Short-term outcomes after laparoscopic ileocolic resection for Crohn's disease: a systematic review

Polle S W, Wind J, Ubbink D T, Hommes D W, Gouma D J, Bemelman W A

CRD summary
This review concluded that laparoscopy versus open resection for ileocolic Crohn's disease carries longer operating times and shorter hospital stays but comparable morbidity rates. Overall, the authors' conclusions should be interpreted with caution given the lack of evidence regarding a number of important outcomes and the methodological flaws and differences between the studies.

Authors' objectives
To compare the efficacy of laparoscopic ileocolic resection and conventional open surgery in patients with Crohn's disease (CD).

Searching
MEDLINE, EMBASE and the Cochrane Library were searched, without language restrictions, from January 1991 to February 2006; the search terms were reported. The bibliographies of retrieved articles were checked for additional studies.

Study selection
Study designs of evaluations included in the review
Eligible studies were randomised controlled trials (RCTs), controlled clinical trials and comparative studies.

Specific interventions included in the review
Studies comparing laparoscopic or laparoscopic-assisted ileocolic resection with conventional open resection for ileocolic CD were eligible for inclusion. Synchronous procedures at the time of the ileocolic resection, such as additional stricturoplasty or additional segmental small bowel resection, were permitted.

Participants included in the review
Studies of patients with CD undergoing ileocolic resection were eligible. Studies including patients with an indication for segmental colonic resections for CD were excluded. Some of the included trials recruited patients who had a segmental small bowel resection, but the majority of cases were undergoing ileocolic resections. Studies of patients with only recurrent CD were excluded. Two of the included studies focused primarily on adolescent and paediatric patients.

Outcomes assessed in the review
The primary outcomes were operating time, conversions to open surgery, post-operative complications requiring reoperation, overall morbidity and hospital stay. The secondary outcomes were estimated blood loss, time to recovery of gut function, and time to first flatus or first bowel movement.

How were decisions on the relevance of primary studies made?
Two independent reviewers assessed the relevance of the studies; any disagreements were resolved through discussion.

Assessment of study quality
Two independent reviewers assessed study quality with respect to the following: randomisation; patients blinded for treatment; comparability of the study groups at baseline; length of follow-up; intention-to-treat analysis; consecutive inclusion of the patients; prospective data collection for the laparoscopic group; and the collection of data during the same time period for both study groups. A quality score was assigned to each study, with the highest quality studies scoring a maximum of 24 points. Poor-quality studies were excluded from the meta-analysis.
Data extraction
Two independent reviewers extracted the data using standardised forms. Weighted mean differences and risk differences (RDs), along with their 95% confidence intervals (CIs), were calculated.

Methods of synthesis
How were the studies combined?
The studies were grouped and pooled effect sizes (with 95% CIs) calculated using a fixed-effect model, (I-squared <25%), or a random-effects model if significant statistical heterogeneity (I-squared <75%) was detected. Where I-squared was greater than 75%, the data were not pooled.

How were differences between studies investigated?
Statistical heterogeneity was assessed using the chi-squared and I-squared statistics. Separate analyses were carried out for RCTs.

Results of the review
Fourteen studies (n=729) were evaluated in the review: 2 RCTs, 10 controlled clinical studies and 2 case-matched studies.

Twelve studies were judged to be of fair to good quality: the total quality scores ranged from 7 to 18. None of the studies was blinded for outcome assessors. Two studies scored only 1 point and were not considered in the analysis.

Operating times were longer for laparoscopy in 9 of the 12 studies and shorter in 3 studies. Actual operating times varied across the studies, ranging from a reduction of 23 minutes to an increase of 80 minutes in the laparoscopy group. There was evidence of significant statistical heterogeneity (p<0.05; I-squared 91.2%) for this outcome, therefore statistical pooling was not carried out. Estimated blood loss was higher for laparoscopy in 2 studies and lower in another 2 trials. The rate of conversion from laparoscopy to open surgery ranged from 0 to 16.7%.

The number of complications requiring reoperation was comparable for laparoscopy and control groups, as was overall morbidity. However, a subgroup analysis limited to RCTs showed a lower morbidity in patients treated with laparoscopy (RD -0.21, 95% CI: -0.36, -0.06). The laparoscopic approach was associated with an earlier return to normal gut function, a shorter time to a normal diet (1.12 days, 95% CI: 0.64, 1.61; 4 studies) and a shorter hospital stay (1.9 days, 95% CI: 0.83, 2.97; 5 studies). However, this latter outcome was associated with significant statistical heterogeneity (p=0.006; I-squared 72.0%).

Cost information
The authors stated that laparoscopy seemed to be associated with significantly lower costs but did not provide further details.

Authors’ conclusions
There is evidence that laparoscopic ileocolic resection for CD is associated with shorter hospital stay in comparison with open ileocolic resection, while morbidity rates are similar and conversion rates acceptable.

CRD commentary
This review addressed a well-defined question in terms of the participants, interventions, outcomes and study design. Two relevant databases and one trials register were searched and efforts were made to find further information by reviewing reference lists. The potential influence of publication bias was not considered in the report. No language restrictions were applied, thereby limiting the potential for language bias. The authors attempted to minimise bias and errors by carrying out crucial review phases in duplicate. A comprehensive assessment of study quality was carried out and the majority of the studies were judged to be of fair to good quality. However, methodological flaws were still present in a number of the studies and these were considered in the authors’ interpretation of the data.
Statistical heterogeneity was assessed and found to be present for one of the main outcomes. Randomised trials were combined with non-randomised trials and this may affect the reliability of the analyses, as the authors acknowledged. Overall, the authors’ conclusions should be interpreted with caution given the lack of evidence regarding a number of important outcomes and the methodological flaws and differences between the studies.

**Implications of the review for practice and research**

Practice: The authors stated that laparoscopy should be the preferred option provided that it is performed by experienced laparoscopic surgeons.

Research: The authors made no specific recommendations for research, but pointed out the methodological flaws of the current research and the absence of data with respect to other outcome parameters. They did, however, state that it is unlikely that future trials would be carried out given the dramatic increase and popularity of laparoscopic surgeries.

**Bibliographic details**


**PubMedID**

17164582

**DOI**

10.1159/000097950

**Indexing Status**

Subject indexing assigned by NLM

**MeSH**

Chi-Square Distribution; Colon /surgery; Crohn Disease /surgery; Humans; Ileum /surgery; Laparoscopy; Postoperative Complications; Recurrence; Reoperation

**AccessionNumber**

12007001019

**Date bibliographic record published**

31/03/2008

**Date abstract record published**

31/03/2008

**Record Status**

This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.