

COMPARISON OF SHORT-TERM OUTCOMES BETWEEN LAPAROSCOPIC GREATER CURVATURE PPLICATION AND LAPAROSCOPIC SLEEVE GASTRECTOMY

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ABSTRACT: *Background; laparoscopic sleeve gastrectomy (LSG) involves resection of a significant portion of the stomach. Laparoscopic greater curvature plication (LGCP) is a relatively new alternative procedure similar to LSG, but without the need for gastric resection. Patients and methods; one hundred patients included in our study in AL Jadria hospital in Baghdad and were assigned randomly to receive either LGCP (n = 50) [35 women and 15 men; mean age 32.1 years (19-49 years) and mean BMI 44.8 kg/m² (40-50 kg/m²)] or LSG (n = 50) [34 women and 16 men; mean age 34.8 years (18-58 years) and mean BMI 46.8 kg/m² (41-55 kg/m²)] by a block randomization method. Patients were studied in terms of postoperative weight loss, and postoperative complications. Results; All procedures were completed laparoscopically. Follow-up was 24 months. The mean hospital stay was 36 h (range 24-96 h) for both groups. No intraoperative complications occurred. Postoperatively, one case of minor leak was detected after LSG and two cases of stenosis following LGCP. All patients experienced postoperative excess weight loss. Conclusion; LGCP is feasible, safe, and effective, but has an inferior weight-loss effect compared to LSG for morbidly obese patients with BMI above 40 kg/m².*

KEYWORDS: Laparoscopiesleeve Gastrectomy, Stomach, Weight Loss, Surgery

INTRODUCTION

Obesity is a major health problem affecting over 1.7 billion individuals worldwide, and although it was considered a disease of the western world, it seems to have expanded to the developing world, especially in urban settings ⁽¹⁾. Since 1997, the WHO has recognized it as a global epidemic, and in 2005, over 400 million obese adults were recorded. Conservative measures, such as dieting and physical exercise, have proven inadequate, as has treatment with medications ⁽²⁾. There is considerable evidence in the literature on the long-term positive impact of bariatric surgery as a primary therapy for the treatment of obesity and its comorbidities. Significant debate remains as to which patients are optimal candidates for which procedures ⁽³⁾. Traditionally, the primary mechanisms through which bariatric surgery achieves its outcomes are believed to be the mechanical restriction of food intake, reduction in the absorption of ingested foods, or a combination of both ⁽⁴⁾. Adjustable gastric banding and vertical sleeve gastrectomy (VSG) are restrictive approaches used commonly in bariatric practice. Although these procedures have proven to be good therapeutic options for some patients, they are not without significant complications, such as erosion or slippage of the gastric band or gastric leaks in VSG. Leaks in VSG pose a particularly difficult challenge when they occur near the angle of His, potentially generating severe clinical conditions that require reoperation, and may even cause death ^{(5),(6)}. Laparoscopic sleeve (VSG) gastrectomy was first described in 1999 as part of the biliopancreatic diversion duodenal switch procedure ⁽⁷⁾. Subsequently, laparoscopic sleeve gastrectomy (LSG) has been performed as a stand-alone procedure ⁽⁸⁾.

Laparoscopic greater curvature plication (LGCP) is a new restrictive technique that was first reported by Wilkinson in 1981⁽⁹⁾. It reduces the gastric volume successfully by plication of the greater curvature and has the advantage of a reversible restrictive procedure without the use of foreign materials or gastrectomy. The aim of the present study was to investigate LGCP, which is a new restrictive bariatric surgical technique in comparison with the more performed LSG in terms of postoperative weight loss and postoperative complications.

PATIENTS AND METHODS

The study was carried out in AL Jadria hospital and ALKarama University hospital in the period from August 2013 to August 2014. All patients provided signed informed consent and the study was approved by the hospital's ethics committee. One hundred patients fulfilled the National Institutes of Health criteria⁽¹⁰⁾ and were assigned randomly to receive either LGCP ($n = 50$) or LSG ($n = 50$) by a block randomization method. Patients with BMI more than 60 kg/m² were not encouraged to participate in the study. This study was carried out on 50 patients who underwent LSG [34 women and 16 men, mean age 34.8 years (18-58 years) and mean BMI 46.8 kg/m² (41-55 kg/m²), and 50 patients who underwent LGCP [35 women and 15 men, mean age 32.1 years (19-49 years) and mean BMI 44.8 kg/m² (40-50 kg/m²)]. The two groups were studied in terms of postoperative weight loss and postoperative complications. Follow-up was 24 months ([Table 1, table 2 and table 5]).

Table 1 EWL(excessive weight loss)from total body weight in case of laparoscopic greater curvature gastric plication.

TEWL(total excessive weight loss)from total body weight .

Number of patients	Weight of patient	EWL IN 1st month	EWL In 2 nd month	EWL In 3 th month	EWL In 4 th month	EWL In 5 ^t month	EWL In 6 th month	EWL In 7 th month	EWL In 8 th month	EWL In 9 th month	EWL In 10 th month	EWL In 11 th month	EWL 12 th month	TEWL
1	142 Kg	9.5 % 9 kg	.5% 8kg	7.5% 10 kg	3.6 % 5 kg	.6% 5kg	5.2 % 7 kg	5.2 % 7 kg	1.4 % 2 kg	2.3 % 3 kg	1.6 % 2 kg	1.4 % 2 kg	1.4 % 2 kg	45.2 %
2	143 Kg	8.5 % 7 kg	3.6 % 5kg	3.6 % 5kg	6.5 % 8kg	6.5 % 7kg	3.6 % 5kg	6.4% 7.5 kg	3.2 % 4kg	2.1 % 3kg	1.2 % 2 kg	2.1 % 3kg	1.2 % 2 kg	44.4 %
3	138 Kg	7.5 % 8 kg	5.8 % 7kg	3.6 % 5kg	5.6 % 8kg	3.6 % 5kg	5.7 % 7kg	3.6 % 5kg	3.6 % 5kg	1.4 % 2 kg	2.1 % 3kg	1.4 % 2 kg	1.4 % 2 kg	39%
4	129 Kg	8.9 % 6 kg	3.6 % 5kg	5.7 % 7kg	.5% 10kg	5.6 % 8 kg	5.2 % 7 kg	5.7 % 7kg	5.6 % 8 kg	2.1 % 3kg	1.6 % 2 kg	1.6 % 2 kg	1.4 % 2 kg	45.2 %
5	136 Kg	9.5 % 9 kg	5.8 % 7kg	5.2 % 7 kg	.7% 8kg	5.8 % 7kg	3.6 % 5kg	5.2 % 7 kg	5.8 % 7kg	1.2 % 2 kg	1.6 % 2 kg	1.6 % 2 kg	1.6 % 2 kg	44.3 %
6	145 Kg	9.8 % 8 kg	3.6 % 5kg	5.2 % 7 kg	5.1 % 7kg	3.6 % 5kg	3.2 % 4kg	6.2% 7.5kg	.6% 5kg	2.1 % 3kg	0.9 % 1 kg	0.9 % 1 kg	0.9 % 1 kg	39%
7	132 Kg	9.8 % 9 kg	3.6 % 5kg	3.6 % 5kg	6.7 % 8kg	5.7 % 7kg	3.6 % 5kg	3.2 % 4kg	5.6 % 8 kg	1.6 % 2 kg	2.3 % 3 kg	2.3 % 3 kg	2.3 % 3 kg	46.4 %

