Covered self-expandable metal stents in pancreatic malignancy regardless of resectability: a new concept validated by a decision analysis

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 authors’ objective was to compare the efficacy and cost-effectiveness of covered self-expandable metal stents (CSEMS) compared with plastic stents (polyethylene stents with holes and DoubleLayer stents) in patients with pancreatic cancer and distant biliary obstruction. The authors stated that CSEMS had been shown to be cost-saving and that they might be more cost-effective. Nevertheless, the authors' conclusions should be treated with caution, mainly because of the weakness of the primary study design (retrospective case series) and the scarce reporting of the sources used to model the other two alternatives.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The authors’ objective was to compare the efficacy and cost-effectiveness of covered self-expandable metal stents (CSEMS) compared with plastic stents (polyethylene stents with holes and DoubleLayer stents) in patients with pancreatic cancer and distant biliary obstruction, without regard to the surgical resectability.

Interventions
Biliary stenting is a widely used palliative strategy in pancreatic cancer complicated with distant biliary obstruction. Though the traditional stent used is made of polyethylene, newer options include CSEMS and DoubleLayer stents that have a more prolonged patency rate, and in the case of CSEMS can be endoscopically removed, and are suitable for patients with a longer life expectancy. The CSEMS evaluated were wallstents covered with Permalume (Boston Scientific, Massachusetts, USA).

Location/setting
USA/university hospital inpatient care in Virginia.

Methods
Analytical approach:
A study of CSEMS in the authors’ institution was combined with published data to build a simple decision tree that compared the expected cost of the three strategies. The time horizon of the model was not directly reported but was stated to have been short. The perspective adopted in the study was not reported, but it appears to have been that of the insurer.

Effectiveness data:
Case series data from 101 study patients operated on between 2001 and 2005 were used to evaluate the patency rate of CSEMS. The follow-up ranged from 1 to 25 months, with mean survival of 5.9 months. Patency rates from the other two stents were extracted from a single reference (randomised clinical trial). No review of the literature was reported.

Monetary benefit and utility valuations:
None.

Measure of benefit:
The authors assumed similar survival among the alternatives and stated that the study was thus a cost-minimisation
evaluation. However, revision rates were reported.

Cost data:
The costs included were those of the different stents, endoscopic retrograde cholangiopancreatography (ERCP) with stent placement, or ERCP with stent revision. The resource quantities were taken from the current reported series on CSEMS and from a single reference (from a multicentred randomised trial) for other stents. Medicare reimbursement rates for 2005 were used for relevant codes, and the manufacturers provided stent prices (no price year was reported). A series of 2005 European reimbursement costs from Tarmed Swiss was also used. The currency used was euros (EUR).

Analysis of uncertainty:
There was no description of this in the 'Methods' section of the paper. The authors presented a range for probabilities and costs, without providing their sources or rationale, and then reported two one-way threshold analyses.

Results
The proportions of patients not needing a revision were derived from the authors’ case series (90%) and the one single study source (47% for DoubleLayer and 29% for polyethylene).

The expected total cost of initial CSEMS was EUR 3,177, while that of a Double Layer stent placement was EUR 3,224 and that of a polyethylene stent was EUR 3,570. The higher costs were due to higher revision rates.

CSEMS saved costs if the costs were less than EUR 1,329, or the chance that a revision was required exceeded 12%.

Authors' conclusions
Assuming similar benefits, the authors stated that CSEMS had been shown to be cost-saving given the more prolonged patency and lower chance of malfunction. Thus, they might be a more cost-effective option in in patients with pancreatic cancer and distant biliary obstruction.

CRD commentary
Interventions:
The interventions were adequately described. The different comparators chosen were all possible alternatives. You should judge if they are also relevant in your own setting.

Effectiveness/benefits:
The effectiveness of CSEMS was based on a weak study design (case series), while that of the other two comparators were derived from a single source. There was very little reporting around this issue and no apparent review of the literature, thus there is uncertainty about the quality of the evidence. The authors simply assumed that they had similar survival and therefore performed a cost-minimisation analysis.

Costs:
No study perspective was stated, although the costs evaluated were only those of the hospital. Some costs categories were not included (e.g. hospitalisation not due to surgery, drugs), with an uncertain effect on the results. The level of reporting of the sources used for resource use, methods and range selection for the sensitivity analysis was generally poor.

Analysis and results:
The primary focus of the paper was not to perform an economic evaluation; this seems mainly to have been a 'by-product'. No systematic review of the literature seems to have been performed. Besides the expected value of each strategy cost, little detail was provided. In addition, the authors found the results were sensitive to small changes in selected variables, but they did not state this lack of robustness explicitly.

Concluding remarks:
The authors' conclusions should be treated with caution, mainly because of the weakness of the primary study design (retrospective case series) and the scarce reporting of the sources used to model the other two alternatives.
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