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

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CRD summary
The authors concluded that the short-term outcome of laparoscopy-assisted distal gastrectomy for patients with early gastric cancer was superior to the open procedure. The reliability of the authors' conclusion is limited by weaknesses that included possible publication bias, reviewer error/bias, unclear study quality and small sample sizes.

Authors' objectives
To assess the safety and effectiveness of laparoscopy-assisted and conventional open distal gastrectomy in patients with early gastric cancer.

Searching
MEDLINE, EMBASE, CBM and Cochrane Central Register of Controlled Trials (CENTRAL) were searched with no language limitations. Searches were limited to papers published between July 1999 and June 2009. Search terms were reported.

Study selection
Randomised controlled trials (RCTs) that compared laparoscopy-assisted gastrectomy with open distal gastrectomy in patients with early-stage gastric cancer were eligible for inclusion. Outcome measures were safety markers (surgery duration, blood loss, incidence of complications) and efficacy markers (time to restoration of bowel function measured by time to first flatus or defecation after surgery), length of hospital stay and number of dissected lymph nodes.

Included studies were conducted in Japan, Korea, Italy and USA. Levels of lymph node dissection included D1, D2 and D_{1+α}. Reconstruction of gastrointestinal tract included Billroth I, Billroth II and Roux-en-Y.

The authors did not state how many reviewers assessed studies for inclusion.

Assessment of study quality
Study quality was assessed using guidelines outlined in the Cochrane Handbook of Systematic Reviews (such as adequacy of randomisation, blinding and controls).

The authors did not state how many reviewers assessed study quality.

Data extraction
Data were extracted (using a predefined abstraction form) to enable calculation of odds ratios and mean differences with corresponding 95% confidence intervals (CIs).

The authors did not state how many reviewers extracted data.

Methods of synthesis
Pooled odds ratios and weighted mean differences (WMDs) with corresponding 95% CIs were calculated using fixed-effect meta-analysis (where there was no evidence of statistical heterogeneity) or random-effects meta-analysis (where there was evidence of statistical heterogeneity). Heterogeneity was assessed using $X^2$ and $I^2$.

Results of the review
Six RCTs (218 patients, range 20 to 59) were included. The authors reported that the included trials were of varying quality but did not supply full details.

Compared with open resection, laparoscopic resection was associated with less blood loss (WMD -121.86, 95% CI -145.61 to -98.11; $I^2$=67.8%), earlier postoperative first flatus (WMD -0.95, 95% CI -1.09 to -0.81; $I^2$=73.5%), shorter duration of hospital stay (WMD -2.27, 95% CI -3.47 to -1.06; $I^2$=79.8%), longer surgery times (WMD 58.71, 95% CI...
52.69 to 64.74; $I^2=94.8\%$) and fewer lymph nodes dissected (WMD -3.64, 95% CI -5.80 to -1.47; $I^2=8.1\%$).

There was no significant difference between groups in postoperative complications ($I^2=11.7\%$).

**Authors' conclusions**
The short-term outcome of laparoscopy-assisted distal gastrectomy for patients with early gastric cancer was superior to the open procedure; its long-term outcome should be proven by further RCTs.

**CRD commentary**
The review addressed a clearly stated question. Inclusion criteria were specified. Four databases were searched without language restrictions, which minimised the chances of language bias. The authors did not appear to search sources of grey literature sources so some relevant papers may have been missed. It was unclear whether review processes were conducted in duplicate so the possibility of reviewer error and bias could not be excluded. Study quality was assessed but full results were not reported so the quality of included studies was unclear. The decision to combine outcomes with high statistical heterogeneity using fixed-effect meta-analysis may have been inappropriate given evidence of substantial heterogeneity. Only six studies were included and these had small sample sizes.

The reliability of the authors' conclusion is limited by weaknesses that included possible publication bias, reviewer error/bias, unclear study quality and small sample sizes.

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

**Practice:** The authors did not state any implications for practice.

**Research:** The authors stated that additional multicentre RCTs were needed to compare the long-term efficacy of laparoscopy-assisted gastrectomy with that of open distal gastrectomy in patients with gastric cancer.

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