



Weight (< 29.9 kgs/m ²)	Obese Class I (30 - 34.9 kgs/m ²)				Obese Class II (35 - 39.9 kgs/m ²)				Obese Class III (> 40 kgs/m ²)				kgs
	5' 3"	5' 4"	5' 5"	5' 6"	5' 7"	5' 8"	5' 9"	5' 10"	5' 11"	6' 0"	6' 1"	6' 2"	
17.8	17.2	16.7	16.2	15.7	15.2	14.8	14.4	14.0	13.6	13.2	12.9	12.5	45.5 kgs
19.2	18.6	18.1	17.5	17.0	16.5	16.0	15.5	15.1	14.7	14.3	13.9	13.5	47.7 kgs
20.2	19.5	18.9	18.3	17.8	17.3	16.8	16.3	15.8	15.4	14.9	14.5	14.2	50 kgs
21.1	20.4	19.8	19.2	18.6	18.0	17.5	17.0	16.5	16.1	15.6	15.2	14.8	52.3 kgs
22.0	21.3	20.6	20.0	19.4	18.8	18.3	17.8	17.3	16.8	16.3	15.9	15.4	54.5 kgs
22.9	22.2	21.5	20.8	20.2	19.6	19.0	18.4	18.0	17.5	17.0	16.5	16.1	56.8 kgs
23.7	23.0	22.4	21.7	21.0	20.4	19.8	19.2	18.7	18.2	17.7	17.2	16.7	59.1 kgs
24.6	23.8	23.1	22.4	21.7	21.0	20.4	19.8	19.2	18.7	18.2	17.7	17.2	61.4 kgs
25.5	24.7	24.0	23.2	22.5	21.8	21.2	20.6	20.0	19.4	18.9	18.3	17.8	63.6 kgs
26.5	25.7	24.9	24.1	23.3	22.6	22.0	21.3	20.7	20.1	19.6	19.0	18.5	65.9 kgs
27.4	26.6	25.7	24.9	24.2	23.5	22.8	22.1	21.5	20.8	20.3	19.7	19.2	68.2 kgs
28.4	27.5	26.6	25.8	25.0	24.3	23.5	22.9	22.2	21.6	21.0	20.4	19.8	70.5 kgs
29.3	28.4	27.5	26.7	25.8	25.1	24.3	23.6	22.9	22.3	21.7	21.1	20.5	72.7 kgs
30.3	29.3	28.4	27.5	26.7	25.9	25.1	24.4	23.7	23.0	22.4	21.7	21.2	75 kgs
31.3	30.3	29.3	28.4	27.5	26.7	25.9	25.1	24.4	23.7	23.1	22.4	21.8	77.3 kgs
32.3	31.2	30.2	29.3	28.4	27.5	26.7	25.9	25.1	24.4	23.7	23.1	22.4	79.5 kgs
33.3	32.2	31.2	30.2	29.2	28.3	27.5	26.7	25.9	25.2	24.4	23.8	23.1	81.8 kgs
34.2	33.1	32.1	31.1	30.1	29.2	28.3	27.5	26.7	25.9	25.2	24.5	23.8	84.1 kgs
35.2	34.0	33.0	32.0	31.0	30.0	29.1	28.3	27.4	26.6	25.9	25.2	24.5	86.4 kgs
36.2	35.0	34.0	32.9	31.8	30.8	29.9	29.1	28.2	27.4	26.6	25.9	25.1	88.6 kgs
37.2	35.9	34.9	33.8	32.7	31.7	30.7	29.9	28.9	28.1	27.3	26.6	25.8	90.9 kgs
38.2	36.8	35.7	34.6	33.5	32.5	31.5	30.6	29.7	28.9	28.0	27.3	26.5	93.2 kgs
39.1	37.7	36.7	35.5	34.4	33.4	32.3	31.4	30.5	29.6	28.8	28.0	27.2	95.5 kgs
