group B BMI decreased 7.3± 2.3 (6.6, 8.0), from 42.5±6.1 to 35.2±5.4 ($p<0.001$).

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At 6months,GroupABMI decreased10.8±5.3(9.6,11.9),from 43.4±8.7 to (32.7±7.3)p<0.001; Group B BMI decreased 11.3±3.2 (9.9, 2.7), from 42.8±5.9 to 31.5±4.7)p<0.001

Mortality, Complications, and Leak Rate

No mortality occurred

In addition, in Group A, one (0.6 %) patient experienced severe bleeding, and numerous others developed minor bleeding from their staple lines managed conservatively , reinforced staple lines had essentially no visible bleeding; however, no significant difference in mean blood loss between groups was observed (NS, p=0.39). Finally, four (2.5 %) Group A patients and one (1.2 %) Group B patient required reoperation (NS, p=0.66.

Table 2,shows characteristics of the patients who developed fistulae. Data on fistulae were analyzed according to patient risk factors, time of occurrence after surgery, manifesting signs and symptoms, location, and medical and surgical management. Both BMI and history of previous surgery appeared to correlate with fistula development: Most fistulae occurred in patients with a BMI>40(6/9;67.0%),and five of the nine (56.0 %) patients with this complication had undergone previous abdominal surgery. The nine fistulae developed between 2 and 4 weeks after surgery. Eight of nine patients (89.0 %) with fistula had fever and tachycardia as the first manifesting signs. Left shoulder pain was reported by six of nine patients(67.0%) with fistula , Patients with a suspected postoperative leak underwent a gastrographen swallow test to confirm leak/fistula, in most cases double-contrast abdominal computed tomography scan with intravenous and water-soluble oral contrast was also performed.

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Table 2 Patients with acute staple-line leak (fistula)

Age (years	sex	p.s.	BMI	TOAS	symptoms	I T	F T	TTD
group A				weeks				
40	M	L.chole.	41	2	PT+LSP	AB+FJ+D	non	8 months
33	M	non	37	2	PT+LSP	AB+FJ+D	non	6months
27	F	non	55	4	PT	AB+FJ+D	RNY	2 months
38	F	abdo.plasty	48	2	PT	AB+FJ+D	non	6 months
44	F	non	39	4	PT+LSP	AB+FJ+D	non	4 months
31	F	non	41	4	PT+LSP	AB+FJ+D	RNY	3 months
45	M	umb.hernia	51	3	PT+LSP	AB+FJ+D	non	8 months
25	F	non	49	2	PT	AB+FJ+D	non	6 months
group B								
37	F	non	38	4	PT	AB+FJ+D	non	4 months

M male, F female, BMI body mass index, PS previous surgery, TOAS time of occurrance after surgery(leak), IT initial treatment ,FT final treatment ,TTD total treatment duration , PT pyrexia and tachycardia, LSP left shoulder pain, AB antibiotic, D drainage, RNY Roux-en-Y gastric bypass, FJ feeding jejunostomy.

DISCUSSION

Complications of LSG Bleeding and staple-line leak, are the most common complications of LSG [6, 9, 23–30]. Bleeding usually occurs along the staple line,or the greater omentum ,once freed from the greater curvature of the stomach [20]. Numerous factors have been implicated in the development of staple-line leaks. Most leaks are due to local factors at the stapleline, such as inadequate blood supply and oxygenation, which can impede healing. Gastric-wall heat ischemia, due to heat generated by the cautery used during dissection of the greater curvature, also may play a role in leaks subsequent to LSG. TheLSG procedure produces high intragastric pressure, which can lengthen the amount of time needed for a leak to close [41]. Innate characteristics of the stomach also play a role in post-LSG leaks. Although the blood supply to the stomach is robust, the gastroesophageal junction tends to be an area of decreased vascularity and, thus, is more prone to leaks.Inaddition,the stomach is typically thinner at the angle of His, and some authors suggest that the large staple height used by many surgeons may not adequately seal this area[22]. Leak after LSG usually appears distal to the gastroesophageal junction ,with incidence between 3%

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and 5.7%[6,9, 23–30]. Leaks in this area may be related to high intraluminal pressure caused by the vertical tubulization of the stomach [41]. This pressure is amplified by the low compliance of the sleeve, which is ten times less than the compliance of the complete stomach or the resected fundus[42]. Although there was no significant difference in operative blood loss between the current study groups,(A and B). the bleeding was usually venous ooze but occasionally involved small pumping arterioles. Management of this slight bleeding probably had a marginal effect on case time, but it disrupted operative momentum. The surgical team readily gained proficiency in the technique of reinforcement (i.e., over sewing stapler site). In some instances, the stapler was found to jam secondary to excessive thickness of the stomach wall, or a mechanical problem with the stapler itself. Specific patient risk factors may increase susceptibility to staple-line leaks, Of the nine patients who developed fistulae in our study, most had a BMI>40 and had undergone an earlier abdominal surgery. In our experience, increased BMI and a history of previous abdominal procedure are potential risk factors for leak occurrence after LSG. At our institution, we began the practice of suturing to improve the durability of staple lines and start from about 6 cm from pylorus to keep the physciological contraction of stomach and use big size orogastric tube (bougi) 40F

Although staple-line buttressing is used in some bariatric operations, the practice has been explored with variable clinical efficacy and no conclusive data in LSG [30–35, 37, 38]. In animal studies, the practice is known to increase burst pressure and decrease hemorrhage [43, 44], and it has proved beneficial in other types of operations performed in humans [45–50] but it expensive in our country added for about 1300$ when compare with price of V-LOC which it about 35$. the ovesewing start from about 2-3mm from the stiplar line anteriorly and 2-3 mm posteriorly for inverted or oversewing all the stomach stiplar line under guide the stomach tube ,the test by methylene blue or air bubble must do before oversewing the stiplar line . Death may result if leak is not identified and treated rapidly; complications associated with staple-line failure can necessitate the expenditure of hundreds of thousands of dollars. Our surgical team found that over sewing (inverted)the stomach (1) was easy to do; (2) resulted in staple lines with no visible bleeding that were oftencompletelydry; (3)reshape the stomach to look like the banana ; and (4) added only a few minutes to procedure length about 10-15 minutes.

LIMITATIONS

There are two important limitations of this study. First, this was need expert surgeon for suture technique intracorporeal .Second ,in redo operation after gastric plication or sleeve gastrectomy(not proper) its better to avoid over sewing because friability of stomach tissue and to avoid stricture or narrowing of lumen.

CONCLUSIONS

Increasingly, primary health-care providers refer obese patients for bariatric surgery; the total number of bariatric procedures is rising. Any technique that reduces the stapleline failure rate will improve patient quality of life and reduce health-care costs. In our study, both groups were comparable in terms of baseline characteristics and early weight-loss outcomes. Also, although the difference in complication rates between LSG procedures with oversewing and those without oversewing was statistically significant.

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So inverted or reinforcement the stiple line under guide of wide caliper tube about 40F and remove all the fundus of stomach which it most common area of leak,and start from about 6cm from pylorus to dissection his will reduce the risk of leak and bleeding post operatively.

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