Meta-analysis of laparoscopy-assisted and open distal gastrectomy for gastric cancer

CRD summary
This review concluded that laparoscopy-assisted distal gastrectomy was significantly superior to open distal gastrectomy for several outcomes, such as risk of complications, but inferior or comparable for other outcomes. There were a number of methodological issues, including no assessment of the quality of the evidence, and caution is advised when interpreting the authors’ conclusions.

Authors' objectives
To evaluate and compare the benefits of laparoscopy-assisted distal gastrectomy with those of open distal gastrectomy in patients with gastric cancer.

Searching
MEDLINE, EMBASE, Science Citation Index, and the Cochrane Central Register of Controlled Trials (CENTRAL) were searched for items from January 1990 to November 2009. Search terms were reported.

Study selection
Randomised controlled trials (RCTs) of laparoscopy-assisted distal gastrectomy versus open distal gastrectomy in patients with gastric cancer were eligible for inclusion. The outcomes were operative time, estimated blood loss, number of harvested lymph nodes, time to oral intake, duration of hospital stay, frequency of analgesic administration, complications, rate of tumour recurrence, and 30-day mortality.

The included trials studied laparoscopy-assisted distal gastrectomy versus open distal gastrectomy in Japan, Korea and Italy. They were published between 2002 and 2008 and all but one were of patients with early gastric cancer.

The authors did not state how many reviewers selected trials.

Assessment of study quality
The reviewers did not state that they assessed quality.

Data extraction
The data were extracted for a variety of clinical outcomes, and used to calculate mean differences and odds ratios, together with 95% confidence intervals. Three reviewers extracted these data.

Methods of synthesis
Random-effects meta-analysis was undertaken to calculate pooled weighted mean differences or odds ratios, as appropriate, together with 95% confidence intervals. Statistical heterogeneity was assessed using $I^2$ and $X^2$.

Results of the review
Five RCTs were included in the review, with 326 patients (range 28 to 164).

Compared with open surgery, laparoscopy-assisted distal gastrectomy had statistically significantly decreased blood loss (WMD -121.59mm, 95% CI -174.92 to -68.26; $I^2$=73%; five trials), duration of hospital stay (WMD -2.50 days, 95%CI -4.84 to -0.15; $I^2$=88%; five trials), rate of complications (OR 0.38, 95% CI 0.19 to 0.77; $I^2$=0; five trials), and frequency of analgesic administration (WMD -1.69, 95% CI -2.18 to -1.21; $I^2$=0; three trials). There was no significant difference in mortality (one trial), rate of tumour recurrence (two trials; $I^2$=0), and time to oral intake (five trials; $I^2$=92%).

Compared with open surgery, laparoscopy-assisted surgery had statistically significantly increased operating time (WMD 81.60 minutes, 95% CI 49.64 to 113.56; $I^2$=96%; five trials), and number of harvested lymph nodes (WMD -4.79, 95% CI -6.79 to -2.79; $I^2$=0; five trials).

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Authors' conclusions
Laparoscopy-assisted distal gastrectomy was significantly superior to open distal gastrectomy for the volume of blood loss, duration of hospital stay, level of pain, and risk of complications, but significantly inferior in operating time and number of harvested lymph nodes. There was no difference in mortality, tumour recurrence, or time to oral intake.

CRD commentary
The inclusion criteria were clearly defined and several relevant data sources were searched for published studies. Publication bias was not assessed and cannot be ruled out. Attempts were made to reduce reviewer error and bias during data extraction, but it was not clear if the same methods were used for study selection. No quality assessment appears to have been undertaken. Most of the included trials had samples of fewer than 100 participants. Trial data were combined using random-effects meta-analysis, but significant heterogeneity existed in several analyses, which may mean that the data should not have been pooled.

In view of these methodological issues, and the uncertain quality of the evidence, caution is advised when interpreting the authors' conclusions.

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

Research: The authors stated that more RCTs to compare laparoscopy-assisted distal gastrectomy with open distal gastrectomy were necessary.

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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.