40.1	38.6	37.5	36.4	35.3	34.3	33.2	32.2	31.2	30.3	29.5	28.7	27.9	97.7 kgs
41.1	39.5	38.4	37.3	36.2	35.1	34.0	33.0	32.0	31.1	30.2	29.4	28.5	100 kgs
42.1	40.4	39.4	38.2	37.0	35.9	34.8	33.7	32.8	31.8	30.9	30.0	29.2	102.3 kgs
43.1	41.3	40.2	39.1	37.9	36.8	35.7	34.6	33.5	32.5	31.5	30.6	29.7	104.5 kgs
44.1	42.2	41.1	40.0	38.8	37.7	36.6	35.5	34.4	33.4	32.4	31.4	30.4	106.8 kgs
45.1	43.1	42.0	40.9	39.7	38.6	37.5	36.4	35.3	34.3	33.3	32.3	31.3	109.1 kgs
46.1	44.0	42.9	41.8	40.6	39.5	38.4	37.3	36.2	35.2	34.2	33.2	32.2	111.4 kgs
47.1	44.9	43.8	42.7	41.5	40.4	39.3	38.2	37.1	36.1	35.1	34.1	33.1	113.6 kgs
48.1	45.8	44.7	43.6	42.4	41.3	40.2	39.1	38.0	37.0	36.0	35.0	34.0	115.9 kgs
49.1	46.7	45.6	44.5	43.3	42.2	41.1	40.0	38.9	37.8	36.8	35.8	34.8	118.2 kgs
50.1	47.6	46.5	45.4	44.2	43.1	42.0	40.9	39.8	38.7	37.7	36.7	35.7	120.5 kgs
51.1	48.5	47.4	46.3	45.1	44.0	42.9	41.8	40.7	39.6	38.6	37.6	36.6	122.7 kgs
52.1	49.4	48.3	47.2	46.0	44.9	43.8	42.7	41.6	40.5	39.5	38.5	37.5	125 kgs
53.1	50.3	49.2	48.1	46.9	45.8	44.7	43.6	42.5	41.4	40.4	39.4	38.4	127.3 kgs
54.1	51.2	50.1	49.0	47.8	46.7	45.6	44.5	43.4	42.3	41.3	40.3	39.3	129.5 kgs
55.1	52.1	51.0	49.9	48.7	47.6	46.5	45.4	44.3	43.2	42.2	41.2	40.2	131.8 kgs
56.1	53.0	51.9	50.8	49.6	48.5	47.4	46.3	45.2	44.1	43.1	42.1	41.1	134.1 kgs
57.1	53.9	52.8	51.7	50.5	49.4	48.3	47.2	46.1	45.0	44.0	43.0	42.0	136.4 kgs
58.1	54.8	53.7	52.6	51.4	50.3	49.2	48.1	47.0	45.9	44.8	43.8	42.8	138.6 kgs
59.1	55.7	54.6	53.5	52.3	51.2	50.1	49.0	47.9	46.8	45.7	44.7	43.7	140.9 kgs
60.1	56.6	55.5	54.4	53.2	52.1	51.0	49.9	48.8	47.7	46.6	45.6	44.6	143.2 kgs
61.1	57.5	56.4	55.3	54.1	53.0	51.9	50.8	49.7	48.6	47.5	46.5	45.5	145.5 kgs
62.1	58.4	57.3	56.2	55.0	53.9	52.8	51.7	50.6	49.5	48.4	47.4	46.4	147.7 kgs
63.1	59.3	58.2	57.1	55.9	54.8	53.7	52.6	51.5	50.4	49.3	48.3	47.3	150 kgs
64.1	60.2	59.1	58.0	56.8	55.7	54.6	53.5	52.4	51.3	50.3	49.2	48.2	152.3 kgs
65.1	61.1	60.0	58.9	57.7	56.6	55.5	54.4	53.3	52.2	51.2	50.1	49.1	154.5 kgs
