

INPLASY

Comparing the effects of laparoscopic Roux-en-Y gastric bypass versus laparoscopic sleeve gastrectomy on weight loss: a systematic review and meta-analysis

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ADMINISTRATIVE INFORMATION

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Review Stage at time of this submission - Preliminary searches.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 16 March 2024 and was last updated on 16 March 2024.

INTRODUCTION

Review question / Objective This systematic review establishes a comparison between LRYGB and LSG outcomes in weight loss, resolution of comorbidities, and occurrence of adverse events at various follow-up intervals, considering the variations observed in recent RCTs.

Condition being studied Laparoscopic Sleeve Gastrectomy (LSG) and Laparoscopic Roux-en-Y gastric bypass (LRYGB) are the most common bariatric modalities. There is ongoing debate on the two modalities' long-term effects on weight loss and comorbidity resolution. Currently, LSG is the one with the most frequency in practice, whereas LRYGB is still under considerable investigation. Due to its history of successful weight reduction and comorbidity remission, LRYGB remains the gold standard in bariatric surgery. Nevertheless, LSG has become increasingly popular, being effective for reducing

body weight and achieving comorbidity remissions, technical simplicity, and lower rates of complications. Although short-term studies show that LSG is more effective for weight reduction and resolving comorbidities, the medium and long-term results of both operations are yet unknown. Furthermore, some individuals who have had LSG may need revisional surgery because of insufficient weight reduction or weight recovery. Some randomized controlled trials (RCTs) examined LRYGB and LSG impacts on weight reduction and comorbidity resolution, but they lack long-term follow-up and have inadequate sample sizes.

METHODS

Participant or population We combed through EMBase, PubMed, and the Cochrane Central Register of Controlled Trials (CENTRAL) until September 2023 from inception. (1) All participants were adults over the age of 18, (2) Patients met the bariatric surgery requirements, (BMI >40 kg/m², >30 kg/m² with associated comorbidities).

Intervention Laparoscopic Roux-en-Y gastric bypass(LRYGB).

Comparator Laparoscopic Sleeve Gastrectomy (LSG).

Study designs to be included Randomized controlled trials (RCTs).

Eligibility criteria The American Diabetes Association defines remission of T2DM as follows: a glycosylated hemoglobin(HbA1c)level of less than 42 mmol/mol (6.0%), a fasting glucose level of less than 5.6 mmol/L (100 mg/dL), and a period of at least one year without active medication or continuing treatments.

Information sources We combed through EMBase, PubMed, and the Cochrane Central Register of Controlled Trials (CENTRAL) until September 2023 from inception. All included datasets were in English and published.

Search Strategy:In September 2023,a comprehensive electronic literature search was performed on PubMed, EMBase, and the Cochrane Central Register of Controlled Trials (CENTRAL) database.On Pubmed, the following search was carried out:(("gastric bypass"[MeSH Terms] OR ("gastric"[All Fields] AND "bypass"[All Fields]) OR "gastric bypass"[All Fields] OR "roux en y gastric bypass"[All Fields]) AND (("sleeve"[All Fields] OR "sleeved"[All Fields] OR "sleeves"[All Fields] OR "sleeving"[All Fields]) AND ("gastrectomy"[MeSH Terms] OR "gastrectomy"[All Fields] OR "gastrectomies"[All Fields])) AND ("randomized controlled trial"[Publication Type] OR "randomized controlled trials as topic"[MeSH Terms] OR "randomized controlled trial"[All Fields] OR "randomised controlled trial"[All Fields])) AND (randomizedcontrolledtrial[Filter]).On EMBase the following search was carried out:(('roux-en-y gastric bypass'/exp OR 'roux-en-y gastric bypass' OR ('roux en y' AND gastric AND ('bypass'/exp OR bypass))) AND ('sleeve gastrectomy'/exp OR 'sleeve gastrectomy' OR (sleeve AND ('gastrectomy'/exp OR gastrectomy))) AND ('randomized controlled trial'/exp OR 'randomized controlled trial' OR (randomized AND controlled AND ('trial'/exp OR trial))).On Cochrane Library,an search Title Abstract Keyword was conducted for:Roux-en-Y gastric bypass AND sleeve gastrectomy AND Randomized Controlled Trial.

Main outcome(s) Weight loss outcomes (postoperative BMI, %EWL, %TWL), and remission of the comorbidities (T2DM, hypertension, dyslipidemia, and obstructive sleep apnea syndrome) were synthesized from the included

datasets. The incidence of adverse events that occurred after the operation was also documented. Surgical problems include leakage, infection, ileus, bleeding, internal hernia, gastrojejunal stenosis, and dumping syndrome are among the adverse events. Nonsurgical symptoms such as gastroesophageal reflux and dumping syndrome were also considered.

Quality assessment / Risk of bias analysis Each investigation's quality was separately reviewed via 2 authors (Li-Bin Huang and Qiu-Shi Huang) utilizing the RoB 2.0 Assessment Form (by the Cochrane Collaboration). Different domains were deemed to be of high, low, or moderate bias concerns, including the possibility of selection bias, randomization process, intervention variations, reported result selection, outcome measurement, missing outcome data, and overall bias. After consulting with or discussing with the third reviewer (Rui Zhao), any disagreements were eventually addressed.

Strategy of data synthesis A significant result was defined as a P value <0.05, and Review manager 5.3 executed all analyses. The risk ratio (RR) and mean difference (MD) were calculated for dichotomous and continuous outcomes, respectively. To corroborate the impact calculation and create pooled effect estimates, we then used the respective 95% confidence intervals (CI).

Subgroup analysis Weight loss and comorbidities were analyzed in subgroups according to follow-up time points 1, 2, 3, 5, and 7 years following surgery. Adverse events were grouped as early (≤ 30 days).

Sensitivity analysis The I² statistic and Q test were employed for evaluating heterogeneity^{25,26}.When the I² value was > 50%, we thought that there was remarkable heterogeneity. Whenever the I² value was > 50%, the random-effects model (DerSimonian and Laird method) was utilized, and if it was less than 50%, we utilized the fixed-effects model (Mantel-Haenszel method).

Country(ies) involved China (Division of Gastrointestinal Surgery, Department of General Surgery, West China Hospital).

Keywords bariatric surgery, laparoscopic Roux-en-Y gastric bypass, laparoscopic sleeve gastrectomy, weight loss, comorbidity resolution.

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