8	143 Kg	7.3 % 7 kg	5.7 % 7kg	5.6 % 8 kg	7.5 % 10kg	5.2 % 7 kg	5.6 % 8 kg	3.6 % 5kg	5.8 % 7kg	0.9 % 1 kg	3 % 4 kg	3 % 4 kg	3 % 4 kg	48.6 %
9	138 Kg	8.5 % 8kg	5.2 % 7 kg	5.8 % 7kg	5.6 % 8kg	6.2 % 7.5k g	5.8 % 7kg	5.7 % 7kg	5.2 % 7 kg	2.1 % 3kg	1.4 % 2 kg	1.4 % 2 kg	2.1 % 3kg	44.9 %
10	148 Kg	8.7 % 6 kg	5.2 % 7 kg	3.2 % 4 kg	7.5 % 10 kg	3.6 % 5 kg	3.6 % 5kg	5.2 % 7 kg	5.2 % 7 kg	1.4 % 2 kg	2.3 % 3 kg	1.6 % 2 kg	1.4 % 2 kg	41.7 %
11	137 Kg	8.5 % 9 kg	3.6 % 5kg	3.6 % 5kg	5.8 % 5 kg	5.2 % 7 kg	5.7 % 7kg	3.6 % 5kg	6.2 % 7.5k g	1.6 % 2 kg	3 % 4 kg	0.9 % 1 kg	1.6 % 2 kg	44.6 %
12	138 Kg	9.5 % 9kg	5.6 % 8 kg	5.7 % 4kg	5.6 % 8 kg	5.2 % 7 kg	5.2 % 7 kg	3.6 % 5kg	6.2 % 7.5k g	0.9 % 1 kg	3.3 % 4kg	2.3 % 3 kg	0.9 % 1 kg	44.7 %
13	145 kg	8.5 % 8 kg	5.8 % 7kg	5.2 % 7 kg	6.5 % 5kg	6.2 % 7.5k g	3.6 % 5kg	5.7 % 7kg	3.6 % 5 kg	1.2 % 2 kg	1.2 % 2 kg	3 % 4 kg	1.2 % 2 kg	45%
14	122 kg	7.5 % 7kg	3.2 % 4 kg	6.2 % 7.5k g	5.6 % 8kg	6.2 % 7.5k g	3.6 % 5kg	5.2 % 7 kg	3.6 % 5kg	2.1 % 3kg	1.4 % 2 kg	1.4 % 2 kg	2.1 % 3kg	41.8 %
15	133 kg	8.9 % 9 kg	3.6 % 5kg	3.6 % 5 kg	7.5 % 8 kg	3.6 % 5 kg	6.2 % 7.5k g	5.2 % 7 kg	6.4 % 7.5 kg	1.2 % 2 kg	2.3 % 3 kg	1.6 % 2 kg	2.3 % 3 kg	45%
16	130 kg	9.5 % 9 kg	5.7 % 4kg	5.2 % 7 kg	5.1 % 7kg	5.2 % 7 kg	3.6 % 5 kg	3.6 % 5kg	3.6 % 5kg	1.6 % 2 kg	3 % 4 kg	0.9 % 1 kg	3 % 4 kg	40.8 %
17	142 kg	9.8 % 8 kg	5.2 % 7 kg	6.4 % 7.5 kg	7.5 % 10 kg	5.2 % 7 kg	3.2 % 4kg	5.6 % 8 kg	5.7 % 7kg	0.9 % 1 kg	3.3 % 4kg	1.2 % 2 kg	3.3 % 4kg	48.4 %
18	147 Kg	7.3 % 9 kg	6.2 % 7.5k g	3.6 % 5kg	5.8 % 7 kg	3.6 % 5kg	3.2 % 4kg	5.8 % 7kg	5.2 % 7 kg	2.1 % 3kg	1.2 % 2 kg	2.1 % 3kg	2.1 % 3kg	44.2 %
19	135 Kg	8.5 % 7 kg	3.6 % 5 kg	5.7 % 7kg	5.6 % 8 kg	6.5 % 7kg	3.6 % 5kg	3.2 % 4 kg	6.2 % 7.5k g	1.4 % 2 kg	2.1 % 3kg	1.2 % 2 kg	2.1 % 3kg	41.3 %
20	139 Kg	8.7 % 9 kg	5.2 % 7 kg	5.2 % 7 kg	5.6 % 5 kg	3.6 % 5kg	5.7 % 7kg	3.6 % 5kg	3.6 % 5kg	1.6 % 2 kg	2.3 % 3 kg	1.6 % 2 kg	2.1 % 3kg	40.3 %
21	139 Kg	8.5 % 9 kg	6.4 % 7.5 kg	6.2 % 7.5k g	7.5 % 5kg	5.6 % 4kg	5.2 % 7 kg	5.7 % 4kg	5.7 % 7kg	0.9 % 1 kg	3 % 4 kg	0.9 % 1 kg	2.3 % 3 kg	45.2 %
22	144 Kg	9.5 % 8 kg	3.6 % 5kg	3.2 % 4kg	6.7 % 8kg	5.8 % 7kg	5.2 % 7 kg	5.2 % 7 kg	5.2 % 7 kg	2.1 % 3kg	3.3 % 4kg	1.6 % 2 kg	3 % 4 kg	44.4 %

23	145 kg	8.5 % 10 kg	5.7 % 7kg	3.6 % 5kg	5.1 % 7kg	6.2 % 7.5k g	5.2 % 7 kg	6.2 % 7.5k g	5.2 % 7 kg	1.2 % 2 kg	1.2 % 2 kg	0.9 % 1 kg	3.3 % 4kg	39%
24	124 kg	9.8 % 7 kg	5.2 % 7 kg	5.7 % 7kg	6.7 % 8kg	3.6 % 5 kg	5.2 % 7 kg	3.6 % 5 kg	5.2 % 7 kg	2.1 % 3kg	1.4 % 2 kg	1.4 % 2 kg	2.1 % 3kg	45.2 %
25	125 Kg	7.3 % 8 kg	6.2 % 7.5k g	5.2 % 7 kg	3.6 % 5 kg	3.6 % 5kg	5.2 % 7 kg	5.2 % 7 kg	1.4 % 2 kg	2.3 % 3 kg	1.6 % 2 kg	1.4 % 2 kg	1.4 % 2 kg	44.3 %
26	143 Kg	8.5 % 9 kg	3.2 % 4kg	3.6 % 5kg	6.5 % 8kg	6.5 % 7kg	3.6 % 5kg	6.4 % 7.5 kg	3.2 % 4kg	2.1 % 3kg	1.2 % 2 kg	2.1 % 3kg	1.2 % 2 kg	39%
27	139 Kg	8.7 % 8 kg	3.6 % 5kg	3.6 % 5kg	5.6 % 8kg	3.6 % 5kg	5.7 % 7kg	3.6 % 5kg	3.6 % 5kg	1.4 % 2 kg	2.1 % 3kg	1.4 % 2 kg	1.4 % 2 kg	46.4 %
28	119 Kg	8.5 % 7 kg	5.7 % 7kg	5.7 % 7kg	7.5 % 10kg	5.6 % 8 kg	5.2 % 7 kg	5.7 % 7kg	5.6 % 8 kg	2.1 % 3kg	1.6 % 2 kg	1.6 % 2 kg	1.4 % 2 kg	48.6 %
29	139 Kg	9.5 % 7 kg	5.2 % 7 kg	5.2 % 7 kg	6.7 % 8kg	5.8 % 7kg	3.6 % 5kg	5.2 % 7 kg	5.8 % 7kg	1.2 % 2 kg	1.6 % 2 kg	1.6 % 2 kg	1.6 % 2 kg	44.9 %
30	117 Kg	8.5 % 8 kg	3.6 % 5kg	5.2 % 7 kg	5.1 % 7kg	3.6 % 5kg	3.2 % 4kg	6.2 % 7.5k g	3.6 % 5kg	2.1 % 3kg	0.9 % 1 kg	0.9 % 1 kg	0.9 % 1 kg	41.7 %
31	149 kg	7.5 % 9 kg	3.6 % 5kg	3.6 % 5kg	6.7 % 8kg	5.7 % 7kg	3.6 % 5kg	3.2 % 4kg	5.6 % 8 kg	1.6 % 2 kg	2.3 % 3 kg	2.3 % 3 kg	2.3 % 3 kg	44.6 %
32	137 Kg	9.8 % 8 kg	5.7 % 7kg	5.6 % 8 kg	7.5 % 10kg	5.2 % 7 kg	5.6 % 8 kg	3.6 % 5kg	5.8 % 7kg	0.9 % 1 kg	3 % 4 kg	3 % 4 kg	3 % 4 kg	44.7 %
33	128 Kg	7.3 % 8 kg	5.2 % 7 kg	5.8 % 7kg	5.6 % 8kg	6.2 % 7.5k g	5.8 % 7kg	5.7 % 7kg	5.2 % 7 kg	2.1 % 3kg	1.4 % 2 kg	1.4 % 2 kg	2.1 % 3kg	45%
34	118 Kg	8.9 % 9 kg	5.2 % 7 kg	3.2 % 4 kg	7.5 % 10 kg	3.6 % 5 kg	3.6 % 5kg	5.2 % 7 kg	5.2 % 7 kg	1.4 % 2 kg	2.3 % 3 kg	1.6 % 2 kg	1.4 % 2 kg	41.8 %
35	137 Kg	9.5 % 7 kg	3.6 % 5kg	3.6 % 5kg	5.8 % 5 kg	5.2 % 7 kg	5.7 % 7kg	3.6 % 5kg	6.2 % 7.5k g	1.6 % 2 kg	3 % 4 kg	0.9 % 1 kg	1.6 % 2 kg	45%
36	138 Kg	9.8 % 8 kg	5.6 % 8 kg	3.6 % 5kg	5.6 % 8 kg	5.2 % 7 kg	5.2 % 7 kg	3.6 % 5kg	6.2 % 7.5k g	0.9 % 1 kg	3.3 % 4kg	2.3 % 3 kg	0.9 % 1 kg	40.8 %
37	147 kg	9.8 % 9 kg	5.8 % 7kg	5.7 % 7kg	6.5 % 5kg	6.2 % 7.5k g	3.6 % 5kg	5.7 % 7kg	3.6 % 5 kg	1.2 % 2 kg	1.2 % 2 kg	3 % 4 kg	1.2 % 2 kg	48.4 %
38	125 kg	7.3 % 7 kg	3.2 % 4 kg	5.2 % 7 kg	5.6 % 8kg	6.2 % 7.5k g	3.6 % 5kg	5.2 % 7 kg	3.6 % 5kg	2.1 % 3kg	1.4 % 2 kg	1.4 % 2 kg	2.1 % 3kg	44.2 %

