



Original Article:

Laparoscopic Sleeve Gastrectomy – An Experience.

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Citation

Salati SA, Arrowaili AI. Laparoscopic Sleeve Gastrectomy – An Experience. *Online J Health Allied Scs.* 2017;16(1):7. Available at URL: <http://www.ojhas.org/issue61/2017-1-7.html>

Submitted: Feb 28, 2017; Accepted: April 4, 2017; Published: May 15, 2017

Abstract: Obesity has emerged as a serious health care problem globally in recent decades. Various surgical options have been tried in recent years and Laparoscopic Sleeve gastrectomy (LSG) is one such options. This article presents a retrospective analysis of 47 patients who underwent this operation over a period of 18 months from January 2013 and June 2015. All the patients achieved a significant weight loss with no adverse effects, thereby showing this modality to be safe and effective single surgical intervention for body weight reduction in morbidly obese.

Key Words: Morbid Obesity, Laparoscopic sleeve gastrectomy (LSG), Body Mass Index (BMI)

Introduction:

Obesity is globally being recognized as a serious lifestyle-related non-communicable disease that is increasing in prevalence rapidly since a last few decades and is taking a form of an epidemic.(1,2) In Saudi Arabia also like other developing countries, the high and rising prevalence of overweight and obesity (39.9% to 45.6% in males and from 30.4% to 38.7% in females) has emerged as a major public-health concern.(3) There is strong evidence in recent literature that bariatric surgical operations are the only effective means for achieving sustained and long-term weight reduction in the patients of morbid obesity.(4) This weight reduction has also been proven to be associated with the alleviation or improvement of obesity-related comorbid conditions, that increase the risk of mortality associated with obesity.(5) Currently three main procedures are in vogue that includes Laparoscopic Adjustable Gastric Banding (LAGB), Laparoscopic Roux-en-Y gastric bypass (LRYGBP), and Laparoscopic Sleeve gastrectomy (LSG). LSG was introduced in 1988 as the first step in a Bilio-pancreatic diversion (BPD) with a duodenal switch but was, since then, proven to be effective and safe as a stand-alone bariatric surgical procedure. LSG has rapidly become popular due to the simple and straightforward surgical technique that does not involve any intestinal bypass or creation of intestinal anastomosis. (4,6-8) The current study was undertaken to study the outcomes of the LSG operation conducted by the teams of the authors.

Materials and Methods

Medical charts of all patients who underwent a LSG at the authors' institution between January 2013 and June 2015 were reviewed retrospectively. Data was also retrieved from the verified departmental logbooks of the surgeons. Only patients with follow-up of at least 18 months were included in the study. Patients with incomplete records or inconsistent follow up were excluded. The data retrieved included demographics, preoperative investigations, weight, BMI, imaging studies, operation techniques, postoperative complications, days of hospital stay, weight, BMI and investigations at follow up. The data was analysed with MS-Excel 2010 and Statistic software SPSS -11.

Results

A total of 47 cases underwent LSG from January 2013 and June 2015 and satisfied the inclusion criteria of the study. The patients included 32 females and 15 males with weight ranging from 98 kg to 148 kg (mean 118 kg) and BMI ranging from 40.9 to 49.2 (mean 46.5).

Preoperative phase: All the patients had used some dietary regimen to lose weight but had failed to lose or to maintain weight loss. Five (10.6%) patients had tried and failed in other weight reducing procedures and that included Intra-gastric balloon implantation procedure in 4 (8.5%) and Laparoscopic gastric banding in 1 (2.1%). Nineteen (40.4%) of patients had one or more co-morbidities (Figure 1) that included Dermatological (Striae / Dermatitis / Intertrigo) in 13 (27.7%), Psychiatric (Anxiety disorder) in 5 (10.6%), Gastrointestinal (Non-alcoholic fatty liver, *H. Pylori* gastritis, asymptomatic cholelithiasis) in 30 (63.8%), Endocrinological / Metabolic (Vitamin D deficiency, Diabetes) in 18 (38.3%) and Musculoskeletal (Osteoarthritis of knee joints) in 3 (6.4%). Besides 5 in 32 females had menstrual disturbances (15.7%).

