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Review

Hand-assisted laparoscopic surgery versus open surgery for colorectal disease: a systematic review and meta-analysis

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Hand-assisted laparoscopic surgery;
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Meta-analysis

Abstract

BACKGROUND: Laparoscopic colorectal surgery remains one of the most challenging techniques to learn.

METHODS: The authors collected studies that have compared hand-assisted laparoscopic surgery (HALS) and open surgery for the treatment of colorectal disease over the past 17 years. Data of interest for HALS and open surgery were subjected to meta-analysis.

RESULTS: Twelve studies that included 1,362 patients were studied. In total, 2.66% of HALS procedures were converted to laparotomy. Compared with the open surgery group, blood loss, rate of wound infection, and ileus in the HALS group decreased, and incision length, recovery of gastrointestinal function, and hospitalization period were shorter. There were no significant differences in operating time, hospitalization costs, mortality, and complications, including urinary tract infection, pneumonia, and anastomotic leak, between the groups.

CONCLUSIONS: HALS has the advantages of minimal invasion, lower blood loss, shorter incision length, and faster recovery, and it can shorten the length of hospitalization without an increase in costs. The drawbacks are that a small number of patients who undergo HALS may need to be converted to laparotomy, and the oncologic safety and long-term prognosis are not clear.

Laparoscopic colorectal surgery was first described in 1991.[1] Because of its advantages of minimal invasion, faster postoperative recovery, and shorter hospital stays, it has been widely applied to colorectal surgery over the past decade.[2] But with its wide implementation, most surgeons have realized that laparoscopic colorectal surgery is one of the most challenging techniques to learn; it has been estimated that 20 to 62 laparoscopic colectomy cases are needed to achieve proficiency with laparoscopic techniques.[3–6] The reasons for this steep learning curve include difficulty in exposing the colon and a lack of tactile feedback.[7,8]

Hand-assisted laparoscopic surgery (HALS) is a hybrid laparoscopic approach by which the surgeon inserts a hand

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inside the abdomen to facilitate the laparoscopic dissection without disturbing the pneumoperitoneum.[9] The potential advantages of HALS include the restoration of tactile feedback and proprioception, the ability to perform blunt dissection, rapid control of unexpected bleeding, and a potential reduction in the number of trocars and instruments required to perform the resection.[10] HALS has been introduced as an alternative surgical technique, essentially bridging both open and laparoscopic approaches,[11,12] and may be a better option for surgeons early in their laparoscopic careers.[13] But whether intra-abdominal placement of a hand during HALS abrogates the benefits of minimally invasive techniques remains to be established. A study by Aalbers et al[14] showed a significant shorter time to flatus and length of hospital stay after HALS than after open surgery (OS), and the number of harvest lymph nodes, postoperative complications, mortality rates, and hospitalization costs were similar between the 2 groups. Therefore, they concluded that HALS has the advantages of laparoscopic surgery over OS, especially for indications in which an incision to extract the resection specimen is required.

Unfortunately, only 7 studies with a small number of cases were included in their study, and no subcategory analysis of complications was performed,[14] making objective evaluation of the safety of HALS difficult. More important, the included studies contained benign and malignant disease, colon and rectal surgery, and randomized controlled trials and nonrandomized controlled trials. Therefore, sensitivity analysis should be performed to evaluate the stability of the results, and a meta-analysis of more studies with a larger sample size and objective appraisal of complications is necessary. To that end, we collected all studies published since 1995 that compared HALS with OS for the treatment of colorectal disease to perform a meta-analysis and investigated the value of HALS for treatment of colorectal disease.

Methods

Search strategy

The publications were identified by searching the major medical databases, such as MEDLINE, EMBASE, and the Cochrane Library, for relevant reports published between January 1995 and May 2012. The search string was as follows: "(hand OR hand-assisted OR hand-assisted laparoscopic OR manual OR manually) AND (colon OR colorectal OR sigmoid OR rectal OR rectum OR colectomy OR hemicolectomy OR proctectomy)."

Inclusion and exclusion criteria

Inclusion criteria were (1) comparison of HALS with OS for treatment of colorectal disease between 1995 and 2012; (2) inclusion of patients with primary colorectal disease; and (3) presence of raw data including most of the following: conversion rate, operative time, blood loss, incision length, number of harvested lymph nodes, time to first flatus, length of hospital stay, complications, mortality, and hospitalization costs. Exclusion criteria were (1) no OS group as a control; (2) nonprimary colorectal diseases; and (3) duplicate publication or provision of insufficient data.

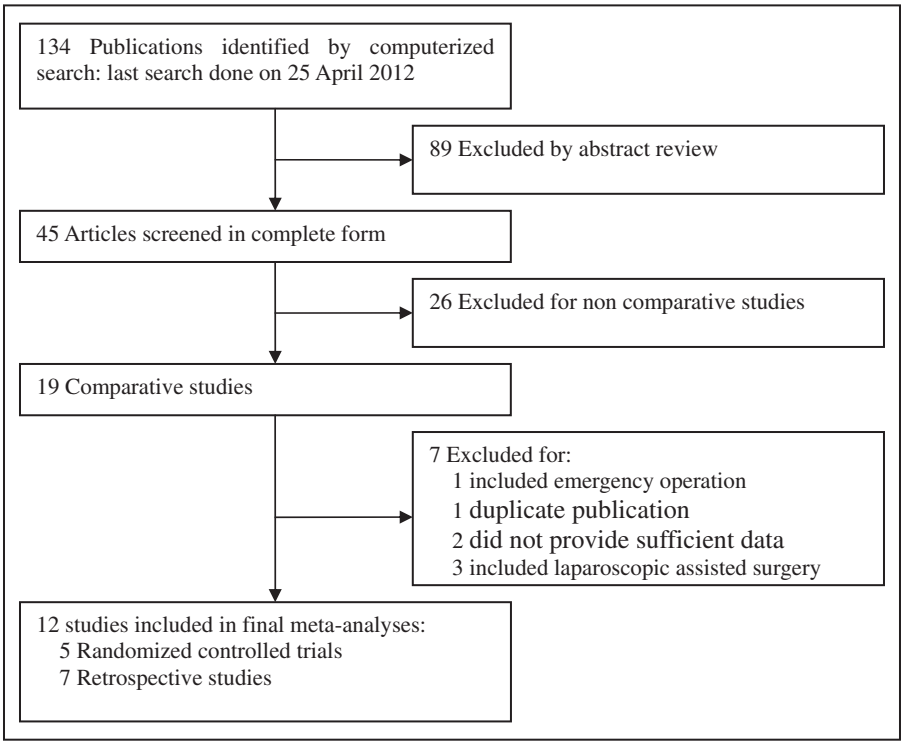

Figure 1 Systematic search and selection strategy.