66.1	62.0	60.9	59.8	58.6	57.5	56.4	55.3	54.2	53.1	52.1	51.0	50.0	156.8 kgs
67.1	62.9	61.8	60.7	59.5	58.4	57.3	56.2	55.1	54.0	53.0	51.9	50.9	159.1 kgs
68.1	63.8	62.7	61.6	60.4	59.3	58.2	57.1	56.0	54.9	53.8	52.7	51.7	161.4 kgs
69.1	64.7	63.6	62.5	61.3	60.2	59.1	58.0	56.9	55.8	54.7	53.6	52.6	
70.1	65.6	64.5	63.4	62.2	61.1	60.0	58.9	57.8	56.7	55.6	54.5	53.5	
71.1	66.5	65.4	64.3	63.1	62.0	60.9	59.8	58.7	57.6	56.5	55.4	54.4	
72.1	67.4	66.3	65.2	64.0	62.9	61.8	60.7	59.6	58.5	57.4	56.3	55.3	
73.1	68.3	67.2	66.1	64.9	63.8	62.7	61.6	60.5	59.4	58.3	57.2	56.2	
74.1	69.2	68.1	67.0	65.8	64.7	63.6	62.5	61.4	60.3	59.2	58.1	57.1	
75.1	70.1	69.0	67.9	66.7	65.6	64.5	63.4	62.3	61.2	60.1	59.0	58.0	
76.1	71.0	69.9	68.8	67.6	66.5	65.4	64.3	63.2	62.1	61.0	59.9	58.9	
77.1	71.9	70.8	69.7	68.5	67.4	66.3	65.2	64.1	63.0	61.9	60.8	59.8	
78.1	72.8	71.7	70.6	69.4	68.3	67.2	66.1	65.0	63.9	62.8	61.7	60.7	
79.1	73.7	72.6	71.5	70.3	69.2	68.1	67.0	65.9	64.8	63.7	62.6	61.6	
80.1	74.6	73.5	72.4	71.2	70.1	69.0	67.9	66.8	65.7	64.6	63.5	62.5	
81.1	75.5	74.4	73.3	72.1	71.0	69.9	68.8	67.7	66.6	65.5	64.4	63.4	
82.1	76.4	75.3	74.2	73.0	71.9	70.8	69.7	68.6	67.5	66.4	65.3	64.3	
83.1	77.3	76.2	75.1	73.9	72.8	71.7	70.6	69.5	68.4	67.3	66.2	65.2	
84.1	78.2	77.1	76.0	74.8	73.7	72.6	71.5	70.4	69.3	68.2	67.1	66.1	
85.1	79.1	78.0	76.9	75.7	74.6	73.5	72.4	71.3	70.2	69.1	68.0	67.0	
86.1	80.0	78.9	77.8	76.6	75.5	74.4	73.3	72.2	71.1	70.0	68.9	67.9	
87.1	80.9	79.8	78.7	77.5	76.4	75.3	74.2	73.1	72.0	70.9	69.8	68.8	
88.1	81.8	80.7	79.6	78.4	77.3	76.2	75.1	74.0	72.9	71.8	70.7	69.7	
89.1	82.7	81.6	80.5	79.3	78.2	77.1	76.0	74.9	73.8	72.7	71.6	70.6	
90.1	83.6	82.5	81.4	80.2	79.1	78.0	76.9	75.8	74.7	73.6	72.5	71.5	
91.1	84.5	83.4	82.3	81.1	80.0	78.9	77.8	76.7	75.6	74.5	73.4	72.4	
92.1	85.4	84.3	83.2	82.0	80.9	79.8	78.7	77.6	76.5	75.4	74.3	73.3	
93.1	86.3	85.2	84.1	82.9	81.8	80.7	79.6	78.5	77.4	76.3	75.2	74.2	
94.1	87.2	86.1	85.0	83.8	82.7	81.6	80.5	79.4	78.3	77.2	76.1	75.1	
95.1	88.1.1</												

