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SURGERY FOR OBESITY AND RELATED DISEASES

Surgery for Obesity and Related Diseases 11 (2015) 248–258

Review article

Single-incision laparoscopic bariatric surgery: a systematic review

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Received August 17, 2013; accepted November 27, 2013

Abstract

Background: Single-incision laparoscopic surgery has sparked a great deal of interest in the surgical community in recent years, including bariatric surgery. However, we still do not definitively know if this type of surgical approach provides benefits over conventional techniques without increasing morbidity and mortality.

Objective: To evaluate the safety and efficacy of single-incision laparoscopic bariatric surgery (SILBS) compared with conventional laparoscopic bariatric surgery (CLBS).

Materials and Methods: We searched the most important databases. Randomized clinical trials and observational studies comparing SILBS with CLBS were included. This systematic review was performed in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses recommendations.

Results: Fourteen studies complied with the inclusion criteria for our analysis, which included 2357 patients (1179 SILBS group versus 1178 CLBS group). The duration of surgery was longer in the SILBS group and no major intraoperative complications were observed in these series. A small improvement in postoperative pain was indicated in the SILBS group. The overall morbidity rate was 5% in the SILBS group and 4.8% in the CLBS. There was 1 perioperative death in 1 study, which occurred in an adjustable gastric banding (AGB) group, at .1% of all cases of AGB and .005% of all SILBS cases. When cosmesis was evaluated, patients in the SILBS group were more satisfied with the scar outcome.

Conclusion: SILBS is a feasible technique to use in selected patients. However, there is insufficient evidence to recommend its widespread use compared with a conventional approach. More studies are needed to analyze the safety of this technique and its possible benefits. (Surg Obes Relat Dis 2015;11:248–258.)

Keywords: Single-incision adjustable gastric banding; Single-incision sleeve gastrectomy; Single-incision; Roux-en-Y gastric bypass; Single-incision bariatric surgery; Systematic; review

The expansion of new minimally invasive surgical (MIS) techniques and technologies in recent years has been based on achieving one of the primary "ideal" goals of modern surgery: surgery without visible scars. Surgery involving zero or minimal trauma to the abdominal wall would, at least in theory, imply all the advantages of MIS. In this context, natural orifice transluminal endoscopic surgery could be considered as a paradigm of this type of development, although despite proven feasibility, its widespread implementation has been limited by a lack of development [1]. However, the innovation resulting from research into natural orifice transluminal endoscopic surgery techniques has allowed for the development of current surgical techniques geared toward the concept of reducing access

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1550-7289/14/$ – see front matter
http://dx.doi.org/10.1016/j.soard.2013.11.013

surgery. A series of bridge technologies have facilitated this development under high standards of safety and efficacy, with single-incision laparoscopic surgery (SILS) being the most attractive of the techniques currently available. SILS has been used for various abdominal procedures including cholecystectomy [2], appendectomy [3], and colectomy [4,5] and recently this technique has also been applied to bariatric surgery [6].

In an attempt to improve the results of bariatric surgery, a number of single-incision laparoscopic bariatric surgery (SILBS) procedures have been developed, including adjustable gastric banding (AGB), sleeve gastrectomy (SG), and Roux-en-Y gastric bypass (RYGB) [7].

The objective of this review was to evaluate the feasibility and safety of SILBS and compare its potential advantages with conventional laparoscopic bariatric surgery (CLBS).

Materials and Methods

This systematic review was conducted in accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analyses recommendations [8].

Search parameters

We took into account all studies published between 1985 and February 2013, with no limitations based on the language of publication. The standard major medical databases were accessed: Embase, PubMed, and Cochrane Central Register of Controlled Trials. In our searches, we used the MeSH "bariatric surgery," the word roots "endoscop*," "laparoscop*," and "laparoendoscop*," and the keywords "single incision," "single site," "single port," "single access," "single trocar," "one trocar," "one port," "one wound," "transumbilical," "embryonic," and "embryologic."

Study selection and data collection

Randomized controlled trials (RCTs) and observational studies comparing SILBS with CLBS were included. We also reviewed the reference lists of these articles to find additional information. Duplicated publications and review articles were excluded. The results from each study were transferred into our data set by 2 independent reviewers (A. M-R., C. S-V.), and a third reviewer (C.M-S.) collaborated for a final decision in the case of any discrepancies.

We assessed the methodologic quality of all included studies according to the Cochrane methodology for RCTs and the Newcastle-Otawa Quality Assessment Scale for observational studies [9,10].

The primary objective of our analysis was to evaluate feasibility and safety of SILBS and to compare its potential benefits over CLBS.

Results

We identified a total of 262 studies for review based on title and abstract. After excluding duplicated articles and those that did not comply with the inclusion criteria, we obtained a total of 20 studies that were reviewed in depth. Finally, 4 studies did not contain a control group and 2 were review articles, all of which were excluded. The flow chart of this selection process is summarized in Fig. 1. Fourteen studies with a total of 2357 patients, 1179 in the SILBS group and 1178 in the CLBS group, were included for qualitative synthesis [11–24]. These included 13 cohort studies [11–19,21–24] and 1 RCT [20] (Table 1).

Quality of studies

The general characteristics of the studies are summarized in Table 1. There was only 1 RCT, published by Lakdawala et al. [20], a preliminary study comparing 50 single-incision and 50 conventional SGs. This study had no adequate

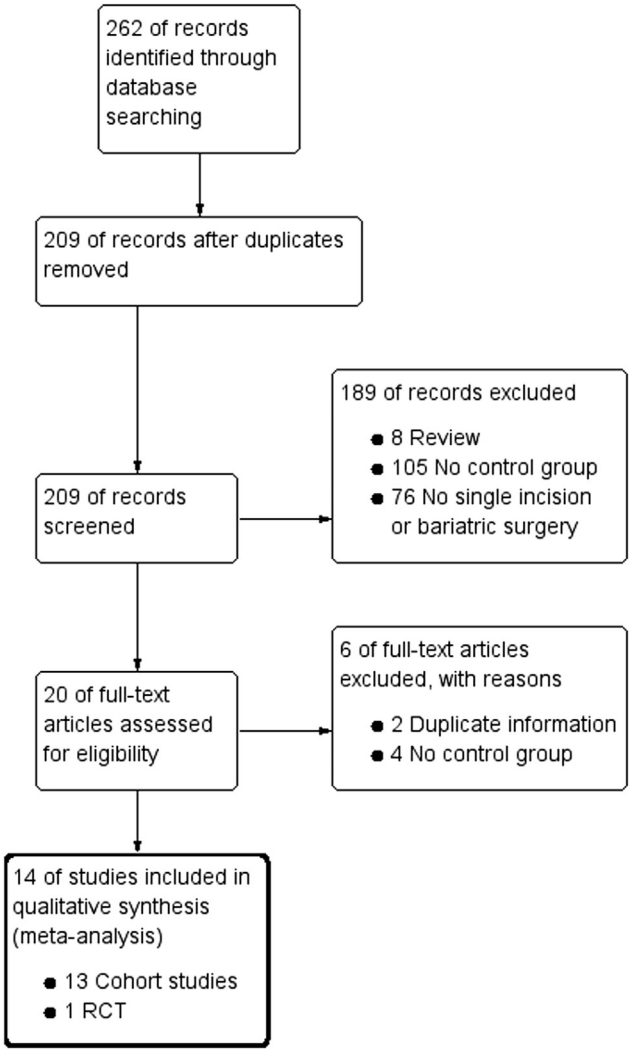

Fig. 1. Study flow chart.