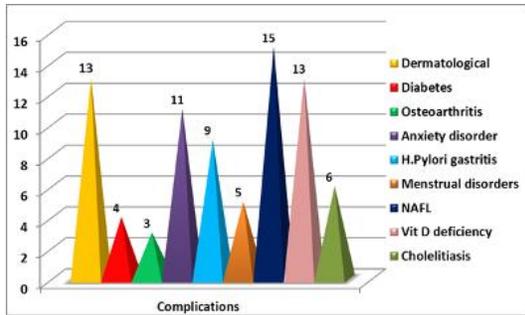


Figure 1: Co-morbidities in the patients

Surgical technique: All the surgical operations were performed laparoscopically. Four skin incisions were placed at two sites of the abdomen, including two skin incisions along the natural fold of umbilicus for 10-mm port for laparoscopic camera and a 12-mm incision for the left working port, a 12-mm incision for right working port, one skin incision at left lateral abdominal wall for a 5-mm port as right working port. One 2 mm stab incision was made in subxiphoid area for insertion of Nathanson liver retractor. The first port was inserted under vision by 12 mm Versaport Bladeless Optical Trocar [Covidien, Norwalk, CT, USA]. Dissection of the greater omentum and short gastric arteries was done using 5-mm blunt tip laparoscopic LigaSure vessel sealing system (LVSS) [Covidien, Norwalk, CT, USA], starting at about 4 cm from pylorus (2nd branch of right gastro-epiploic artery) to the angle of His sparing the sling fibers near cardio-esophageal junction and gastro-epiploic vessels. Full mobilization of the gastric fundus was done and the posterior gastric wall was freed from pancreatic adhesions, if present. Once the stomach was completely mobilized, a 40 F oro-gastric tube size was placed for calibration along the lesser curvature of stomach directed toward the pylorus before the actual process of gastric resection. Vertical transection of the stomach was accomplished with five to six firings of a 60-mm linear stapler (Endo GIA, Covidien, Norwalk, CT, USA). The firing stapler height was determined by thickness of the gastric tissue, using a black (4.4 mm) stapler near the antrum and a blue (3.5 mm) stapler for the rest of the gastric resection. No invagination of suture line was done in any of the cases though titanium staples and suturing with a 3-0 Vicryl were used if staple line hemorrhage was encountered. Methylene blue intraoperative leak test was employed to rule out any suture line leakage. The resected stomach was extracted through the 12mm lateral working port site after removal of port and dilatation. The fascial defect was closed with a 2-0 Prolene suture and skin was closed with skin staples.

The mean operating time was 122 minutes (Range: 87 to 168 minutes); there were no intra-operative complications except in 1 (2.1%) in whom surgery was abandoned due to failure in achieving clear and safe operative field because of grossly enlarged left lobe of fatty liver, not retractable by Nathanson liver retractor.

Postoperative phase:

Upper gastrointestinal (GI) imaging was performed in all the patients on the first postoperative day via X-ray, to search for anastomotic leak and to document patency of GI tract using Gastrografin.

The hospital stay ranged from 3 days to 8 days (mean 3.3 days). In 1 (2.1%) patient, there was self-limiting post-operative bleeding and prolonged drain discharge. Low molecular weight Heparin was administered to all the patients during hospital stay. Patients were discharged from the hospital after they were able to start oral diet. All the patients before discharge had been counselled by board-certified dietician and diet plan was explained and hand over in print.

The histopathology of retrieved stomach revealed acute /chronic gastritis in 7 (14.9%) and hyperplastic polyp in 1 (2.1%). The patients included in the study, had been followed up on regular basis and all the patients (100%) lost significant weight. The weight loss was progressive and significant in all the patients with mean weight loss being: 11.7kg at one month, 19.8 kg at 3 months, 31.1kg at 6 months, 40.3kg at 12 month and 52.1 at 18 month as shown in Fig 2. BMI (kg/m²) showed a gradual and steady decrease from preoperative 46.5 to 42.2 at 1 month, 39.3 at 3 months, 35.4 at 6 months, 33 at 12 months and 28.7 at 18 months as depicted in Fig 3.



