What Should be the Approach When Laparoscopic Sleeve Gastrectomy Fails to Reduce the Weight?

Hamed A. AlWadaani,1* Abdul Qadeer1

ABSTRACT

Laparoscopic sleeve gastrectomy (LSG) is considered to be a better option to reduce the weight due to its simplicity and effectiveness. In some cases, it fails to reduce or the patients regain weight. The revision surgery may be a challenge for a bariatric surgeon due to variety of restrictive as well as malabsorptive surgical procedures available and their complications. The review of literature was conducted on Pubmed to find out the best revision surgical procedure. The valuable suggestions observed were that the laparoscopic revision sleeve gastrectomy (LReSG) is the better option in dilated stomach, while the other procedures of revision may be selected according to the mechanism of failure of the primary surgery.

Key words: Sleeve gastrectomy, Metabolic surgery, Obesity surgery, Roux-en-Y gastric bypass.

INTRODUCTION:

Obesity is a disease associated with many other health disorders like diabetes mellitus, hypertension, heart diseases, infertility, cancer etc. Anti-obesity drugs have not shown significant clinical benefit in patients with body mass index (BMI) more than 40 kg/m².1 Laparoscopic sleeve gastrectomy, due to its simplicity and effectiveness, is considered a better option as primary surgery. Its results are similar to Roux-en-Y gastric bypass (RYGBP) and duodenal switch (DS), without problem of malabsorption.2-5 Some patients after LSG fail to loose weight or regain weight along with insufficient resolution of metabolic disorders.6-10 In these cases revision surgery is required. Moreover, insufficient weight loss or weight regain could be non-representative in the case of super obesity (BMI >50 kg/m²) or super-super obesity (BMI >60 kg/m²).11,12 Inadequate weight loss is considered to be <25% excess weight loss (EWL) defined by Reinhold criteria.13,14 Indications for revision surgery are insufficient weight loss, persistence of co-morbidities, complications after LSG, or relevant side-effects of LSG.15 Revision bariatric surgery following LSG failure and choice of the secondary procedure presents a clinical challenge for bariatric surgeons.16 The revision surgical procedures vary like laparoscopic re-sleeve gastrectomy, DS, RYGBP, bilio-pancreatic diversion (BPD) and others.

METHODOLOGY:

Pubmed database was searched for the articles under the category of meta analysis and systemic reviews from year 2003 to 2014. The search was done between May 2015 to November 2015. MeSH words used for literature search were revisional bariatric surgery, failed sleeve gastrectomy, obesity surgery, Roux-en-Y bypass.

The studies in which patients who failed to reduce or re-gained the weight after sleeve gastrectomy were included. The patients who were not followed up for at least 12 months were excluded. Abstracts and full articles related to obesity surgery were reviewed to find out the most suitable revision procedure after failed LSG. The criterion settled for the failed LSG was insufficient weight loss or weight regain (Reinhold criteria), though this is not the only criterion of failure according to the Bariatric Analysis.

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and Reporting Outcome System (BAROS). Revision procedures were compared with respect to the percent excess weight loss (%EWL) at different postoperative periods ranging from 3 to 24 months depending upon the availability of data.

**DISCUSSION:**
The dilemma of obesity surgeon of failure of primary sleeve gastrectomy is quite obvious from a large variety of procedures available. It is hard to decide which procedure is the best to achieve the goal of weight reduction. Cheung D et al in his online systemic review of literature on revision bariatric surgery included 218 patients of different studies. He showed that the laparoscopic gastric bypass (LGBP) and LReSG, though effective in reducing the weight during initial 12 months, have the tendency to regain at follow-up of 24 months. In their studies, other surgical interventions (OSIs) are more effective than the above two. It showed the urge of finding the other suitable procedure for revision in failure of primary LSG.

In the study conducted by Moszkowicz D et al, patients were converted from sleeve gastrectomy (SG) to mini gastric bypass (MGBP). It showed that malabsorptive procedure was very effective if restrictive procedure like SG failed to reduce the weight. Some authors consider the main advantage of LSG to act as a bridge procedure before laparoscopic DS or a laparoscopic RYGBP. Many patients who failed to loose weight or regain weight developed large stomach or neo-fundus after LSG. In such patients, LReSG is considered as best option. In a study by Giovanni C et al, 11 out of 201 (5.4%) patients required revision after LSG. These patients had post-LSG gastric dilatation in a variable period ranging from 3 to 18 months. The causes of gastric dilatation could be related to a technical problem or to a natural process of stomach tissue dilatation. The antrum may be dilated because it was dissected farther than 6 cm from the pylorus, while fundus may be dilated because it was dissected farther than 1 cm to the left of the esophagus. They underwent LReSG. The %EWL in these patients was 56.3 ± 12.4%, which was quite significant. The advantages of this procedure were to avoid malabsorption and preserve the easy approachable way of diagnostic or operative endoscopy, if required in future. Their strategy is to do LReSG again if the investigations show re-dilatation of the stomach and malabsorptive procedure without its dilatation.

