

REVIEW

Correlation of weight loss with residual gastric volume on computerized tomography in patients undergoing sleeve gastrectomy: A systematic review

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Summary

Laparoscopic Sleeve gastrectomy (LSG) is the most commonly performed bariatric surgical procedure worldwide. There is wide variation however in post-operative weight loss on long term follow-up, and residual gastric volume (RGV) is believed to be an important variable. Multiple studies have correlated RGV as assessed by Computerized Tomography volumetry with excess weight loss (EWL%) following LSG, but definite consensus is lacking. This article systematically reviews the published studies in English literature to ascertain whether any correlation exists between the RGV and EWL% following LSG. Ten studies were included in this review, and significant differences were noted in the technique of RGV assessment, and timing of RGV and EWL % assessment. Five studies found a statistically significant correlation between the RGV and EWL%. One study found a correlation which did not reach statistical significance. Two additional studies reported that the resected volume rather than RGV correlated with the EWL%. Meta-analysis of studies reporting correlation between RGV and EWL% showed that up to 26.3% (95% CI: 5.1%-56.1%) of variability in EWL% can be explained by variations in RGV. A lower RGV is likely to result in a better post-operative weight loss following LSG. There is need for standardization of technique and timing of RGV assessment.

KEYWORDS

bariatric surgery, CT volumetry, LSG, residual gastric volume, RGV, sleeve gastrectomy, weight loss

1 | INTRODUCTION

Laparoscopic Sleeve Gastrectomy (LSG) has become the most commonly performed bariatric procedure worldwide. According to the fifth International Federation for the Surgery of Obesity and metabolic disorders (IFSO) 2019 report, 305 242 LSG procedures were performed during 2015-2018,¹ accounting for 58.6% of all bariatric procedures. Studies with long term follow-up have reported an excess weight loss varying from 40% to 57%.²⁻⁴ Inadequate weight loss and weight regain following LSG remains a concern especially with the

high number of surgeries being performed. Rate of weight regain after LSG ranges from 14% to 37% in the long term⁵ and can cause significant concern, even though the weight rarely reaches preoperative values. This can lead to a requirement for revisional surgery after LSG in 11.8% of the patients over a 5-year follow-up period.⁶

LSG however still remains a popular procedure as apart from being a restrictive procedure, it also results in decreased levels of Ghrelin, increased levels of GLP-1 (Glucagon like peptide-1), and faster gastric emptying, contributing to weight loss and an improvement in metabolic profile.⁷ The residual sleeve volume and the size of