39	155k g	8.5 % 10 kg	3.6 % 5 kg	5.2 % 7 kg	7.5 % 8 kg	3.6 % 5 kg	6.2 % 7.5k g	5.2 % 7 kg	6.4 % 7.5 kg	1.2 % 2 kg	2.3 % 3 kg	1.6 % 2 kg	2.3 % 3 kg	41.3 %
40	139 Kg	9.5 % 9 kg	5.2 % 7 kg	3.6 % 5kg	5.1 % 7kg	5.2 % 7 kg	3.6 % 5 kg	3.6 % 5kg	3.6 % 5kg	1.6 % 2 kg	3 % 4 kg	0.9 % 1 kg	3 % 4 kg	40.3 %
41	119 Kg	8.5 % 7 kg	6.4 % 7.5 kg	5.6 % 8 kg	7.5 % 10 kg	5.2 % 7 kg	3.2 % 4kg	5.6 % 8 kg	5.7 % 7kg	0.9 % 1 kg	3.3 % 4kg	1.2 % 2 kg	3.3 % 4kg	40..8 %
42	139 Kg	7.5 % 8 kg	3.6 % 5kg	5.8 % 7kg	5.8 % 7 kg	3.6 % 5kg	3.2 % 4kg	5.8 % 7kg	5.2 % 7 kg	2.1 % 3kg	1.2 % 2 kg	2.1 % 3kg	2.1 % 3kg	40..8 %
43	117 Kg	8.9 % 6 kg	5.7 % 7kg	3.2 % 4 kg	5.6 % 8 kg	6.5 % 7kg	3.6 % 5kg	3.2 % 4 kg	6.2 % 7.5k g	1.4 % 2 kg	2.1 % 3kg	1.2 % 2 kg	2.1 % 3kg	45.2 %
44	149 kg	9.5 % 9 kg	5.2 % 7 kg	3.6 % 5kg	5.6 % 5 kg	3.6 % 5kg	5.7 % 7kg	3.6 % 5kg	3.6 % 5kg	1.6 % 2 kg	2.3 % 3 kg	1.6 % 2 kg	2.1 % 3kg	45%
45	137 Kg	9.8 % 8 kg	6.2 % 7.5k g	5.7 % 4kg	7.5 % 5kg	5.6 % 4kg	5.2 % 7 kg	5.7 % 4kg	5.7 % 7kg	0.9 % 1 kg	3 % 4 kg	0.9 % 1 kg	2.3 % 3 kg	41.8 %
46	128 Kg	9.8 % 9 kg	3.2 % 4kg	5.2 % 7 kg	6.7 % 8kg	5.8 % 7kg	5.2 % 7 kg	5.2 % 7 kg	5.2 % 7 kg	2.1 % 3kg	3.3 % 4kg	1.6 % 2 kg	3 % 4 kg	45%
47	118 Kg	7.3 % 7 kg	3.6 % 7.5k g	6.2 % 7.5k g	5.1 % 7kg	6.2 % 7.5k g	5.2 % 7 kg	6.2 % 7.5k g	5.2 % 7 kg	1.2 % 2 kg	1.2 % 2 kg	0.9 % 1 kg	3.3 % 4kg	40..8 %
48	137 Kg	8.5 % 8kg	5.7 % 7kg	3.6 % 5 kg	6.7 % 8kg	3.6 % kg	5.2 % 7 kg	3.6 % 5 kg	5.2 % 7 kg	2.1 % 3kg	1.4 % 2 kg	1.4 % 2 kg	2.1 % 3kg	48.4 %
49	149 kg	8.7 % 6 kg	5.2 % 7 kg	5.2 % 7 kg	3.6 % 5 kg	3.6 % 5kg	5.2 % 7 kg	5.2 % 7 kg	1.4 % 2 kg	2.3 % 3 kg	1.6 % 2 kg	1.4 % 2 kg	1.4 % 2 kg	44.2 %
50	137 Kg	9.8 % 8 kg	3.6 % 5kg	6.4 % 7.5 kg	5.6 % 8kg	5.7 % 7kg	5.2 % 7 kg	5.2 % 7 kg	5.7 % 7kg	1.2 % 2 kg	5.7 % 7kg	2.3 % 3 kg	1.6 % 2 kg	41.3 %

Table 2 EWL(excessive weight loss)from total body weight in case of laparoscopic sleeve gastrectomy.