Initial experience with laparoscopic sleeve gastrectomy in Dubai hospital, United Arab Emirates

Dildar Hussain, Sameera Naureen, Farah Ibrahim, Syed Mohammad Javed, Zaid Abdel Aziz, Bruno Dillemans¹

Department of Surgery, Dubai Hospital, Dubai, United Arab Emirates, ¹Department of Surgery, AzSint-Jan Hospital, Brugge, Belgium

ABSTRACT

Aims: To determine the outcome of patients in terms of reduction of body mass index (BMI), gastric leak, and bleeding after laparoscopic sleeve gastrectomy. **Setting and Design:** This was a descriptive study, and the data was collected retrospectively in Dubai Hospital, Dubai, United Arab Emirates. **Materials and Methods:** All patients who underwent laparoscopic sleeve gastrectomy from April 2012 to July 2013, were included in the study. Multiple parameters were studied, including demographic features, BMI, and comorbid conditions of these patients. The duration of surgery, and reduction of BMI at 3, 6, and 12 month's duration after the surgery were calculated. Postoperative complications, including gastric leak and bleeding were also analyzed. The data was expressed as frequency, percentages, and mean \pm standard deviation. **Results:** A total of 100 patients with mean age of 34 ± 8 years were included in the study. There were 21 (21%) male and 79 (79%) female patients. The mean BMI was 46 ± 6 kg/m². Sixteen (16%) patients had diabetes mellitus, 19 (19%) had hypertension, nine (9%) had joint pain, six (6%) had back pain, and three (3%) patients had sleep apnea as comorbid conditions. Thirty-two (32%) patients had high blood cholesterol level, six (6%) patients had asthma, and seven (7%) patients had gall stones. Five (5%) patients had gastric band removal and two (2%) patients had history of laparoscopic cholecystectomy in the past. All patients underwent laparoscopic sleeve gastrectomy. The mean hospital stay was 3 ± 1 days, and mean duration of surgery was 80 ± 23 min. Five (5%) patients had laparoscopic cholecystectomy, and two (2%) patients had umbilical hernia repair at the same time. The mean BMI after 3 months was 41 ± 6 kg/m², after 6 months was 37 ± 5 kg/m², and after 12 months was 32 ± 5 kg/m². Complete resolution of diabetes was observed in 11 (68.8%) patients and improved in six (31.2%) patients, resolution of hypertension in 11 (57.8%) patients and improvement in eight (42.2%) patients, and joint pain resolved in six (66.6%) patients and improved in three (33.3%) patients. Sleep apnea resolved in all three patients. Blood cholesterol was normal in 18 (56.3%) patients and improved in 14 (43.7%) patients. Postoperative bleeding occurred in four (4%) patients, and there was no leak in this group of patients. The mean follow-up duration was 13.6 ± 3 months. **Conclusion:** Laparoscopic sleeve gastrectomy is an effective procedure for reduction of BMI in obese patients. This results in resolution and improvement of obesity-related comorbid conditions in majority of patients. There was no gastric leak in this group of patients.

Key words: Comorbidities, laparoscopic sleeve gastrectomy, outcome

Access this article online

Quick Response Code:



Website:

www.saudijobesity.com

DOI:

10.4103/2347-2618.158686

INTRODUCTION

Obesity has become one of the major health problems world-wide as it affects more than 1.7 billion.^[1] Obesity is a known risk factor for development of comorbid conditions like, diabetes mellitus, hypertension, sleep apnea, hyperlipidemia, and degenerative joint diseases.^[2]

Address for correspondence: Dr. Dildar Hussain, Department of Surgery, 5 West, Dubai Hospital, PO Box 7272, Dubai, United Arab Emirates. E-mail: docdildar@yahoo.com

Laparoscopic sleeve gastrectomy is a relatively new procedure in the management of morbidly obese patients.^[3] This procedure has shown a significant weight loss, and remission or improvement in obesity-related comorbidities.^[4]

Laparoscopic sleeve gastrectomy is gaining popularity with bariatric surgeons. The surgical procedure is technically less complex and irreversible, therefore surgeons should try to avoid complications.^[5] The advantages of the laparoscopic sleeve gastrectomy include, stomach functions normally, and further adjustment after the surgery is not required, as in gastric band. This procedure removes portion of the stomach that produces ghrelin, which results in reduction of weight by hormonal mechanism.^[6]

The purpose of this study was to determine the outcome of obese patients after laparoscopic sleeve gastrectomy, as our initial experience of Dubai Hospital, in terms of reduction in body mass index (BMI) after surgery, and to determine the complications, such as staple line leakage and hemorrhage.

MATERIALS AND METHODS

This was a descriptive study, and the data was collected retrospectively in Dubai Hospital, Dubai, United Arab Emirates. All patients who underwent laparoscopic sleeve gastrectomy from April 2012 to July 2013 were included in the study. There were 100 patients included in the study. The patients, who were lost for follow-up after surgery, were excluded from the study. Ethical committee approval was obtained from research/ethical committee of Dubai Health Authority.

All patients were required to have routine blood tests, ultrasonography of the abdomen, upper gastrointestinal (GI) endoscopy, and dietitian consultation.

