Laparoscopic Nissen fundoplication with or without short gastric vessel division: a meta-analysis
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CRD summary
The review concluded that short gastric vessel division during laparoscopic Nissen fundoplication was associated with longer operative time and hospital stay. No differences in functional outcomes were found at one and 10 years follow-up. Limitations of the evidence base (only a few small and low quality trials) mean that the conclusions should be regarded as provisional.

Authors' objectives
To compare perioperative complications and functional outcomes for laparoscopic Nissen fundoplication with or without short gastric vessel division (SGVD).

Searching
MEDLINE, EMBASE, Cochrane Central Register of Controlled Trials (CENTRAL) and Science Citation Index Expanded were searched to April 2010 for articles that had been published or accepted for publication. Search terms were reported and no language restrictions were applied. References of included studies were handsearched for further studies.

Study selection
Randomised controlled trials (RCTs) that compared laparoscopic Nissen fundoplication with or without SGVD in patients with gastro-oesophageal reflux disease were eligible for inclusion. Outcomes of interest included perioperative morbidity and mortality, recurrence rate, length of stay and short- and long-term functional outcomes. Patients could be of any age or sex. Cases all had to be elective.

Included RCTs were published between 1997 and 2009. Mean patient age ranged from 45.1 to 52 years and 46% to 79% were men. Endoscopic signs of gastro oesophageal reflux disease were found in most patients (range per trial arm 19% to 100%). The proportion of patients with total time oesophageal pH of less than 4 over 24 hours monitoring ranged from 10% to 76%. Resting pressures in the lower oesophageal sphincter ranged from 6mmHg to 21mmHg. SGVD techniques varied across the trials.

Two reviewers independently selected studies for inclusion.

Assessment of study quality
Risk of bias was assessed in relation to adequacy of inclusion and exclusion criteria, randomisation, sample size calculation, baseline comparability, blinding, cross-over, loss to follow-up, allocation concealment and intention-to-treat analysis. Two reviewers independently performed the quality assessment.

Data extraction
Two reviewers independently extracted data to calculate odds ratios and 95% confidence intervals (CIs) for dichotomous outcomes and mean differences with 95% CIs for continuous outcomes. Median values were used where mean values were not available for continuous outcomes. Where standard deviations were not available, they were calculated according to the Cochrane Collaboration’s guidelines with the assumption that both groups had equal variance.

Methods of synthesis
Pooled effect estimates and their corresponding 95% CIs were calculated using both fixed-effect and random-effects models. Statistical heterogeneity was assessed using $X^2$ and $I^2$ statistics ($I^2<30\%$ or less indicated low heterogeneity between studies). Where substantial heterogeneity was indicated, only the random-effects model was used for meta-analysis.
Results of the review

Five RCTs (388 patients) were included in the review and meta-analysis. All five trials reported inclusion and exclusion criteria, and comparability of groups at baseline. Four trials reported loss to follow-up and three reported randomisation techniques. Two trials performed intention-to-treat analyses and two reported cross-over. Allocation concealment and use of blinding were each only reported by one trial. None of the trials reported sample size calculations.

Compared with the SGVD group, no-SGVD groups had statistically significantly shorter operative time (mean difference -25.50 minutes, 95% CI -35.98 to -15.02; I²=87%; five trials) and postoperative length of stay (mean difference -0.68 days, 95% CI -0.92 to -0.45; I²=91%; five trials). No statistically significant differences were observed between the groups in relation to morbidity (five trials; I²=0%) and conversion rate (three trials; I²=26%).

At one-year follow-up (three trials), no statistically significant differences were found between SGVD and no-SGVD groups for incidence of dysphagia (three trials; I²=0%), heartburn (three trials; I²=0%), regurgitation (three trials; I²=0%) or gas bloat (two trials; I²=48%). Similar results were found for the same outcomes at 10 years follow-up (two trials; I² values were all 0%).

Authors' conclusions

SVGD during laparoscopic Nissen fundoplication was associated with longer operative time and hospital stay. No differences were found in functional outcomes at one and 10 year follow-up assessments.

CRD commentary

The review question was clear and inclusion criteria were clearly defined. Several relevant databases were searched but the restriction to articles that were published or accepted for publication increased the risk that relevant studies were missed. Efforts were made to minimise reviewer error and bias throughout the review process. Suitable criteria were used to assess study quality; results showed that the studies were generally of low quality. Study details were presented and revealed clinical and methodological diversity across the studies. The methods of synthesis seemed appropriate but the authors acknowledged that the small sample sizes of the trials likely influenced their methodological quality and the levels of statistical heterogeneity shown.

Overall, this seemed a well-conducted review. The authors' conclusions reflect the evidence presented but limitations of the evidence base (only a few small and low quality trials) mean that the conclusions should be regarded as provisional.

Implications of the review for practice and research

Practice: The authors stated that routine use of SGVD may not be necessary in laparoscopic Nissen fundoplication.

Research: The authors stated that large multicentre randomised trials with standard objective outcome assessment were required to establish the value of laparoscopic Nissen fundoplication with or without SGVD.

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