Number of patients	Weight of patient	EWL IN 1st month	EWL In 2 nd month	EWL In 3 th month	EWL In 4 th month	EWL In 5 th month	EWL In 6 th month	EWL In 7 th month	EWL In 8 th month	EWL In 9 th month	EWL In 10 th month	EWL In 11 th month	EWL 12 th month	TEWL
1	145 kg	9.5 % 9 kg	8.5 % 8kg	7.5 % 10 kg	3.6 % 5 kg	3.6 % 5kg	5.2 % 7 kg	5.2 % 7 kg	1.4 % 2 kg	2.3 % 3 kg	1.6 % 2 kg	1.4 % 2 kg	1.4 % 2 kg	45.2 %
2	122 kg	8.5 % 7 kg	3.6 % 5kg	3.6 % 5kg	6.5 % 8kg	6.5 % 7kg	3.6 % 5kg	6.4 % 7.5 kg	3.2 % 4kg	2.1 % 3kg	1.2 % 2 kg	2.1 % 3kg	1.2 % 2 kg	44.4 %
3	133 kg	7.5 % 8 kg	5.8 % 7kg	3.6 % 5kg	5.6 % 8kg	3.6 % 5kg	5.7 % 7kg	3.6 % 5kg	3.6 % 5kg	1.4 % 2 kg	2.1 % 3kg	1.4 % 2 kg	1.4 % 2 kg	44%
4	130 kg	8.9 % 6 kg	3.6 % 5kg	5.7 % 7kg	7.5 % 10kg	5.6 % 8 kg	5.2 % 7 kg	5.7 % 7kg	5.6 % 8 kg	2.1 % 3kg	1.6 % 2 kg	1.6 % 2 kg	1.4 % 2 kg	45.2 %
5	142 kg	9.5 % 9 kg	5.8 % 7kg	5.2 % 7 kg	6.7 % 8kg	5.8 % 7kg	3.6 % 5kg	5.2 % 7 kg	5.8 % 7kg	1.2 % 2 kg	1.6 % 2 kg	1.6 % 2 kg	1.6 % 2 kg	44.3 %
6	147 Kg	9.8 % 8 kg	3.6 % 5kg	5.2 % 7 kg	5.1 % 7kg	3.6 % 5kg	3.2 % 4kg	6.2 % 7.5kg	3.6 % 5kg	2.1 % 3kg	0.9 % 1 kg	0.9 % 1 kg	0.9 % 1 kg	39%
7	135 Kg	9.8 % 9 kg	3.6 % 5kg	3.6 % 5kg	6.7 % 8kg	5.7 % 7kg	3.6 % 5kg	3.2 % 4kg	5.6 % 8 kg	1.6 % 2 kg	2.3 % 3 kg	2.3 % 3 kg	2.3 % 3 kg	46.4 %
8	139 Kg	7.3 % 7 kg	5.7 % 7kg	5.6 % 8 kg	7.5 % 10kg	5.2 % 7 kg	5.6 % 8 kg	3.6 % 5kg	5.8 % 7kg	0.9 % 1 kg	3 % 4 kg	3 % 4 kg	3 % 4 kg	48.6 %
9	139 Kg	8.5 % 8kg	5.2 % 7 kg	5.8 % 7kg	5.6 % 8kg	6.2 % 7.5kg	5.8 % 7kg	5.7 % 7kg	5.2 % 7 kg	2.1 % 3kg	1.4 % 2 kg	1.4 % 2 kg	2.1 % 3kg	44.9 %
10	144 Kg	8.7 % 6 kg	5.2 % 7 kg	3.2 % 4 kg	7.5 % 10 kg	3.6 % 5 kg	3.6 % 5kg	5.2 % 7 kg	5.2 % 7 kg	1.4 % 2 kg	2.3 % 3 kg	1.6 % 2 kg	1.4 % 2 kg	49.7 %
11	145 kg	8.5 % 9 kg	3.6 % 5kg	3.6 % 5kg	5.8 % 5 kg	5.2 % 7 kg	5.7 % 7kg	3.6 % 5kg	6.2 % 7.5kg	1.6 % 2 kg	3 % 4 kg	0.9 % 1 kg	1.6 % 2 kg	44.6 %
12	138 Kg	9.5 % 9kg	5.6 % 8 kg	5.7 % 4kg	5.6 % 8 kg	5.2 % 7 kg	5.2 % 7 kg	3.6 % 5kg	6.2 % 7.5kg	0.9 % 1 kg	3.3 % 4kg	2.3 % 3 kg	0.9 % 1 kg	44.7 %
13	137 Kg	8.5 % 8 kg	5.8 % 7kg	5.2 % 7 kg	6.5 % 5kg	6.2 % 7.5kg	3.6 % 5kg	5.7 % 7kg	3.6 % 5 kg	1.2 % 2 kg	1.2 % 2 kg	3 % 4 kg	1.2 % 2 kg	45%
14	138 Kg	7.5 % 7kg	3.2 % 4 kg	6.2 % 7.5kg	5.6 % 8kg	6.2 % 7.5kg	3.6 % 5kg	5.2 % 7 kg	3.6 % 5kg	2.1 % 3kg	1.4 % 2 kg	1.4 % 2 kg	2.1 % 3kg	41.8 %

15	147 kg	8.9 % 9 kg	3.6 % 5kg	3.6 % 5 kg	7.5 % 8 kg	3.6 % 5 kg	6.2 % 7.5kg g	5.2 % 7 kg	6.4 % 7.5 kg	1.2 % 2 kg	2.3 % 3 kg	1.6 % 2 kg	2.3 % 3 kg	45%
16	125 kg	9.5 % 9 kg	5.7 % 4kg	5.2 % 7 kg	5.1 % 7kg	5.2 % 7 kg	3.6 % 5 kg	3.6 % 5kg	3.6 % 5kg	1.6 % 2 kg	3 % 4 kg	0.9 % 1 kg	3 % 4 kg	45.8 %
17	155kg g	9.8 % 8 kg	5.2 % 7 kg	6.4 % 7.5 kg	7.5 % 10 kg	5.2 % 7 kg	3.2 % 4kg	5.6 % 8 kg	5.7 % 7kg	0.9 % 1 kg	3.3 % 4kg	1.2 % 2 kg	3.3 % 4kg	48.4 %
18	139 Kg	7.3 % 9 kg	6.2 % 7.5kg g	3.6 % 5kg	5.8 % 7 kg	3.6 % 5kg	3.2 % 4kg	5.8 % 7kg	5.2 % 7 kg	2.1 % 3kg	1.2 % 2 kg	2.1 % 3kg	2.1 % 3kg	44.2 %
19	119 Kg	8.5 % 7 kg	3.6 % 5 kg	5.7 % 7kg	5.6 % 8 kg	6.5 % 7kg	3.6 % 5kg	3.2 % 4 kg	6.2 % 7.5kg g	1.4 % 2 kg	2.1 % 3kg	1.2 % 2 kg	2.1 % 3kg	41.3 %
20	139 Kg	8.7 % 9 kg	5.2 % 7 kg	5.2 % 7 kg	5.6 % 5 kg	3.6 % 5kg	5.7 % 7kg	3.6 % 5kg	3.6 % 5kg	1.6 % 2 kg	2.3 % 3 kg	1.6 % 2 kg	2.1 % 3kg	40.3 %
21	117 Kg	8.5 % 9 kg	6.4 % 7.5 kg	6.2 % 7.5kg g	7.5 % 5kg	5.6 % 4kg	5.2 % 7 kg	5.7 % 4kg	5.7 % 7kg	0.9 % 1 kg	3 % 4 kg	0.9 % 1 kg	2.3 % 3 kg	45.2 %
22	138 Kg	9.5 % 8 kg	3.6 % 5kg	3.2 % 4kg	6.7 % 8kg	5.8 % 7kg	5.2 % 7 kg	5.2 % 7 kg	5.2 % 7 kg	2.1 % 3kg	3.3 % 4kg	1.6 % 2 kg	3 % 4 kg	47.4 %
23	147 kg	8.5 % 10 kg	5.7 % 7kg	3.6 % 5kg	5.1 % 7kg	6.2 % 7.5kg g	5.2 % 7 kg	6.2 % 7.5kg g	5.2 % 7 kg	1.2 % 2 kg	1.2 % 2 kg	0.9 % 1 kg	3.3 % 4kg	39%
24	124 kg	9.8 % 7 kg	5.2 % 7 kg	5.7 % 7kg	6.7 % 8kg	3.6 % 5 kg	5.2 % 7 kg	3.6 % 5 kg	5.2 % 7 kg	2.1 % 3kg	1.4 % 2 kg	1.4 % 2 kg	2.1 % 3kg	45.2 %
25	125 Kg	7.3 % 8 kg	6.2 % 7.5kg g	5.2 % 7 kg	3.6 % 5 kg	3.6 % 5kg	5.2 % 7 kg	5.2 % 7 kg	1.4 % 2 kg	2.3 % 3 kg	1.6 % 2 kg	1.4 % 2 kg	1.4 % 2 kg	44.3 %
26	143 Kg	8.5 % 9 kg	3.2 % 4kg	3.6 % 5kg	6.5 % 8kg	6.5 % 7kg	3.6 % 5kg	6.4 % 7.5 kg	3.2 % 4kg	2.1 % 3kg	1.2 % 2 kg	2.1 % 3kg	1.2 % 2 kg	39%
27	139 Kg	8.7 % 8 kg	3.6 % 5kg	3.6 % 5kg	5.6 % 8kg	3.6 % 5kg	5.7 % 7kg	3.6 % 5kg	3.6 % 5kg	1.4 % 2 kg	2.1 % 3kg	1.4 % 2 kg	1.4 % 2 kg	46.4 %
28	119 Kg	8.5 % 7 kg	5.7 % 7kg	5.7 % 7kg	7.5 % 10kg	5.6 % 8 kg	5.2 % 7 kg	5.7 % 7kg	5.6 % 8 kg	2.1 % 3kg	1.6 % 2 kg	1.6 % 2 kg	1.4 % 2 kg	48.6 %
29	139 Kg	9.5 % 7 kg	5.2 % 7 kg	5.2 % 7 kg	6.7 % 8kg	5.8 % 7kg	3.6 % 5kg	5.2 % 7 kg	5.8 % 7kg	1.2 % 2 kg	1.6 % 2 kg	1.6 % 2 kg	1.6 % 2 kg	44.9 %