Multiple parameters were studied; including demographic features, BMI, and comorbid conditions of these patients. The duration of surgery, and reduction of BMI at 3, 6, and 12 month's duration after the surgery was calculated. Postoperative complications, including staple line leakage and bleeding were analyzed. Resolution of comorbid conditions were also studied.

A standard operative technique was used for sleeve gastrectomy. Pneumoperitoneum was created by Veress needle. Five trocars were inserted. Greater omentum was divided by Ultra Cision, along the greater curvature of the stomach. Stomach was divided by leaving a sleeve on calibration tube, No. 36 F, from 4 to 6 cm of pylorus to the angle of His, by endostapler. Care was taken to avoid

stricture at incisura angularis and to avoid stapling close to gastroesophageal junction at angle of His. The choice of cartridge was based on the thickness of the stomach wall. Hemostasis was achieved by applying clips to the staple line. Resected part of the stomach was removed through lateral port, and site was closed by endoclosure. A corrugated drain was kept near the stomach, which can be removed on 1st or 2nd postoperative day. Dietician consultation was obtained for the management of the patient's diet.

Statistical analysis

The data was expressed as frequency, percentages, and mean \pm standard deviation. Statistical Package for Social Sciences (SPSS) version 17 was used for data analysis.

RESULTS

A total of 100 patients were included in the study. The mean age of patients was 34 ± 8 years (range: 18–62). There were 79 (79%) female and 21 (21%) male patients. Preoperative mean BMI was 46 ± 6 kg/m² (range: 33–69). Sixteen (16%) patients had diabetes mellitus, 19 (19%) patients had hypertension, nine (9%) patients had joint pain, six (6%) patients had back pain, and three (3%) patients had sleep apnea syndrome as comorbid conditions [Table 1]. *Helicobacter pylori* was positive in 11 (11%) patients, which was treated prior to surgery. Seven (7%) patients had gall stones and two (2%) had iron deficiency anemia. Thirty-two (32%) patients had high serum cholesterol level before surgery. The past surgical history of these patients revealed that two (2%) had laparoscopic cholecystectomy, five (5%) had gastric band removal, three (3%) had liposuction, and seven (7%) had cesarean section.

The mean operative time was 80 ± 23 min (range: 55–149). Five (5%) patients had laparoscopic cholecystectomy and two (2%) patients had paraumbilical hernia repair at the same time. Mean duration of hospital stay was 3 ± 1 days (range: 2–7).

Table 1: Demographic and clinical profile of patients under the study

Demographic features	Number of patients (%)
Gender	
Male	21 (21)
Female	79 (79)
Comorbidities	
Diabetes mellitus	16 (16)
Hypertension	19 (19)
Joint pain	9 (9)
Back pain	6 (6)
Sleep apnea syndrome	3 (3)

The postoperative BMI was calculated at 3, 6, and 12 month's duration, and evolution in BMI is shown in Table 2. The resolution and improvement of obesity-related comorbid conditions in patients after surgery are shown in Table 2. The patients who required fewer doses of medicines for hypertension and diabetes postoperatively were categorized as having improvement in diabetes and hypertension.

Postoperative complications included bleeding in four (4%) patients. One (1%) patient had dropped 2 g of hemoglobin, and had 700 ml of blood in the drain. He was taken to the operation theater and bleeding point was clipped. One (1%) patient had hematemesis and malena. Endoscopy was done and bleeding was controlled endoscopically. One (1%) patient had malena with 0.5 g drop in hemoglobin. He was treated by blood transfusion and improved. One patient was readmitted with abdominal pain, 1 week after discharge. CT scan showed intra-abdominal hematoma, and patient was treated conservatively. No patient had gastric leak. The mean follow-up duration was 13.5 ± 3 months (range: 11-20 months).

