The cost effectiveness of metal oesophageal stenting in malignant disease compared with conventional therapy

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
Expanding metal oesophageal stents (Gianturco stents, uncovered Ultraflex stents) to palliate patients with inoperable oesophageal carcinoma.

Type of intervention
Palliative treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients with inoperable oesophageal carcinoma with no previous intervention, radiotherapy or chemotherapy.

Setting
The practice setting for the study was a hospital in north-west England. The economic study was performed in the United Kingdom.

Dates to which data relate
Neither years during which the data were collected for the effectiveness analysis nor the price date were stated.

Source of effectiveness data
The evidence for final outcomes was derived from a single study.

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

Study sample
64 consecutive patients with inoperable oesophageal cancer who had no previous surgery or evidence of fistulation on contrast studies, comprised the study sample. All patients were new referrals with no previous intervention, radiotherapy or chemotherapy. 32 patients (mean age 72.5 years; range: 60-86) received conventional palliation (BICAP diathermy and alcohol injection); if the patient's symptoms did not improve or the patient required regular re-intervention, Atkinson tube insertion was performed. The other 32 patients (mean age 75.5 years; range: 43-91) were palliated with a total of 37 expandable stents. Power calculations were not used to determine the sample size.
Study design
This was a non-randomised trial with concurrent controls, carried out in a single centre. All the patients were followed from presentation to death, with details of their length of survival and dysphagia scores before and after treatment being recorded.

Analysis of effectiveness
The basis for the analysis of the clinical study was not stated. The primary health outcome used in the analysis was the effectiveness of palliation, which was measured by recording mean dysphagia scores. Dysphagia was assessed at patient clinics and by regular telephone contacts at a minimum of at least 3-monthly intervals using a modified score of Mellow & Pinkas. Other health outcomes included in the analysis were survival rate, days in hospital, and number of procedures. Although the patients were not randomised, the two groups were matched to ensure comparability in clinical manifestation and average age.

Effectiveness results
The effectiveness results were as follows:

Patients palliated conventionally survived 50% longer (mean: 157.7 days; range: 30-360 days) than those in the metal stent group (mean: 112 days; range: 8-290 days), although this was not statistically significant.

Patients palliated conventionally underwent 3.56 procedures (range: 1-9), while those with metal stents underwent 1.22 procedures (range: 1-5)(p>0.001).

Patients palliated with metal stents spent fewer days in hospital, 12.6 days (range: 2-40 days), compared with those conventionally treated who spent 25.5 days (range: 1-68 days) in hospital (p=0.002). This equates to a re-intervention every 44 days of survival in the conventional group and every 92 days in the metal stent group.

The time spent in hospital per month survived averaged 4.8 days in the conventional group and 3.4 days in the metal stent group.

At presentation/first intervention no significant difference in the mean dysphagia score between the groups was seen (conventional treatment 3.0, metal stents 3.3). Following conventional therapy, the mean best dysphagia score fell to 2.2, a reduction of 0.8 points. However, following metal stent insertion the mean dysphagia score dropped to 1.3 by a significantly greater 2 points (p<0.001).

Two patients receiving conventional palliation died as a result of perforations caused at Atkinson tube insertion. There were no procedure-related deaths in those palliated with metal stents, although four patients needed to undergo more than a single procedure.

Clinical conclusions
The study demonstrates several advantages of metal stents over conventional treatments, most importantly the efficacy of the stents in reducing dysphagia when compared with conventional therapy. In addition, the technique of metal stent insertion is shown to be safe with a low morbidity comparable with that described in other reports and highlights their safety and ease of use when compared with plastic endoprostheses.

Measure of benefits used in the economic analysis
Days survived and units improvement of dysphagia were the measures of benefit used in the economic analysis.

Direct costs
Resource information was based on actual data and the elements collected included in-patient episodes, the number and type of diagnostic and support services and the total cost of drugs required to achieve effective palliation. The unit costs
applied to value the resources consumed were obtained from the hospital finance department. Costs and resource quantities were analysed separately. Discounting was not carried out because of the short time frame of the cost analysis.

**Indirect Costs**
Not included.

**Currency**
UK pounds sterling (€).

**Sensitivity analysis**
Not performed.

**Estimated benefits used in the economic analysis**
See effectiveness results above.

**Cost results**
The overall costs of palliation were significantly lower in the metal stent group, 2,817 (range: 1,189 - 8,500) than in those palliated conventionally, 4,566 (range: 540 - 11,396), (p=0.009).

**Synthesis of costs and benefits**
The cost per day of palliation in the metal stent group remained lower but showed no significant difference (metal stents 60, conventional treatment 72), (p=0.6). However, the significantly better palliation observed in the metal stent group means that the daily cost of a one point (1.0) mean improvement in dysphagia was estimated to be 30 in the metal stent group compared with a daily cost of 90 for the conventionally palliated group.

**Authors’ conclusions**
The authors conclude that, despite their initial high costs, use of metal stents produces an overall slight cost saving when compared with diathermy, alcohol injection and Atkinson tube insertion, by virtue of a reduced need for re-intervention and a shortened length of hospital stay.

**CRD COMMENTARY - Selection of comparators**
The reason for the choice of comparators is clear as they represented the common practice in the authors' setting.

**Validity of estimate of measure of benefit**
The authors indicate that the patients in the study were not randomised, but that the two groups exhibited similar characteristics. However, it was also stated that at presentation 6 patients had metastatic disease in the conventional group, compared with 13 in the metal stent group. Also, power calculations were not used to determine sample size and (as the authors indicate) a prospective randomised controlled trial is required.

**Validity of estimate of costs**
Not all resource quantities were reported separately from the prices and only costs incurred by the study hospital were included (and not support from community or social services).
Other issues
A sensitivity analysis could have been used to allow for the uncertainties in the data. Appropriate comparisons were made with other studies.

Implications of the study
Expandable metal stents are likely to become an established method of palliating malignant oesophageal strictures by virtue of their clinical effectiveness. The authors state that their results need to be confirmed in a prospective randomised trial incorporating quality of life data as well as a full economic analysis.

Source of funding
None stated.

Bibliographic details

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Other publications of related interest

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