30	142 kg	8.5 % 8 kg	3.6 % 5kg	5.2 % 7 kg	5.1 % 7kg	3.6 % 5kg	3.2 % 4kg	6.2 % 7.5k g	3.6 % 5kg	2.1 % 3kg	0.9 % 1 kg	0.9 % 1 kg	0.9 % 1 kg	41.7 %
31	147 Kg	7.5 % 9 kg	3.6 % 5kg	3.6 % 5kg	6.7 % 8kg	5.7 % 7kg	3.6 % 5kg	3.2 % 4kg	5.6 % 8 kg	1.6 % 2 kg	2.3 % 3 kg	2.3 % 3 kg	2.3 % 3 kg	44.6 %
32	135 Kg	9.8 % 8 kg	5.7 % 7kg	5.6 % 8 kg	7.5 % 10kg	5.2 % 7 kg	5.6 % 8 kg	3.6 % 5kg	5.8 % 7kg	0.9 % 1 kg	3 % 4 kg	3 % 4 kg	3 % 4 kg	44.7 %
33	139 Kg	7.3 % 8 kg	5.2 % 7 kg	5.8 % 7kg	5.6 % 8kg	6.2 % 7.5k g	5.8 % 7kg	5.7 % 7kg	5.2 % 7 kg	2.1 % 3kg	1.4 % 2 kg	1.4 % 2 kg	2.1 % 3kg	45%
34	139 Kg	8.9 % 9 kg	5.2 % 7 kg	3.2 % 4 kg	7.5 % 10 kg	3.6 % 5 kg	3.6 % 5kg	5.2 % 7 kg	5.2 % 7 kg	1.4 % 2 kg	2.3 % 3 kg	1.6 % 2 kg	1.4 % 2 kg	41.8 %
35	144 Kg	9.5 % 7 kg	3.6 % 5kg	3.6 % 5kg	5.8 % 5 kg	5.2 % 7 kg	5.7 % 7kg	3.6 % 5kg	6.2 % 7.5k g	1.6 % 2 kg	3 % 4 kg	0.9 % 1 kg	1.6 % 2 kg	45%
36	145 kg	9.8 % 8 kg	5.6 % 8 kg	3.6 % 5kg	5.6 % 8 kg	5.2 % 7 kg	5.2 % 7 kg	3.6 % 5kg	6.2 % 7.5k g	0.9 % 1 kg	3.3 % 4kg	2.3 % 3 kg	0.9 % 1 kg	40.8 %
37	142 kg	9.8 % 9 kg	5.8 % 7kg	5.7 % 7kg	6.5 % 5kg	6.2 % 7.5k g	3.6 % 5kg	5.7 % 7kg	3.6 % 5 kg	1.2 % 2 kg	1.2 % 2 kg	3 % 4 kg	1.2 % 2 kg	48.4 %
38	147 Kg	7.3 % 7 kg	3.2 % 4 kg	5.2 % 7 kg	5.6 % 8kg	6.2 % 7.5k g	3.6 % 5kg	5.2 % 7 kg	3.6 % 5kg	2.1 % 3kg	1.4 % 2 kg	1.4 % 2 kg	2.1 % 3kg	44.2 %
39	135 Kg	8.5 % 10 kg	3.6 % 5 kg	5.2 % 7 kg	7.5 % 8 kg	3.6 % 5 kg	6.2 % 7.5k g	5.2 % 7 kg	6.4 % 7.5 kg	1.2 % 2 kg	2.3 % 3 kg	1.6 % 2 kg	2.3 % 3 kg	41.3 %
40	139 Kg	9.5 % 9 kg	5.2 % 7 kg	3.6 % 5kg	5.1 % 7kg	5.2 % 7 kg	3.6 % 5 kg	3.6 % 5kg	3.6 % 5kg	1.6 % 2 kg	3 % 4 kg	0.9 % 1 kg	3 % 4 kg	47.3 %
41	139 Kg	8.5 % 7 kg	6.4 % 7.5 kg	5.6 % 8 kg	7.5 % 10 kg	5.2 % 7 kg	3.2 % 4kg	5.6 % 8 kg	5.7 % 7kg	0.9 % 1 kg	3.3 % 4kg	1.2 % 2 kg	3.3 % 4kg	40.8 %
42	144 Kg	7.5 % 8 kg	3.6 % 5kg	5.8 % 7kg	5.8 % 7 kg	3.6 % 5kg	3.2 % 4kg	5.8 % 7kg	5.2 % 7 kg	2.1 % 3kg	1.2 % 2 kg	2.1 % 3kg	2.1 % 3kg	48.8 %
43	145 kg	8.9 % 6 kg	5.7 % 7kg	3.2 % 4 kg	5.6 % 8 kg	6.5 % 7kg	3.6 % 5kg	3.2 % 4 kg	6.2 % 7.5k g	1.4 % 2 kg	2.1 % 3kg	1.2 % 2 kg	2.1 % 3kg	45.2 %
44	142 kg	9.5 % 9 kg	5.2 % 7 kg	3.6 % 5kg	5.6 % 5 kg	3.6 % 5kg	5.7 % 7kg	3.6 % 5kg	3.6 % 5kg	1.6 % 2 kg	2.3 % 3 kg	1.6 % 2 kg	2.1 % 3kg	45%

45	147 Kg	9.8 % 8 kg	6.2 % 7.5kg	5.7 % 4kg	7.5 % 5kg	5.6 % 4kg	5.2 % 7 kg	5.7 % 4kg	5.7 % 7kg	0.9 % 1 kg	3 % 4 kg	0.9 % 1 kg	2.3 % 3 kg	41.8 %
46	135 Kg	9.8 % 9 kg	3.2 % 4kg	5.2 % 7 kg	6.7 % 8kg	5.8 % 7kg	5.2 % 7 kg	5.2 % 7 kg	5.2 % 7 kg	2.1 % 3kg	3.3 % 4kg	1.6 % 2 kg	3 % 4 kg	45%
47	139 Kg	7.3 % 7 kg	3.6 % 5kg	6.2 % 7.5kg	5.1 % 7kg	6.2 % 7.5kg	5.2 % 7 kg	6.2 % 7.5kg	5.2 % 7 kg	1.2 % 2 kg	1.2 % 2 kg	0.9 % 1 kg	3.3 % 4kg	49..8 %
48	139 Kg	8.5 % 8kg	5.7 % 7kg	3.6 % 5 kg	6.7 % 8kg	3.6 % 5 kg	5.2 % 7 kg	3.6 % 5 kg	5.2 % 7 kg	2.1 % 3kg	1.4 % 2 kg	1.4 % 2 kg	2.1 % 3kg	48.4 %
49	144 Kg	8.7 % 6 kg	5.2 % 7 kg	5.2 % 7 kg	3.6 % 5 kg	3.6 % 5kg	5.2 % 7 kg	5.2 % 7 kg	1.4 % 2 kg	2.3 % 3 kg	1.6 % 2 kg	1.4 % 2 kg	1.4 % 2 kg	44.2 %
50	145 kg	9.8 % 8 kg	3.6 % 5kg	6.4 % 7.5 kg	5.6 % 8kg	5.7 % 7kg	5.2 % 7 kg	5.2 % 7 kg	5.7 % 7kg	1.2 % 2 kg	5.7 % 7kg	2.3 % 3 kg	1.6 % 2 kg	48.3 %

Change in body weight (LSG.laprosopic sleeve gastrectomy)

Figure 1 Comparison between two study groups in terms of weight before, after and its change after operation. LGCP, laparoscopic greater curvature plication; LSG, laparoscopic sleeve gastrectomy.