DISCUSSION

Surgical management is most effective in decreasing BMI and obesity-related comorbid conditions in morbidly obese patients. Surgical management is recommended in patients with BMI ≥ 40 , or BMI ≥ 35 kg/m² with obesity-related comorbid conditions. A recent update in clinical guidelines has included patients with BMI ≥ 30 kg/m² with a target of weight control, diabetes mellitus, and improve markers of cardiovascular disease risk.^[7] The different surgical procedures for obesity include, laparoscopic gastric band, laparoscopic sleeve gastrectomy, Roux-en-Y gastric bypass (RYGB), and biliopancreatic diversion (BPD)-duodenal switch. The choice of the surgical procedure depends on the aim of weight loss and metabolic control, availability of expertise, preference of the patients, and risk factors of the patients.^[7]

Laparoscopic sleeve gastrectomy was first started as a staged procedure before laparoscopic BPD with duodenal switch, in morbidly obese patients. This has now evolved as a primary procedure in the treatment of morbid obesity.^[8] The mechanism by which sleeve gastrectomy reduces body weight and improves comorbid conditions is, by restriction of the food intake and by hormonal effects due to the decrease in level of ghrelin.^[9]

The mean age of patients in this study was 34 ± 8 years and preoperative BMI was 46 ± 6 kg/m². This shows that our population presented with obesity in early age, as compared to the study by Drake *et al.*^[10] The reduction of BMI after surgery in our study is comparable as described in literature.^[11] Remission of diabetes mellitus was observed (68.85%) and improvement in 31.2% of the patients, which is comparable to results reported by Gill *et al.*^[12] The remission of hypertension was observed in 57.89% and improvement in 42.1% of patients, which is comparable to results reported by Buchwald *et al.*^[13] Four patients in our study had postoperative bleeding, which is a bit higher than reported in literature.^[14] There was no leak in this group of patients.

Randomized trials evaluating laparoscopic sleeve gastrectomy have shown promising results in weight loss after sleeve gastrectomy. The trials reported by Kehagius *et al.*, and Karamanakos *et al.* have shown an excess weight loss (EWL) from 68 to 69% in sleeve gastrectomy group, while 60 to 62% in laparoscopic RYGB (LRYGB) group.^[15] The studies reported by Johnston *et al.*, and Sarela *et al.*, have shown an EWL from 61 to 68% after long-term follow-up of 5 years.^[16,17]

The studies comparing results of resolution of type 2 diabetes mellitus after sleeve gastrectomy, duodenal switch and gastric bypass have shown no significant difference in resolution of diabetes, fasting blood glucose level, and insulin levels.^[18] A number of studies have

Table 2: Effects of LSG on obesity and its related co morbidities in Dubai, UAE

Preoperative BMI	Mean (range)		
	3 months	6 months	12 months
46±6 (33-69) kg/m ²	41±6 (30-60) kg/m ²	37±5 (29-54) kg/m ²	32±5 (25-51) kg/m ²
Preoperative obesity-related comorbidities		Postoperative obesity-related comorbidities	
Comorbid condition	No. of patients (%)	Resolved (%)	Improved (%)
Diabetes mellitus	16 (16)	11 (68.8)	5 (31.2)
Hypertension	19 (19)	11 (57.9)	8 (42.1)
Joint pain	9 (9)	6 (66.6)	3 (33.3)
Sleep apnea syndrome	3 (3)	3 (100)	

BMI: Body mass index

shown resolution of hypertension from 62 to 70% of patients,^[19,20] which is comparable to results after gastric bypass and BPD/duodenal switch.^[13]

Leak after laparoscopic sleeve gastrectomy results in significant morbidity. Its incidence is about 2.2% as reported in literature.^[14] As sleeve gastrectomy is an irreversible procedure, the surgeons should try to avoid this complication. Some technical considerations are to avoid stricture at incisura angularis, and to avoid stapling to close to gastroesophageal junction at the angle of His.^[10] There was no leak in this group of patients.

CONCLUSION

Laparoscopic sleeve gastrectomy is an effective procedure in reducing BMI in morbidly obese patients. This results in resolution and improvement of obesity-related comorbid conditions in majority of the patients. Technical considerations are required to avoid leak after the surgery.

