Oncologic outcomes of laparoscopic surgery for rectal cancer: a systematic review and meta-analysis of the literature

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CRD summary
This review compared the oncologic outcomes in patients with rectal cancer who underwent laparoscopic versus open rectal surgery and concluded that there were no differences. In light of several methodological and reporting weaknesses, the authors' conclusions should be interpreted with caution.

Authors' objectives
To compare the oncologic outcomes in patients with rectal cancer undergoing laparoscopic versus open rectal surgery.

Searching
MEDLINE and Cochrane Database of Systematic Reviews were searched from 1990 to 2007 for studies published in English; search terms were reported. Reference lists of retrieved articles and reviews were searched.

Study selection
Studies of patients who underwent laparoscopic rectal resections for rectal cancer that included comparative survival data and oncologic parameters (recurrence rates, number of nodes retrieved and margin status) were reported were eligible for inclusion. Eligible study designs were retrospective, matched-pair analysis, prospective non-randomised trial or randomised trial. Studies that reported both colonic and rectal outcomes, but did not individually analyse rectal surgery outcomes were excluded. Most studies used both anterior and abdominoperineal resections (although some only performed one type) and some studies used both anterior resection and total mesorectal excision.

The authors stated neither how the papers were selected for the review nor how many reviewers performed the selection.

Assessment of study quality
Randomised trials were evaluated by assessment of the following: inclusion criteria; exclusion criteria; group similarity at baseline; randomisation; and equal use of ancillary treatments. Studies with scores greater than 3 out of 5 were considered high quality. Non-randomised trial quality was evaluated using the Newcastle-Ottowa scale, with modifications, which assessed the following: patient selection; comparability of groups (variables to assess were listed); and outcome assessment. Studies received a score between 0 and 9. The authors did not state how many reviewers performed the quality assessment.

Data extraction
Correlational effect sizes were calculated from extracted p-values, from which Cohen's d was derived. When medians (rather than means) were reported, medians were used, with standard deviations estimated by calculation. The authors stated neither how the data were extracted for the review nor how many reviewers performed the data extraction.

Methods of synthesis
Meta-analyses were performed, with Stouffer's composite Z-value statistic used to pool results (which takes into account the sample size of each study). Heterogeneity was reported as being assessed, but no further details (other than a reference) were provided.

Results of the review
Twenty two studies were included in the review: five randomised trials (n=1,085); and 17 non-randomised trials (n=2,164). All randomised trials scored 4 or 5 out of 5 for study quality. Non-randomised study scores ranged from 2 to 9 out of 9. Ten trials were deemed to be of high quality.

Overall survival was not significantly different between the groups at an average of 4.4 years (72% laparoscopic
versus 65% open, 11 trials, Cohen's d=0.1, p=0.5), nor was mean local recurrence (7% versus 8%, 16 trials, mean follow-up of around 35 months, Cohen's d=0.1) or radial margin positivity (5% versus 8%, 10 trials, Cohen's d=0.1). However, the mean number of nodes removed was significantly greater for the open surgery group (10 laparoscopic vs 12 open, 17 trials, p=0.001). Further results were reported.

Authors' conclusions
This review indicated that there were no oncologic differences between laparoscopic and open resections for treatment of primary rectal cancer.

CRD commentary
The review addressed a clear question, supported by adequate inclusion criteria. Only two databases were searched for studies published in English and there appeared to be no searches for unpublished studies; some relevant studies may have been missed. The authors did not report on use of methods (such as duplicate screening of studies) used to minimise the risks of reviewer error and bias throughout the review, so the effect of these factors could not be ruled out. Although an assessment of study quality was undertaken, only basic information was provided on each study; the general absence of individual study results and confidence intervals meant it was not possible to assess the reliability of pooled results. Also, the decision to pool randomised and non-randomised data, and to not present results of investigations into heterogeneity appeared questionable and made the interpretation of results difficult. In light of these methodological and reporting weaknesses the authors' conclusions should be interpreted with caution.

Implications of the review for practice and research
Practice: The authors stated that hospitals should increase training resources for teaching laparoscopic oncologic techniques, establish proper training methods, and create guidelines for fairly evaluating surgeons wishing to perform minimally invasive colorectal oncologic resections.

Research: The authors did not state any implications for research.

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