CRD summary
This generally well-conducted review concluded that laparoscopic subtotal colectomy was associated with longer operating times but a reduced length of hospital stay compared to open surgery. The evidence was limited by small patient sample sizes and non-randomised study design. The authors' cautious conclusions are likely to be reliable.

Authors' objectives
To evaluate the short term and long term outcomes of patients with benign or malignant diseases of the colon undergoing laparoscopic or open subtotal colectomy.

Searching
MEDLINE, EMBASE and the Cochrane Library were searched between 1990 and 2005. Search terms were reported. Reference lists of relevant studies were checked for additional studies. There were no language restrictions.

Study selection
Studies comparing laparoscopic versus open approaches to subtotal colectomy were eligible for inclusion.

The included studies were either retrospective or prospective case matched studies. No randomised trials were available for inclusion. Patients with either benign or malignant condition of the colon requiring colectomy were included. The patients in the included studies had inflammatory bowel disease, polyposis, colonic inertia or carcinoma of colon. Studies performed in both adult as well as paediatric population were included.

Studies were required to report at least one from a list of outcomes including operative parameters (surgery duration, operative blood loss, etc.), measures of time to recovery and postoperative course, and postoperative adverse events. No primary outcome was specified.

The authors did not state how the papers were selected for the review or how many reviewers performed the selection.

Assessment of study quality
The quality of included studies was assessed using the Newcastle Ottawa Scale, with some modifications tailored to the needs of the review. Studies were evaluated for factors related to patient selection, comparability of study groups and assessment of outcome. Studies achieving five or more out of a maximum possible 11 stars were considered to be of higher quality.

The authors did not state how many reviewers performed the validity assessment of included studies.

Data extraction
Two reviewers independently extracted data from each study to derive odds ratio for dichotomous outcomes and weighted mean difference for continuous outcomes.

Methods of synthesis
The pooled odd ratios or weighted mean differences and their 95% confidence intervals (CIs) were calculated using a random-effects model. Publication bias was visually assessed by means of a funnel plot. Statistical heterogeneity was assessed using the $\chi^2$ and I² methods. Sensitivity analysis was undertaken by performing subgroup analysis based on study quality, year of publication, sample size, age group of patients and type of disease.

Results of the review
Eight studies (n=336 participants) were included; four were prospective case-matched studies and four were...
retrospective studies. Six studies were published in or after year 2000. Neither of the two studies published before 2000 were of high methodological quality.

Five percent (range 0 to 11.8%) of patients who underwent laparoscopic resection of the colon went on to require open surgery.

Operative time: Surgery duration was significantly longer in the laparoscopy group (weighted mean difference of 86.20 minutes, 95% CI: 67.70, 104.60, p<0.001, n=312 participants) compared to the open surgery group.

Operative blood loss: There was no significant difference in the operative blood loss between the groups. However, data from high quality studies showed less operative blood loss in the laparoscopy group, which reached borderline statistical significance (weighted mean difference -57.52 mL, 95% CI: -115.31, 0.27, p=0.05, n=158 participants).

Length of stay: Hospital stay was shorter in the laparoscopy group (weighted mean difference -2.85 days, 95% CI: -3.24, -2.46, P<0.001, n=336 participants).

Time to tolerate full oral feeds was not different between the laparoscopy and open surgery groups. However, data from studies with high quality showed a shorter time to tolerating oral fluids in the laparoscopy group (weighted mean difference -1.39 days, 95% CI: -2.74, -0.05, P=0.04). Time to the resolution of ileus was also found to be shorter in the laparoscopy group (weighted mean difference -0.74 days, 95% CI: -1.41, -0.06, P=0.03).

Postoperative adverse events: There was no difference in the early or long term complications.

Statistical heterogeneity was noted for some of the outcome measures.

The funnel plot for the main outcome of length of hospital stay did not suggest publication bias.

Authors’ conclusions
Laparoscopic subtotal colectomy was associated with longer operating times but a reduced length of hospital stay compared to open surgery. There were no differences in the short-term as well as long-term complications between the two approaches.

CRD commentary
This review addressed a well-defined question in terms of the participants, intervention and outcomes. The authors searched several relevant databases and made efforts to find further information by reviewing reference lists. It appeared the authors did not search for unpublished studies. The potential influence of publication bias was considered in the report, but no evidence was found for the primary outcome of the review. No restrictions on language were applied. The authors attempted to minimise bias and errors during the review by carrying out the data extraction process using two independent reviewers. It was not clear if study selection and quality assessment were carried out in duplicate, so bias may have been introduced. Significant statistical heterogeneity was noted for some outcomes. The authors also conducted various subgroup analyses to explore both statistical and clinical heterogeneity. The limitation of this generally well-conducted review was the lack of randomised controlled trials and the small sample sizes in the included studies. The authors' cautious conclusions and recommendations for further research appeared appropriate and are likely to be reliable.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that randomised controlled trials, with long term follow-up, are necessary to confirm these findings. They also stated the necessity of studies to address the issue of hospital costs and quality of life.

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