A randomized controlled clinical trial of palliative therapies for patients with inoperable esophageal cancer
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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.

CRD summary
The aim was to estimate the clinical effectiveness and costs of self-expanding metal stents compared with rigid plastic stents and other palliative therapies in patients with inoperable oesophageal cancer. The authors concluded that metal stents were equivalent in clinical and cost-effectiveness compared with other treatments and so patient and tumour characteristics should guide treatment decisions. In summary, the methods were satisfactory and appropriate and the authors' conclusions appear to be reasonable.

Type of economic evaluation
Cost-utility analysis

Study objective
The aim was to estimate the clinical effectiveness and costs of self-expanding metal stents (SEMS) compared with rigid plastic stents and other palliative therapies in patients with inoperable oesophageal cancer.

Interventions
Two sizes of SEMS (18mm and 24mm) were compared with rigid plastic stents, and a combination of non-stenting therapies, which included laser therapy, argon beam photocoagulation, external beam radiotherapy, intra-luminal brachytherapy, bipolar circumactive probe electrocoagulation, and endoscopic ethanol tumour necrosis. The non-stent therapies were chosen according to the usual care in the relevant clinical centres and guided by individual patient and tumour characteristics.

Location/setting
UK/out-patient care.

Methods
Analytical approach:
This economic evaluation was undertaken alongside a multi-centre randomised controlled trial (Shenfine, et al. 2005, see 'Other Publications of Related Interest' below for bibliographic details). The authors stated that this was the first prospective randomised trial that evaluated these palliative therapies, with a sample size (215 patients) powered to detect clinically meaningful differences between therapies and between costs. The time horizon was from study baseline to closure (duration not stated) or patient death. The authors reported that the study was carried out from a third-party payer perspective.

Effectiveness data:
The primary outcomes included dysphagia grade and health-related quality of life (HRQoL). These outcomes were measured using questionnaires during patient interviews at baseline, one week and six weeks after treatment, and six-weekly thereafter until study closure or death. Dysphagia was measured on a five-point scale and HRQoL was measured using Spitzer's Quality of Life Index and the European Organization for Research and Treatment of Cancer (EORTC), quality of life questionnaire (QLQ-30) and oesophageal module (OES-24). An intention-to-treat approach was used. Parametric and non-parametric tests and analysis of covariance statistics were used to estimate the change in dysphagia and HRQoL scores across groups over time.

Monetary benefit and utility valuations:
The UK utility weights were measured using the European Quality of life (EQ-5D) questionnaire.

Measure of benefit:
The measure of benefit was quality-adjusted life-years (QALYs).

Cost data:
The resource types were collected within the study and included all hospital visits, pre-, during and post-treatment investigations (staff time, capital, equipment, and medications), and community costs using a patient diary. The unit costs were obtained from National Health Service (NHS) estimates while retail prices were used for SEMS. Non-parametric bootstrap methods were used to analyse the differences in total costs and QALYs. All costs were reported in UK pounds sterling (£), but the price year was not stated.

Analysis of uncertainty:
One-way sensitivity analyses were performed, in which the unit costs were varied by 25% either side of the mean. Bootstrap analysis simulated the different possible combinations of cost and QALY pairs and was illustrated in a bootstrap plot and cost-effectiveness acceptability curve.

Results
The total costs were £5,251 with 18mm SEMS, £4,344 with 24mm SEMS, £4,288 with rigid stents, and £5,861 with non-stent treatments. Total mean costs were not significantly different between the combined SEMS and combined non-SEMS treatments with a mean difference of £244 (95% CI -845 to 1,333). Bootstrapping analyses confirmed the cost similarities between these two groups. The total cost findings were reported to be robust to variation in the separate cost estimates.

HRQoL and dysphagia scores from all questionnaires worsened immediately following treatment, but recovered to baseline levels by six weeks after treatment, including pain scores on the EORTC QLQ-30.

The total QALYs were 0.17 with 18mm SEMS, 0.20 with 24mm SEMS, 0.23 with rigid stents, and 0.25 with non-stent treatments. These differences were not significant (p=0.30).

Bootstrapping the pairs of incremental cost and QALY differences for the SEMS and non-SEMS treatments showed that the non-SEMS patients were more likely to have greater QALYs than the SEMS patients, while the costs remained equivalent. With 1,000 simulations, there was a 55% probability of SEMS being cost-effective at a cost per QALY threshold of £50,000.

Authors' conclusions
The authors concluded that SEMS did not offer superior clinical or cost-effectiveness outcomes compared with other single modality palliative treatments for patients with oesophageal cancer.

CRD commentary
Interventions:
The interventions were clearly reported and, although the non-stenting treatment group was a combination of different therapies with similar effectiveness, this reflected the usual clinical practice across the participating centres.

Effectiveness/benefits:
The effectiveness data were based on a rigorous randomised, controlled, multi-centre trial, sufficiently powered to detect meaningful differences in both the primary outcomes and cost estimates. The follow-up period was not stated. The measurement of HRQoL and utility values involved widely-used and accepted instruments including the EORTC QLQ-30 and the EQ-5D. Bootstrapping statistics were a valid approach for dealing with QALYs with right-censored data. In-depth reporting of the secondary outcomes, including survival, mortality, re-interventions, and treatment complications, provided valuable additional information on the impact of treatments.

Costs:
The types of costs included appeared to be comprehensive and relevant for a third-party payer system perspective. The
unit costs were clearly tabulated and their sources were given. The price year was not reported, which will make reflation exercises difficult.

Analysis and results:
The costs and effects were combined into incremental cost-effectiveness ratios, but neither these nor the sensitivity results were explicitly reported. This is likely to have been due to the cost-effectiveness component being secondary to the primary clinical outcomes. The separate cost and QALYs analyses were well-described and reasonably transparent. Readers were referred to the technology assessment publication for further details on missing data and the overall cost-utility results (Shenfine, et al. 2005).

Concluding remarks:
The methodology appears to have been appropriate and thorough. The cost-effectiveness results could have been reported more extensively, but the conclusions reached by the authors appear to be appropriate.

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