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Is laparoscopic sleeve gastrectomy a lower risk bariatric procedure compared with laparoscopic Roux-en-Y gastric bypass? A meta-analysis



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Abstract

BACKGROUND: Laparoscopic Roux-en-Y gastric bypass (LRYGB) is the current “gold standard” bariatric procedure in the United States. Laparoscopic sleeve gastrectomy (LSG) has recently become a commonly performed procedure for many reasons, including patients’ perception that LSG has less complexity and invasiveness, and lower risk. Our objective was to review the literature and compare the leak rates, morbidity, and mortality for LRYGB versus LSG.

METHODS: Publications from 2002 to 2012 with *n* greater than or equal to 25 and postoperative leak rate reported were included. Statistical analysis included chi-square according to patient number.

RESULTS: Twenty-eight (10,906 patients) LRYGB and 33 (4,816 patients) LSG articles were evaluated. Leak rates after LRYGB versus LSG were 1.9% (*n* = 206) versus 2.3% (*n* = 110), respectively (*P* = .077). Mortality rates were .4% (27/7,117) for LRYGB and .2% (7/3,594) for LSG (*P* = .110). Timing from surgery to leak ranged from 1 to 12 days for LRYGB versus 1 to 35 days for LSG.

CONCLUSIONS: Leak and mortality rates after LRYGB and LSG were comparable. The appropriate procedure should be tailored based on patient factors, comorbidities, patient and surgeon comfort level, surgeon experience, and institutional outcomes.

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Current data are now showing that more than one third of the population in the United States is obese, with over half the population being considered overweight. This trend has continued to rise; currently, 17% (12.5 million) of children and adolescents (2 to 19 years old) are considered

obese. In 2008, an estimated 147 billion was spent on obesity-related medical costs.¹ Despite the significant resources spent on obesity and its associated medical conditions, the epidemic continues. In 1991, the National Institute of Health Consensus Conference Statement stated that “Only surgery has proven effective over the long-term for most patients with clinically severe obesity”.² Several medical associations have echoed this sentiment (American Medical Association, American Academy of Family Physicians, The National Institute of Diabetes and Digestive and Kidney Diseases). Multiple reports have now shown

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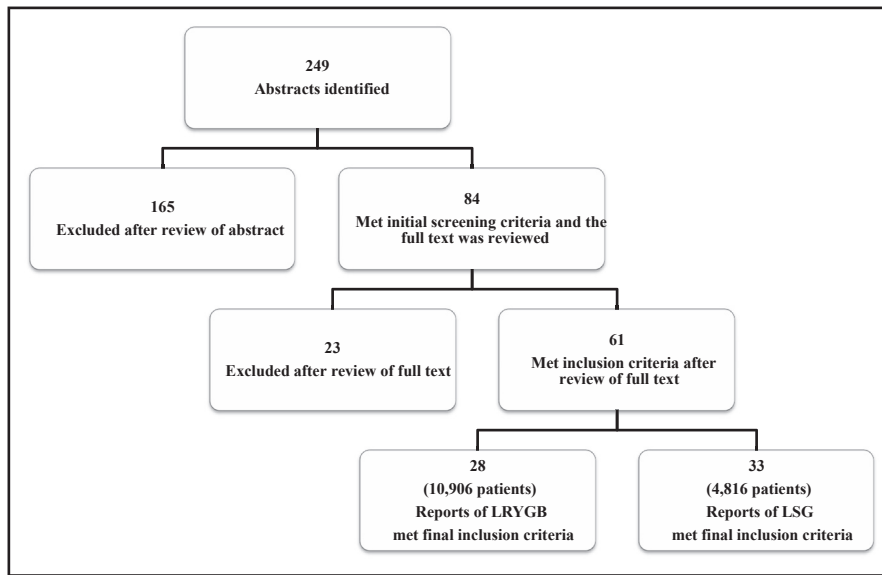


Figure 1 Publication inclusion.

significant improvements in obesity-related comorbidities after bariatric surgery.³ With this continued epidemic and no other intervention proven as effective, bariatric surgery has become one of the most common surgical procedures performed in the United States.^{3–6} Laparoscopic Roux-en-Y gastric bypass (LRYGB) is the “gold standard” bariatric procedure in the United States, although laparoscopic sleeve gastrectomy (LSG) has recently become a more commonly performed procedure for a variety of reasons, including the perceived notion among patients that LSG is associated with less complexity, lower risk, and less invasiveness.

LRYGB has traditionally been thought of as both a restrictive and malabsorptive procedure, although recent investigations have shown that weight loss after LRYGB is related to a complex relationship among the gastrointestinal tract, brain, and specialized gastrointestinal hormones.¹ LRYGB involves reconstruction of the normal intestinal anatomy. It was first described in 1964 by Dr Mason, and laparoscopically in 1994 by Dr Wittgrove, and has since become one of the most common, well-studied procedures for weight loss.^{7,8} LRYGB involves intestinal reconstruction and 2 anastomoses. This procedure can be more

technically demanding and require more experience than other techniques. It has been repeatedly shown to result in sustained weight loss with low associated complication rates. Some advantages are that LRYGB is widely available, and data have illustrated significant improvement and resolution of comorbidities with sustained weight loss. Disadvantages and complications include anastomotic leaks, ulcers, stenosis, vitamin malabsorption, internal hernias, and small bowel obstructions.

LSG was first performed in 1999 by Dr Gagner as the first step in the duodenal switch procedure in the super obese.⁹ In this patient population, because of the inherent complexity of the duodenal switch operation, the sleeve gastrectomy (initially a peptic ulcer procedure) was performed with plans for completion of the second stage at a later date. It was unexpectedly noted that these patients had excellent weight loss results without completion of the duodenal switch.¹⁰ The LSG was then utilized as a standalone procedure for weight loss.

LSG involves a stapled gastroplasty with preservation of normal anatomy but permanent removal of a large portion of the stomach. It has traditionally been thought of as a purely restrictive procedure but, similar to LRYGB, has also recently been shown to result in a complex interplay between many gastrointestinal hormones.³ Early studies have shown promising results regarding weight loss and resolution of comorbidities but a wide range of complication rates.^{4–6,10,11} Advantages of LSG include that it is technically easier, without the need to perform an anastomosis, results in less need for supplementation, and there is no risk of marginal ulcers or internal hernias. There are several potential complications and disadvantages associated with LSG, including leaks, fistulas, strictures, increased nausea and vomiting, slower progression of diet, worsening of gastroesophageal reflux, irreversibility, and relative lack of long-term data.

Table 1 Perioperative characteristics

Variable	Overall	LRYGB	LSG
Length of stay (days)	3.0	2.8	3.3
Operative time (minutes)	120.1	136.0	90.2
Conversion to open, n (%) [*]	74/5,703 (1.3)	62/4,026 (1.5)	12/1,677 (.7)

LRYGB = laparoscopic Roux-en-Y gastric bypass; LSG = laparoscopic sleeve gastrectomy.

^{*}P = .012 for LRYGB vs LSG.

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