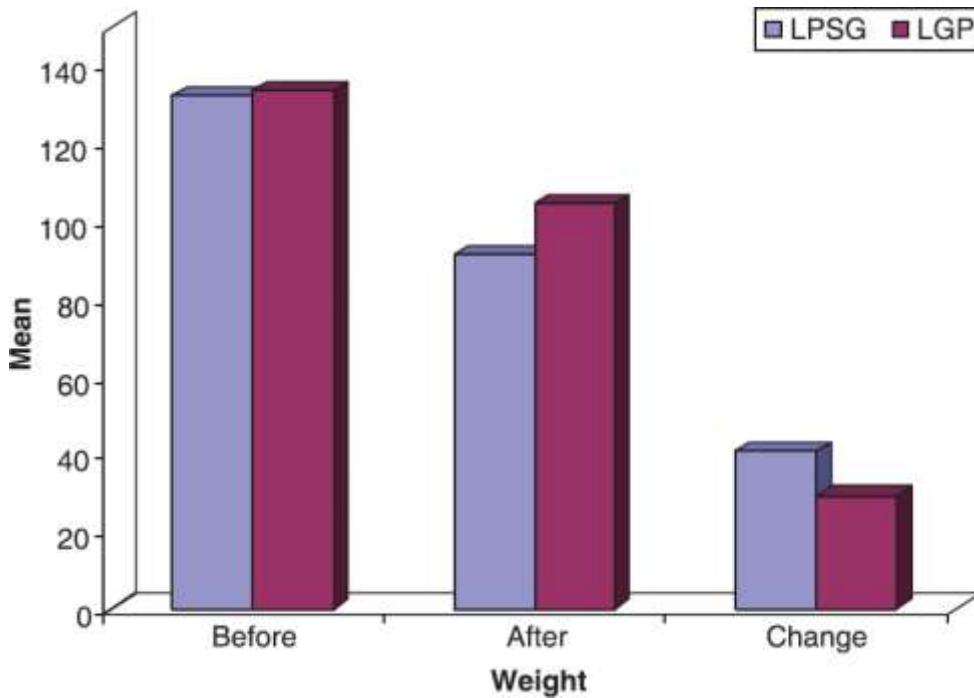


Table 3 Comparison between two study groups in terms of weight before, after and its change after operation. LGCP, laparoscopic greater curvature plication; LSG, laparoscopic sleeve gastrectomy.

Weight (kg)	LSG Mean	LGCP Mean	P	significance
Weight before	132.32+_13.35	133.92+_12.97	0.669	NS
Weight after	91.40+_9.57	104.68+_8.94	0.0001	HS
Weight change	40.92+_9.41	29.24+_8.42	0.0001	HS

HS.highly significant, LGCP.laparoscopic greater curvature plication, LSG.laparoscopic sleeve gastrectomy

Change in BMI(body mass index)

Figure 2 Comparison between two study groups in terms of BMI before, after and its change after operation. LGCP, laparoscopic greater curvature plication; LSG, laparoscopic sleeve gastrectomy.

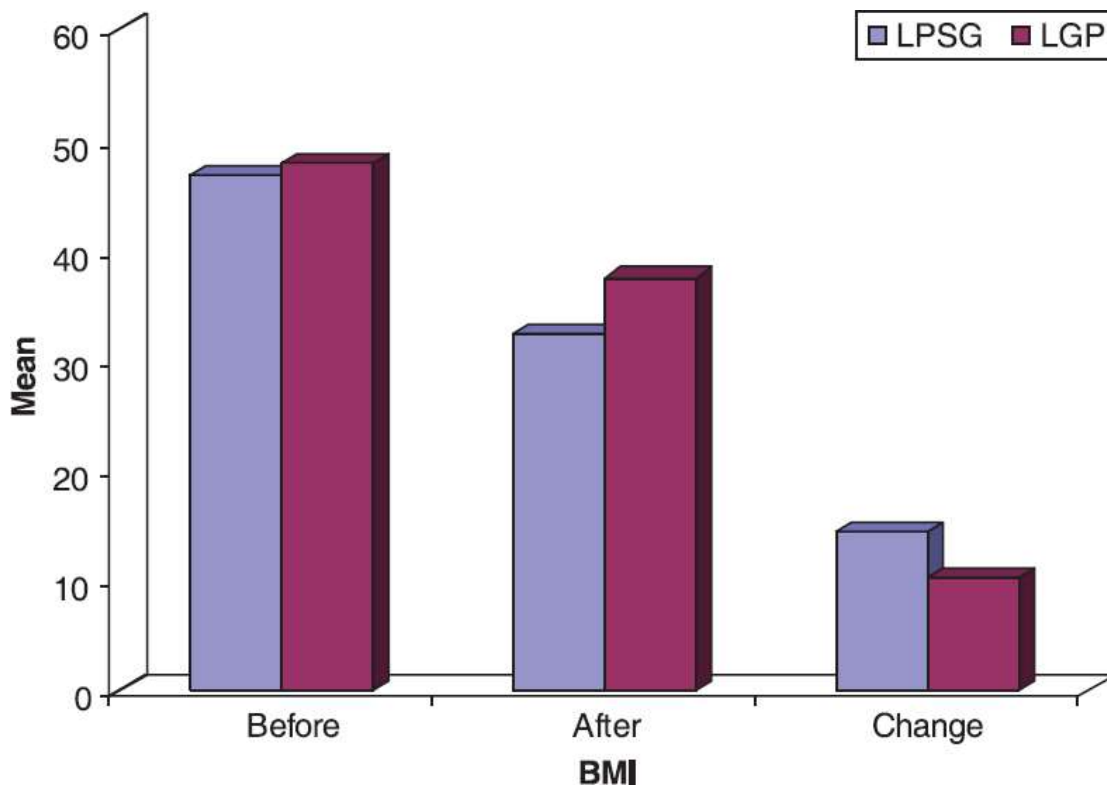


Table 4 Comparison between two study groups in terms of BMI before, after and its change after operation. LGCP, laparoscopic greater curvature plication; LSG, laparoscopic sleeve gastrectomy.

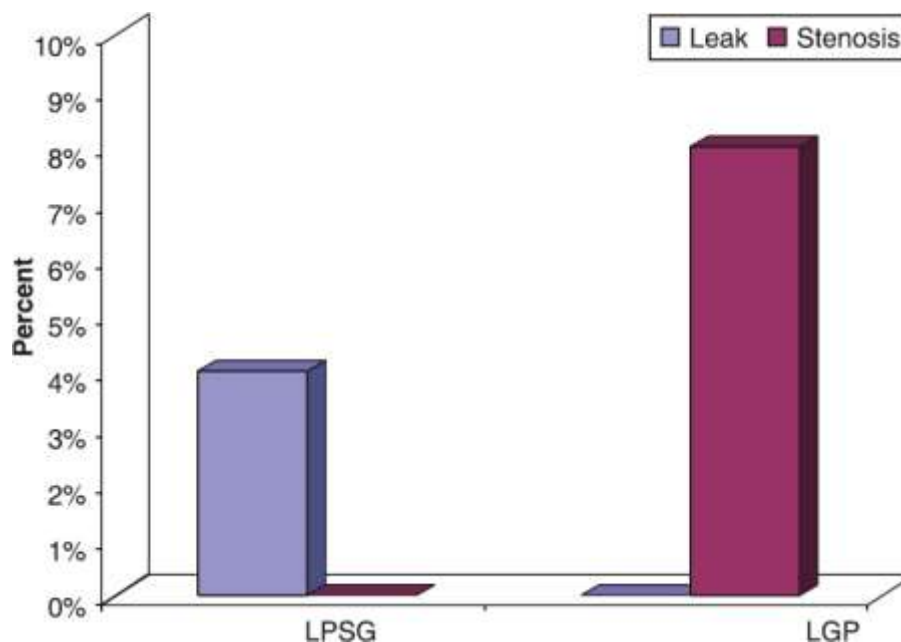
BMI	LSG mean	LGCP mean	P	Significance
BMI before	46.76	47.80	0.328	NS
BMI after	32.31	37.45	0.0001	HS
BMI change	14.45	10.35	0.0001	HS

HS.highly significant, LGCP.laparoscopic greater curvature plication, LSG.laparoscopic sleeve gastrectomy

Table 5 Comparison between two study groups in terms of postoperative leak and stenosis. LGCP, laparoscopic greater curvature plication; LSG, laparoscopic sleeve gastrectomy.