<table>
<thead>
<tr>
<th>Name of Study</th>
<th>Procedure</th>
<th>%EWL at 3 months</th>
<th>%EWL at 6 months</th>
<th>%EWL at 12 months</th>
<th>%EWL at 18 months</th>
<th>%EWL at 24 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheung D et al (n=218)</td>
<td>LGBP*</td>
<td>27</td>
<td>37</td>
<td>60</td>
<td>58</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>LReSG*</td>
<td>50</td>
<td>48</td>
<td>68</td>
<td>48</td>
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</tr>
<tr>
<td></td>
<td>OSI*</td>
<td>NA</td>
<td>NA</td>
<td>65</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Moszkowicz D et al (n=19)</td>
<td>LMGBP-OL*</td>
<td>26.8±12</td>
<td>37.2±12.4</td>
<td>49.3±19.8</td>
<td>48.6±21</td>
<td>51.6±14.8</td>
</tr>
<tr>
<td>Giovanni C et al (n=11)</td>
<td>LReSG*</td>
<td>NA</td>
<td>NA</td>
<td>56.8±12.4</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Rebibo et al (n=15)</td>
<td>LReSG*</td>
<td>NA</td>
<td>NA</td>
<td>29.1</td>
<td>NA</td>
<td>NA</td>
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<tr>
<td>Gautier T et al (n=9)</td>
<td>RYGBP*</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
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<td>NA</td>
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<tr>
<td>Langer FB et al (n=5)</td>
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<td>NA</td>
<td>63</td>
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<td>NA</td>
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<tr>
<td>Carmeli I et al (n=19)</td>
<td>BPD-DS*</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>80±40 65.5±34</td>
</tr>
<tr>
<td></td>
<td>RYGBP*</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
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</tbody>
</table>

**Key:** LGBP = Laparoscopic gastric bypass, LReSG = Laparoscopic re-sleeve gastrectomy RYGBP = Roux-en-Y gastric bypass, LMGBP-OL = Laparoscopic mini-gastric bypass-Omega loop, BPD-DS = Bilio-pancreatic diversion-Duodenal switch, OSI = other surgical interventions which include BPD-DS or Butterfly gastroplasty, %EBL = Percent Excess BMI loss.
Deguines JB et al have considered failure of LSG by measuring residual gastric volume (RGV) using gastric computed tomography volumetry (GCTV) after a period of 34 months. They have suggested LReSG when the RGV is >250 ml. Gautier T et al converted 18 patients from SG to RYGBP, out of which, 9 were due to insufficient weight loss. Their %EWL changed from 47.1% to 64.6%. Experience of Rebibo L et al of ReSG is different from others. Their study of 15 patients who underwent ReSG did not show difference in respect to the %EWL, rather little opposite, while ReSG patients resulted in more postoperative morbidity and mortality rate. His study showed EWL in ReSG equal to 66%, while first-line LSG showed that equal to 77% at 12 months follow-up. Weiner RA et al concluded in his study after revision surgery in 88 failed cases of LSG that the malabsorptive procedures like DS and Omega-loop gastric bypass were more efficient second stage procedures than ReSG or RYGBP. Zundel N and his colleague Hernandez JD suggest in their study that the restrictive procedures like laparoscopic adjustable gastric banding (LAGB), LSG and vertical banded gastroplasty (VBG) are effective procedures but less than malabsorptive or combined procedures.

Langer FB et al found RYGBP as an effective procedure of conversion to address the problem of weight regain after LSG. Carmeli I et al suggested in their study that the selection of the revision procedure should be based on understanding the mechanism of failure. In their study, nine patients were converted from LSG to DS and ten to RYGBP. They had 28±16.5% EWL at the time of re-operation. After DS, it reached to 80±40%, while after RYGBP it reached to 65.5±34% (table I).

CONCLUSIONS:
From the review of the above literature, a great diversity of the opinion found for revision procedure after failed sleeve gastrectomy. The valuable suggestions observed were that LReSG should be opted if there is dilatation of the stomach. Secondly, the mechanism of failure should be understood before selecting the procedure of revision.

REFERENCES:


Author’s Contributions:
Hamed A Al Wadaani: Analyzed, edited, reviewed and finally approved the manuscript
Abdul Qadeer: Searched and collected the data, analyzed and wrote the manuscript

Conflict of Interest:
The authors declare that they have no conflict of interest.

Source of Funding:
None

How to cite this article:
AlWadaani HA, Qadeer A. What should be the approach when laparoscopic sleeve gastrectomy fails to reduce the weight? J Surg Pakistan. 2016;21(1)39-43. Doi:http://dx.doi.org/10.21699/jsp.21.1.10