REFERENCES

1. Buchwald H, Ikramuddin S, Dorman RB, Schone JL, Dixon JB. Management of the metabolic/bariatric surgery patient. *Am J Med* 2011;124:1099-105.
2. Lau DC, Douketis JD, Morrison KM, Hramiak IM, Sharma AM. Obesity Canada Clinical Practice Guidelines Expert p. 2006 Canadian clinical practice guidelines on the management and prevention of obesity in adults and children[summary]. *Can Med Assoc J* 2007;176:S1-13.
3. Frezza EE. Laparoscopic vertical sleeve gastrectomy for morbid obesity. The procedure of choice? *Surg Today* 2007;37:275-81.
4. Switzer NJ, Smith A, Birch D, Karmali S. The metabolic effects of laparoscopic sleeve gastrectomy: A review. *J Minim Invasive Surg Sci* 2013;2:3-7.
5. Weiner RA, Weiner S, Pomhoff I, Jacobi C, Makarewicz W, Weigand G. Laparoscopic sleeve gastrectomy-influence of sleeve size and resected gastric volume. *Obes Surg* 2007;17:1297-305.
6. Tucker ON, Szomstein S, Rosenthal RJ. Indications for sleeve gastrectomy as a primary procedure for weight loss in the morbidly obese. *J Gastrointest Surg* 2008;12:662-7.
7. Mechanick JI, Youdin A, Jones DB, Garvey TW, Hurley DL, McMahon MM, *et al.* Clinical practice guidelines for the perioperative nutritional, metabolic, and nonsurgical support of the bariatric surgery patients-213 update. *Surg Obes Related Dis* 2013;9:159-91.
8. Dietel M, Crosby RD, Gagner M. The First International Consensus Summit for Sleeve Gastrectomy (SG), New York City, October 25-27, 2007. *Obes Surg* 2008;18:487-96.
9. Armstrong J, O'Malley SP. Outcomes of sleeve gastrectomy for morbid obesity: A safe and effective procedure? *Int J Surg* 2010;8:69-71.
10. Bellanger DE, Greenway FL. Laparoscopic Sleeve Gastrectomy, 529 Cases Without a Leak: Short Term Results and Technical Considerations. *Obes Surg* 2010.
11. Hady HR, Dadan J, Golaszewski P, Safeijko K. Impact of laparoscopic sleeve gastrectomy on body mass index, ghrelin, insulin and lipid levels in 100 obese patients. *Wideochir Inne Tech Malo Inwazyjne* 2012;7:251-9.
12. Gill RS, Birch DW, Shi X, Sharma AM, Karmali S. Sleeve gastrectomy and type 2 diabetes mellitus: A systematic review. *Surg Obes Relat Dis* 2010;6:707-13.
13. Buchwald H, Avidor Y, Braunwald E, Jensen MD, Pories W, Fahrback K, *et al.* Bariatric surgery: A systematic review and meta analysis. *JAMA* 2004;292:1724-37.
14. Sakran N, Goitein D, Raziell E, Keidar A, Beglaibter N, Grinbaum R, *et al.* Gastric leaks after sleeve gastrectomy: A multicenter experience with 2834 patients. *Surg Endosc* 2013;27:240-5.
15. ASMBS Clinical Issues Committee. Updated position statement on sleeve gastrectomy as a bariatric procedure. *Surg Obes Related Dis* 2012;8:e21-6.
16. Johnston D, Dachtler J, Sue Ling HM, King RF, Martin IG. The Magenstrasse and Mill operation for morbid obesity. *Obes Surg* 2003;13:10-6.
17. Sarela AI, Dexter SP, O'Kane M, Menon A, Mc Mahon MJ. Long term follow up after laparoscopic sleeve gastrectomy: 8-9 year results. *Surg Obes Relat Dis* 2011.
18. Roslin MS, Dudiy Y, Weiskopf J, Damani T, Shah P. Comparison between RYGB, DS, and VSG, effect on glucose homeostasis. *Obes Surg* 2012;22:1281-6.
19. Sarkosh K, Birch DW, Shi X, Gill RS, Karmali S. The impact of sleeve gastrectomy on hypertension: A systematic review. *Obes Surg* 2012.
20. Sarkhosh K, Lai M, Gill R, Birch DW, Karmali S. Laparoscopic sleeve gastrectomy and its effects on hypertension. *J Curr Surg* 2012;2:1-3.

How to cite this article: Hussain D, Naureen S, Ibrahim F, Javed SM, Aziz ZA, Dillemans B. Initial experience with laparoscopic sleeve gastrectomy in Dubai hospital, United Arab Emirates. *Saudi J Obesity* 2015;3:8-11.

Source of Support: Nil, **Conflict of Interest:** None declared.