Endoscopic stenting versus gastrojejunostomy for palliation of malignant gastric outlet obstruction
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CRD summary
The review concluded that endoscopic stenting was a safe, effective, and minimally invasive option for palliation of malignant gastric outlet obstruction. This conclusion did not reflect that significantly greater technical success was found with gastrojejunostomy. As only a small number of small trials (many of low/unclear quality) contributed to each analysis, the reliability of the authors’ conclusion is questionable.

Authors’ objectives
To determine the efficacy of endoscopic stenting versus gastrojejunostomy in patients with malignant gastric outlet obstruction.

Searching
PubMed, Chinese Biomedical Database, and the Cochrane Library were searched from 1996 up to December 2010 unrestricted by language; search terms were reported. Only full text articles were included.

Study selection
Randomised controlled trials (RCTs) and controlled clinical trials (CCTs) that compared endoscopic stenting with gastrojejunostomy (open and laparoscopic) for the palliation of gastroduodenal obstruction due to inoperable malignant diseases were eligible for inclusion. Eligible primary outcomes included technical success, clinical success, time in oral intake (days), length of survival, and quality of life. Secondary outcomes included: complications and mortality, hospital stay (days), and medical costs. Selected outcome definitions were reported in the paper.

The types of stent used in included trials were the Enteral Wallflex stent, Wallstent, and Ultraflex stent (where reported). The mean age of included patients ranged from 61 to 80 years (where reported). The location of neoplasm varied and included the pancreas, duodenum, stomach, and bile duct. Included trials were conducted in the Netherlands, UK, Italy, China, USA and Sweden.

Two reviewers independently selected trials for inclusion in the review. Any disagreement was resolved by discussion and consensus with the remaining members of the review team.

Assessment of study quality
Two reviewers assessed the quality of the included trials using the checklist from the Dutch Cochrane Collaboration. Criteria considered were: randomisation; comparability of study arms at baseline; concealment of allocation; intention-to-treat analysis; blinding and data collection; completeness of follow-up; similarity of non-trial treatment; and duration of follow-up. Any disagreement was resolved by discussion and consensus with the remaining members of the review team.

Data extraction
Two reviewers independently extracted data on mean differences (MD) for continuous outcomes and odds ratios (OR) for dichotomous variables, with 95% confidence intervals (CI). Disagreements were resolved by discussion and consensus with the remaining members of the review team.

Methods of synthesis
Pooled weighted mean differences (WMD) and odd ratios, with 95% confidence intervals, were calculated using a fixed-effect model unless significant heterogeneity was found, in which case a random-effects model was used. Statistical heterogeneity was investigated using the Cochran's Q-test and $I^2$. Subgroup analyses were also performed by study design (RCT and CCT).
Where pooling of data was not possible, a narrative account was used.

**Results of the review**

Six trials were included in the review; three RCTs (82 patients) and three CCTs (110 patients). Only one RCT reported appropriate allocation concealment. Two trials reported use of intention-to-treat analyses. All trials blinding was described as unclear or unblinded. Follow-up was reported as 100% in all trials. Length of follow-up ranged from one to three months.

A significant difference in favour of gastrojejunostomy was found for overall technical success (OR 0.10, 95% CI 0.02 to 0.47; $I^2=0\%$; five RCTs) compared with endoscopic stenting. When analysed by study design, technical success remained significant only in the analysis of CCTs (OR 0.06, 95% CI 0.01 to 0.52; $I^2=0\%$; three CCTs).

Significantly fewer minor complications were found with endoscopic stenting compared with gastrojejunostomy (OR 0.28, 95% CI 0.10 to 0.83; $I^2=49\%$; three RCTs), but moderate heterogeneity was found.

There was no statistically significant difference between endoscopic stenting and laparoscopic gastrojejunostomy for clinical success (one RCT, one CCT), length of survival (one RCT, three CCTs), mortality (one RCT, two CCTs), and major complications (three RCTs). No significant heterogeneity was reported for overall estimates (but significant heterogeneity was found for mortality in the analysis of CCTs). Two RCTs reported a shorter time to oral intake of food with endoscopic stenting compared with gastrojejunostomy (mean intake was 3.6 days shorter).

One RCT found no significant differences between groups for health-related quality-of-life scores. One RCT reported significantly higher mean scores for physical health in the endoscopic stenting group than the gastrojejunostomy group after one month. Two CCTs found significant improvement from baseline in dysphagia and eating restrictions in both groups; significant improvements in dry mouth, and reflux were only found in endoscopic stenting.

**Cost information**

Total medical costs ranged from US $7,088 to $11,720 in the endoscopic stenting group and $9,187 to $16,536 in the gastrojejunostomy group (one RCT and one CCT). Hospital stay costs ranged from $4,309 to $6,215 in the endoscopic stenting group and $8,684 to $9,403 in the gastrojejunostomy group (one RCT and one CCT).

**Authors' conclusions**

Endoscopic stenting was a safe, effective and minimally invasive option for palliation of malignant gastric outlet obstruction.

**CRD commentary**

The review question was supported with clear inclusion criteria. Several databases were searched with no language restrictions. No apparent attempt was made to locate unpublished articles, so it was possible that relevant data may have been missed. Appropriate steps were taken to minimise the likelihood of error and bias in the selection, extraction, and quality assessment of the included trials.

Relevant criteria were considered in the assessment of trial quality and their results were clearly reported. The quantitative analysis appeared appropriate; heterogeneity was assessed. The authors acknowledged a number of limitations including small sample sizes and heterogeneity for stents, underlying malignant disease, duration of obstruction, and expertise in treatment.

Given that significantly greater technical success was found with gastrojejunostomy, the conclusion did not appear to reflect fully the evidence presented. As only a small number of small trials (many with methodological limitations or unclear quality) contributed to each analysis, the reliability of the results and the authors' conclusion is questionable.

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

**Practice:** The authors stated that supportive evidence suggested endoscopic stenting should be considered as the gold standard treatment for malignant gastric outlet obstruction.

**Research:** The authors stated that further larger, well-designed RCTs (with classification of the primary diseases and a longer follow-up) were needed to validate these findings.
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