Complication	LSG[N(%)]	LGCP[N(%)]	P	Significance
Leak				NS
Yes	1(4.0)	0(0.0)	1.00	
No	49(96.0)	50(100.0)		
Stenosis				NS
Yes	0(0.0)	2(8.0)	0.490	
No	50(100.0)	48(92.0)		

LGCP.laparoscopic greater curvature plication , LSG.laparoscopic sleeve gastrectomy

Figure 3 Comparison between two study groups in terms of postoperative leak and stenosis. LGCP, laparoscopic greater curvature plication; LSG, laparoscopic sleeve gastrectomy.

All patients underwent a multidisciplinary evaluation (endocrinologist, cardiologist, psychologist, and nutritionist). Blood tests, abdominal ultrasonography, and upper endoscopy or urea breathing test were performed preoperatively to establish a baseline. All surgical procedures were performed under general anesthesia with the patient in anti trendalin burge position and slightly tilt to right . Prophylactic intravenous antibiotics and subcutaneous low molecular weight anticoagulant were administered before induction of anesthesia. Closed pneumoperitoneum was achieved using a four-trocar port technique.

Operative technique of laparoscopic sleeve gastrectomy

Trocar placement was as follows: one 12-mm optical trocar above and slightly to the left of the umbilicus for the 30° laparoscope; one 12 mm on the upper right quadrant for the surgeon's left hand and one 15 mm trocars for the surgeon's right hand were placed 5 cm subcostally in left upper quadrant ; and one 12-mm wound below the xiphoid appendices for surgeon (Figure 4)



Figure 4 site of trochars in abdomen

The procedure began with the dissection of the angle of His, followed by careful dissection of the gastric greater curvature using the LigaSure Vessel Ligation System (Covidien, USA). Starting from the antrum 7 cm from the pylorus toward the left crus of the diaphragm and the angle of His, the omentum and the gastroepiploic vessels were dissected away from the greater curvature, followed by the short gastric vessels, the posterior gastric vein, and the posterior gastric attachments. The left side of the crus was prepared carefully, preserving the fat pad (Figure 5)

Click for operation videos

<https://www.youtube.com/watch?v=nLlw8zsvGnc>

<https://www.youtube.com/watch?v=By5bEr5fMUc>

https://www.youtube.com/watch?v=ha_05nTzw8M

<https://www.youtube.com/watch?v=NSNT1HCg4hc>

<https://www.youtube.com/watch?v=FX8ezaKNjds>



Figure 5 dissection of greater omentum

Then, a 40 Fr bougie was passed into the stomach with its tip positioned in the pylorus. The bougie was used to calibrate the size of the sleeve. The stomach was first transected tangentially from the greater curve toward the lesser curve using a Endo GIA™ stapler 7 cm proximal to the pylorus. Once the bougie was reached, all subsequent stapler firings were cephalad, parallel to the bougie ([Figure 6 and 7](#)), until the angle of His was identified and transected. The specimen was then extracted through the 15-mm port site. Finally, we leak tested the entire staple line using methylene blue. Intra-abdominal drain was inserted and removed 72 h postoperatively; patients were discharged as soon as they could consume a liquid diet and could tolerate pain, provided they were vitally stable, and received a prescription of a daily proton-pump inhibitor for 180 days. During the first 6 postoperative months, all patients were treated with multivitamins.



Figure 6 shape of bouge

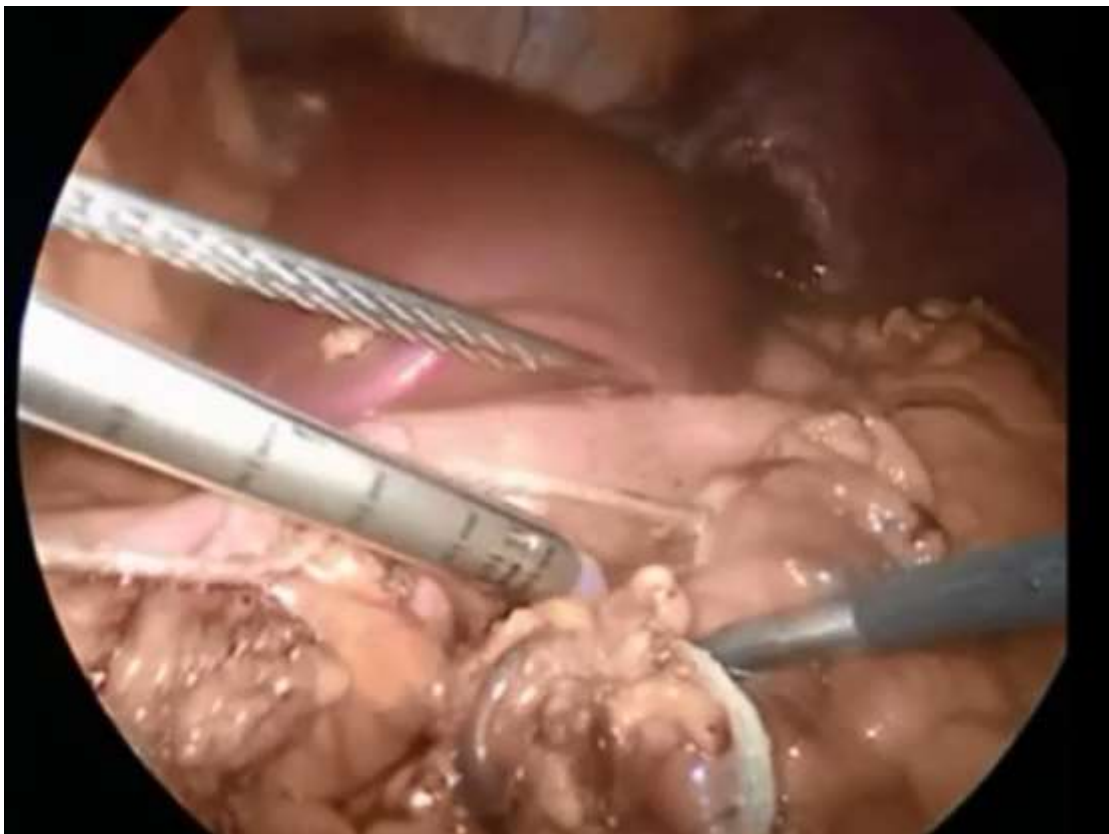


Figure 7 (A) Cutting of stomach barrel to bouge



Figure 7 (B) shape of stomach after cutting barrel to bouge

The postoperative diet was prescribed as follows: a customized liquid diet for 10 days, followed by a progressive return to solid foods in a stepwise manner, with the dietary restrictions removed at 4-6 weeks, depending on patient acceptance. Follow-up visits for the assessment of safety and weight loss were scheduled for first 2 weeks then every 4 weeks in the postoperative period, with assessment of hemoglobin, liver enzymes, serum creatinine, iron, vitamin B₁₂, and calcium blood levels. Upper endoscopy was performed optionally.

Plication surgical procedure

Trocar placement was as follows: one 12-mm optical trocar above and slightly to the left of the umbilicus for the 30° laparoscope; one 12-mm trocar in the right upper quadrant for passing the needle, for suturing, one 12-mm trocar in the left upper quadrant; one 12-mm wound below the xiphoid appendices figure 8 .