Figure 2: Reduction in weight after surgical intervention

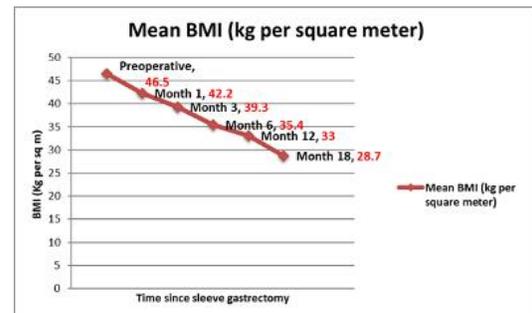


Figure 3: Reduction in BMI after surgical intervention

The impact on comorbidities was positive in anxiety disorders, diabetes, and dermatitis as documented by decrease in requirement in drugs. The impact on Vitamin D deficiency could not be studied as the patients had been administered supplements of Vitamin D. None of the asymptomatic cholelithiasis turned symptomatic and 7 more (14.9 %) patients showed asymptomatic cholelithiasis by 12 months of follow up. The adverse outcome reported in 29 (61.7%) was loosening /redundancy of skin for which the patient had been attached to cosmetic surgical unit. Only 1 (2.1%) of the patients was reported to have any significant feeding problems wherein she required admissions twice in the emergency department in the first postoperative month for correction of dehydration/ hypovolemia, resulting from inadequate feeding and vomiting.

Discussion

LSG has rapidly become popular in recent years due to the simple and straightforward surgical technique that does not involve any intestinal bypass or creation of intestinal anastomosis. The role of this and other bariatric surgical operations is likely to gain more importance as the incidence and prevalence of morbid obesity is on a rise globally.

The preoperative analysis in our series showed a wide range of co-morbidities in 19 out of 47 (40.4%) patients besides menstrual disturbances in 5 out of 32 (15.7%) of females. These figures corroborate with that of the study (9) published in 2015 by one of the authors on the profile of co-morbidities in the obese when, out of the total of 172 cases of obesity, 96

(56%) including 72 females and 24 males had one or more co-morbidities.

Multiple other studies (10-11) and meta-analysis from peer reviewed literature have also proven the association of obesity are associated with the incidence of multiple co-morbidities and stressed that the maintenance of a healthy weight could be important step in the prevention of the large disease burden in the future.

The surgical technique in this study can be termed as the standard as has been explained in detail and published by other experienced workers.(12) The histopathological analysis of retrieved stomach specimens in our series revealed acute /chronic gastritis in 7 (14.9%) and hyperplastic polyp in 1 (2.1%). These results corroborate with the results of bigger series published in literature. Clapp B (13) found histopathological findings in 49.7% of the resected specimens. The main histopathologic findings included acute and chronic gastritis, chronic gastritis, follicular lymphoid hyperplasia. Onzi TR et al (14) found the pattern of gastric histology showed chronic gastritis with inflammatory activity associated with H pylori in 33.3% of the patients, along with foveolar hyperplasia at 58.3%. The chronic gastritis with discrete inflammatory activity was reduced by 16.7 %, and the foveolar hyperplasia was reduced by 33.3% after significant weight reduction during follow up period.

The patients in our study showed statistically significant (P <0.05) weight loss. The mean weight was 52.1 kg and mean BMI reduced from 46.5 to 28.7 at 18 months. These trends corroborate with the large number of series that have been published in literature over last few years (7-8, 15-16). We did not encounter any anastomotic leaks which is otherwise a dreaded complication and reported in 1.06% cases.(17) Armstrong J and O Malley SP (18) did not encounter any leak in 185 patients treated with LSG. The operating time in our series was 102 minutes that is comparable with the early series of workers.(18)

An important encouraging outcome of LSG that is being highlighted in literature is the significant improvement in comorbidities as the patient loses weight. In our series, there were only 4 patients of Insulin dependent diabetes who had reported the decrease in drug requirement. However as has been shown in many other studies, the incidence of cholelithiasis increased during the follow up period and 7 (14.9%) patients developed USG proven but asymptomatic cholelithiasis. Concomitant cholecystectomy was not undertaken for any of the 6 (12.7%) cases who had USG proven but asymptomatic cholelithiasis before the surgery. Cholecystectomy for asymptomatic cholelithiasis undergoing LSG is still debatable. Raziel A et al found concomitant cholecystectomy to be unnecessary and found it to increase the operating time of LSG by about 35 minutes. Li VK et al (20) also recommend that routine prophylactic cholecystectomy should not be during laparoscopic SG. Sjoka E et al (21) however recommend concomitant cholecystectomy in their series published in 2014, as they found that a significant proportion of bariatric patients (5.8%) compared to the general population became symptomatic and developed complications in the absence or not of preoperative gallstones after LSG and because of the real technical difficulties during subsequent cholecystectomy.

To conclude, it may be stated that laparoscopic sleeve gastrectomy is a promising surgical option for the long term management of morbid obesity and its associated comorbidities.

Conflict of Interest: The authors have no conflict of interests or financial ties to disclose.

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