Treatment of malignant gastric outlet obstruction: endoscopic implantation of self-expanding metal stents versus gastric bypass surgery

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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
The study assessed endoscopic stent implantation in the treatment of gastric outlet obstruction. This technology was compared with gastric bypass surgery.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients who underwent palliative endoscopic stenting or surgery for malignant gastric outlet obstruction. Patients without obstructive symptoms who had nonetheless undergone surgery were excluded.

Setting
The study setting was inpatient tertiary care. The economic study was undertaken at the Department of Surgery, Medical University of Graz, Austria.

Dates to which data relate
The effectiveness and resource use data were collected from October 2001 to December 2004. The price year was not reported.

Link between effectiveness and cost data
The costing was undertaken retrospectively on the same patient sample as that used in the effectiveness study.

Study sample
No sample size appears to have been determined in the planning phase of the study in order to ensure a certain power. The study included consecutive histories of 22 patients who underwent palliative endoscopic stenting and 17 patients who underwent gastric bypass surgery for malignant gastric outlet obstruction between October 2001 and December 2004. No patient refused access to his or her clinical data.

Study design
This was a retrospective cohort study that was undertaken at a single centre (Department of Surgery, Medical University of Graz, Austria). It was unclear from the study whether the analysts were blinded to the intervention received by the patient. Patients took part in the study between October 2001 and December 2004. The length of the follow-up period
was unclear.

**Analysis of effectiveness**
The primary health outcomes were improvement in symptoms, procedure-related mortality, survival time, and time until oral feeding. The authors did not define how improvement in symptoms was assessed or judged. No patient appears to have been excluded because of incomplete data. The authors reported baseline patient characteristics for the two groups, such as age, gender, primary and secondary tumours, site of obstruction, clinical symptoms and degree of obstruction. However, they did not report whether the patient groups were comparable at analysis, nor did they provide the results of any statistical analyses to show if any differences in baseline characteristics were statistically significant.

**Effectiveness results**
Obstructive symptoms improved in all 22 (100%) patients after endoscopic stenting compared with 11 (64.5%) patients after palliative gastric bypass surgery, (p=0.0038).

The procedure-related mortality rate was 0% after endoscopic stenting and 17.6% (n=3) after palliative gastric bypass surgery, (p=0.2276).

The median survival time was 131 days after endoscopic stenting and 71 days after palliative gastric bypass surgery, (p=0.2489).

The median time to oral feeding was 1 day after endoscopic stent placing and 6 days after palliative gastric bypass surgery, (p<0.0001).

**Clinical conclusions**
The authors concluded that endoscopic stent implantation, as palliative treatment of malignant gastric outlet obstruction or a malignant stenosis in the upper part of the jejunum, was a highly effective and extremely safe method that was well tolerated by the patients.

**Measure of benefits used in the economic analysis**
The authors did not derive a summary measure of benefit. In effect, a cost-consequences analysis was performed.

**Direct costs**
The direct costs to the health care provider (i.e. the hospital) were included in the analysis. The authors reported no details of either the costs included in the analysis or the source of the unit costs, stating only that hospital charges were included. Discounting does not appear to have been relevant as the costs seem to have been incurred during less than 1 year. The price year was not reported. The authors reported the median costs as well as the median length of hospital stay.

**Statistical analysis of costs**
The median hospital charges were reported. The authors reported the uncertainty or variability around these median values, but it was unclear if these represented 95% confidence intervals, interquartile ranges or ranges. The authors reported that comparisons of continuous data were undertaken using Mann-Whitney tests. A p-value of less than 0.05 was considered statistically significant.

**Indirect Costs**
The productivity losses were not included.
Currency
Euros (EUR).

Sensitivity analysis
The examination of uncertainty was restricted to the statistical analysis reported above (see 'Statistical Analysis of Quantities/Costs').

Estimated benefits used in the economic analysis
See the 'Effectiveness Results' section.

Cost results
The median hospital charges were EUR 2,142 (1,173 to 4,515) after stent implantation and EUR 6,617 (2,093 to 27,199) after conventional bypass surgery, (p<0.0001).

Synthesis of costs and benefits
The costs and benefits were not combined as stent implantation was found to be both more effective and less costly than bypass surgery.

Authors’ conclusions
Endoscopic stent implantation, as palliative treatment of malignant gastric outlet obstruction or a malignant stenosis in the upper part of the jejunum, was a highly effective and extremely safe and cost-effective method.

CRD COMMENTARY - Selection of comparators
An explicit justification was given for using gastroenteric bypass surgery as the comparator. It represented the mainstay in the treatment of outlet obstruction. You should decide if this health technology represents current practice in your own setting.

Validity of estimate of measure of effectiveness
The analysis was based on a retrospective cohort study. Such a study design can be associated with some limitations, such as the possibility of inclusion bias and the loss of information due to missing records and clinical history. The study sample appears to have been representative of the study population. The authors reported ample details of the patients’ baseline characteristics, including demographics and clinical data. However, they did not report whether the patient groups were comparable, nor did they provide the results of statistical analyses of baseline differences between the two groups.

The authors did not report the length of the follow-up period. Further, the type of surgery was not constant over the 4 years during which patients took part in the study. During the first 2 years the majority of patients underwent gastric bypass surgery, whilst during the last 2 years the majority underwent stent implantation. Therefore, differences in outcomes could have arisen from external factors such as improved medical care over time or other advances in medicine. The study sample was very small and the study appears to have had insufficient power to detect differences in mortality rates between the two groups.

Validity of estimate of measure of benefit
The authors did not derive a summary measure of benefit. In effect, a cost-consequences analysis was performed. The comments in the 'Validity of estimate of measure of effectiveness' field (above) therefore apply.
Validity of estimate of costs
The authors provided no details of the costing study. Consequently, it was unclear whether all the cost categories were included in the analysis. In addition, this lack of detail will limit the generalisability of the authors' results. Resource use (e.g. length of hospital stay) was derived from the effectiveness study. Charges were used to proxy prices, which might not reflect the true costs of the services provided by the hospital. Since the costs appear to have been incurred during less than 1 year, discounting was not appropriate and was not performed. The authors reported the statistical analyses used to test differences between the two groups, as well as the results of these. However, they only reported the median costs and no mean charges were reported. The price year was not reported, which will hinder future inflation exercises.

Other issues
The authors compared their findings with those from other studies that had also found gastric surgery to be associated with significant morbidity and mortality and higher hospital charges. The issue of generalisability to other settings was not addressed. The authors do not appear to have presented their results selectively. However, it would have been appropriate to emphasise the important limitations of the study in order to qualify the results and conclusions. The authors reported no limitations to their study.

Implications of the study
The authors suggest that implantation of self-expanding metal stents should be the first choice in palliative treatment of malignant stenosis. However, as already highlighted, the reader should be aware of the important limitations of this study.

Source of funding
None stated.

Bibliographic details

Other publications of related interest

Indexing Status
Subject indexing assigned by CRD

MeSH
Cost-Benefit Analysis; Gastric Bypass; Gastric Outlet Obstruction; Hospital Costs; Length of Stay; Mortality; Palliative Care; Stents

AccessionNumber
22007000215
Date bibliographic record published
31/07/2007

Date abstract record published
31/07/2007