Click for operative videos

<https://www.youtube.com/watch?v=NAISjCmE368>

<https://www.youtube.com/watch?v=kbRp9qs-9G0>

<https://www.youtube.com/watch?v=6B18Hta5eG4>



Figure 8 site of trochars insertion (poste operatively)

We followed the same steps for dissection of the greater curve as in sleeve gastrectomy, beginning 3-7 cm proximal to the pylorus till the angle of His. Posterior gastric adhesions were also dissected to allow optimal freedom to create and size the invagination properly. The next step was to initiate gastric plication by invaginating the greater curvature over a 40 Fr bougie and applying a first row of extramucosal continuous stitches of absorbable sutures 3-0 or 2-0 V-LOC (Covidien, USA). This first row guided a subsequent second continuous row created with extramucosal running suture lines by nonabsorbable suture 2-0 nylon round needle. The reduction resulted in a stomach shaped like a large sleeve gastrectomy.

([Figure 9], [Figure 10], [Figure 11]).



Figure 9 First row of extramucosal continuous sutures.

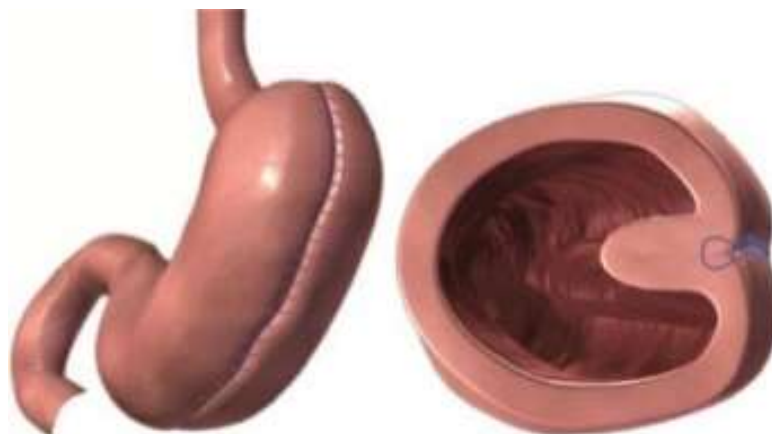


Figure 10 Computerized drawing of the initial fold generated by first initial suture line.

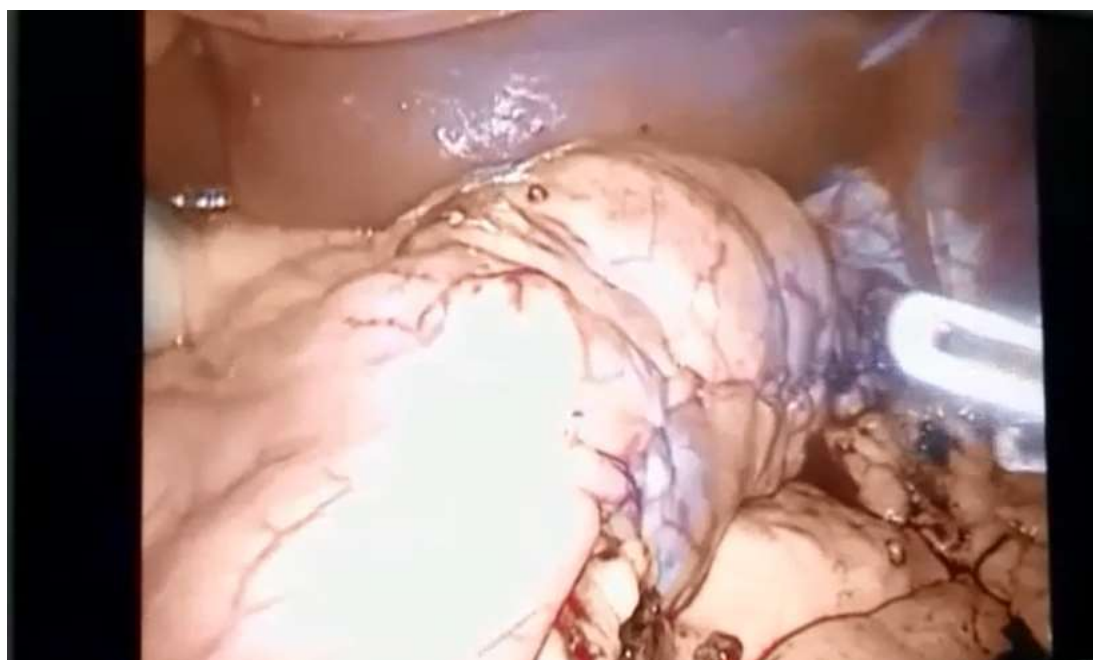


Figure 11 Intraoperative pictures of the final suture line with running nonabsorbable suture.

Leak tests not perform in all cases. No drains were placed. On the first postoperative day, nausea and vomiting, were reported by all patients; these symptoms resolved on treatment with ondansetron and the antispasmodic hyoscine. The rest of the postoperative follow-up protocol was the same as for sleeve gastrectomy.

RESULTS

All procedures were completed laparoscopically. Follow-up was 24 months. There was no statistically significant difference in hospital stay for LSG and for LGCP and the mean length was 36 h (range 24-96 h) for both groups. The mean operative time was 44 min (32-70 min)

for LSG and 48 min (36-68 min) for LGCP. Postoperatively, one patient developed a minor leak after sleeve gastrectomy treated draining Laparoscopically and two patients developed stenosis following gastric plication; the first patient was treated by a second look after 3 months and removal of the second row of stitches at the stenotic area and the second patient presented after one month from the surgery and was treated by endoscopic dilatation (intra-gastric balloon dilatation)

All patients experienced postoperative excess weight loss but the improvement was significantly better for sleeve gastrectomy in terms of the change in BMI (mean 14.45 compared with 10.35 in gastric plication). No weight regain in any patient was recorded until the end of the study

DISCUSSION

LSG is a procedure used initially as the first stage of a definitive bariatric treatment known as the duodenal switch ⁽¹¹⁾. Vertical gastrectomy of the greater curvature is performed, resulting in a tubular stomach with the purpose of restricting food intake. As a primary bariatric procedure, medium-term results have been shown to be adequate (>60% excess weight loss (EWL)), with improvements in comorbidities such as type 2 diabetes mellitus, hypertension, and obstructive sleep apnea in more than 65% of cases ⁽¹²⁾. These promising results are associated with some complications, however, such as esophagitis, stenosis, fistulas, and gastric leaks near the angle of His. These leaks and fistulas are reported in nearly 1% of cases ^{(6),(13)}. LGCP is notably similar to a LSG in that it generates a gastric tube by means of eliminating the greater curvature, but does so without gastric resection. It is likely that LGCP considerably reduces the possibility for gastric leaks. Talebpour and Amoli ⁽¹⁴⁾ reported one case of a gastric leak associated with a more aggressive version of LGCP, which the authors attributed to excessive vomiting in the early postoperative period. In two separate papers, Fusco *et al.* ^{(15),(16)} reported efficacy in gastric plication procedures, as measured by changes in the weight progression of rats. In one paper, Fusco and colleagues reported an increased effect from plication of the greater curvature compared with plication of the anterior surface. These results are in agreement with initial clinical reports by Brethauer *et al.* ⁽¹⁷⁾, who reported increased weight loss in patients receiving LGCP compared with plication of the anterior surface.

In the present study, we also aimed to explore the efficacy of the new LGCP procedure, which has gained more popularity during the last 3 years; the change in BMI after LGCP was 10.35 kg/m² (45.4% EWL) compared with LSG, which was 14.45 kg/m² (66.4% EWL) after 1 year; thus, the result was significantly better with sleeve gastrectomy. There has been no record of weight regain in any patient until the end of the study. The effect of LGCP was inferior and may not be sustained compared with LSG.

CONCLUSION

The present trial shows that LGCP may be a feasible and safe procedure in the short term when used in morbidly obese patients, but is inferior to other restrictive procedures such as LSG. Longer follow-up and prospective comparative trials are needed to clarify whether it can be

used as a stand-alone effective procedure for weight loss and resolution of comorbidities, especially in developing countries.

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