The cost-effectiveness of colonic stenting as a bridge to curative surgery in patients with acute left-sided malignant colonic obstruction: a Canadian perspective

Singh H, Latosinsky S, Spiegel B M, Targownik L E

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 objective of the study was to examine the cost-effectiveness of colonic stenting as a bridge to curative surgery. The authors concluded that colonic stenting was comparable in cost with surgical options and reduced the likelihood of requiring both temporary and permanent stomas. The quality of the study methodology was satisfactory and the results were reported in full. However, there were only brief details of the review of the literature. The authors’ conclusions appear appropriate given the scope of the study.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective of the study was to examine the cost-effectiveness of colonic stenting as a bridge to curative surgery in patients with acute left-sided malignant colonic obstruction.

Interventions
Three strategies were compared for the treatment of patients with acute, malignant chronic obstruction: resective surgery, diverting colostomy and colonic stenting.

The resective surgery strategy consisted of emergent resection of the primary tumour, followed by creation of a diverting colostomy or performance of a primary anastomosis.

The emergency diverting colostomy surgery strategy consisted of emergent creation of a diverting colostomy, followed by elective respective surgery of the tumour and primary anastomosis of the colon.

The emergent colonic stenting strategy consisted of colonic stenting, followed by elective resective surgery of the obstructing tumour.

Location/setting
Canada/inpatient secondary care.

Methods
Analytical approach:
The authors amended a decision analytic model, used to assess the costs and outcomes of the three strategies in the USA (Targownik et al. 2004, see 'Other Publications of Related Interest' below for bibliographic details), to account for differences in the costs and process of care between the USA and Canada. The time horizon of the study was 6 months. The authors reported that the perspective adopted in the economic study was that of Manitoba's provincial health plan.

Effectiveness data:
The authors reported that an extensive review of the literature was performed in order to obtain the probability estimates for each model parameter. They did not provide any other details of the methods used to obtain the studies from which the effectiveness data were derived. However, the base-case values for each model parameter and their sources were reported. The main clinical effectiveness estimate derived from the literature was surgical mortality.
Monetary benefit and utility valuations:
None.

Measure of benefit:
The measures of benefit were surgical death prevented, permanent or temporary stoma avoided, and surgery avoided.

Cost data:
The direct costs included were those relating to surgeon fees for each procedure performed, outpatient follow-up visits, emergency visits, and inpatient hospital services and supplies. The costs and reimbursement for physician services were obtained from Manitoba's health services insurance plan manual. The costs of inpatient hospital services and supplies were obtained from the 1994 cost list for Manitoba Health Services. The costs of the stent apparatus were obtained from charges currently billed by the manufacturer. The weekly costs of outpatient stoma were obtained from the Manitoba ostomy programme. All costs were updated to 2004 prices. The currency used was Canadian dollars (CAD).

Analysis of uncertainty:
A series of one- and two-way sensitivity analyses was performed by varying the costs and probability estimates over a wide range of values.

**Results**
The average number of operations per patient was 1.03 for colonic stenting, 1.32 for resective surgery and 1.30 for diverting colostomy.

The proportion of patients with temporary stoma was 7% for colonic stenting, 44% for resective surgery and 100% for diverting colostomy.

The proportion of patients with permanent stoma was 2% for colonic stenting and 14% for resective surgery and for diverting colostomy.

The average cost per patient was CAD 13,164 for colonic stenting, CAD 13,820 for resective surgery and CAD 11,851 for diverting colostomy.

The costs and benefits were combined using an incremental cost-effectiveness ratio (ICER). When comparing colonic stenting with diverting colostomy, the ICER was CAD 1,415 to prevent a temporary stoma, CAD 1,516 to prevent an operation, CAD 10,791 to prevent a permanent stoma and CAD 15,734 to prevent one additional death. When compared with resective surgery, colonic stenting was found to be dominant (i.e. it was both more effective and less costly).

The results of the sensitivity analyses showed that colonic stenting became the least expensive strategy with a 50% reduction in the costs of stent placement, or when the length of stay in hospital was reduced.

**Authors' conclusions**
The authors concluded that colonic stenting was comparable in cost with surgical options and reduced the likelihood of requiring both temporary and permanent stomas.

**CRD commentary**
**Interventions:**
The three interventions investigated were reported in detail. In addition, an explicit justification was given for using surgical interventions as the comparator: they represented current practice in the authors' settings.

**Effectiveness/benefits:**
Although the authors reported that an extensive review of the literature was performed, no further details of either the review or the studies identified were reported. Consequently, it is not possible to determine whether all the available evidence was included. The authors did, however, report the base-case values employed for each model parameter and the sources on which they were based.
Costs:
The perspective adopted in the economic analysis was clear, and all the relevant major cost categories appear to have been included. The authors appropriately reported the sources of the cost data, and provided cost estimates for each parameter used in the model. In addition, the time horizon, price year and currency used were all adequately reported.

Analysis and results:
Appropriate details of the model were reported, although there was no graphical representation of the model itself. A 6-month time horizon was used in the model. The authors reported that a longer time horizon was unlikely to alter the long-term mortality and morbidity, but a longer timeframe would have enabled the authors to estimate life expectancy and any other unexpected outcomes. Uncertainty in the model was evaluated using one- and two-way sensitivity analyses. Although these methods go some way in exploring uncertainty in the model results, a probabilistic sensitivity analysis would be a more thorough way of capturing overall model uncertainty. The limitations of the study were adequately reported.

Concluding remarks:
The quality of the study methodology was satisfactory and the results were reported in full. However, only brief details of the review of the literature, from which the effectiveness parameters were obtained, were reported. The authors’ conclusions appear appropriate given the scope of the study.

Funding
Rudy Falk Clinician Scientist Award; Boston Scientific Inc.

Bibliographic details

Other publications of related interest


Indexing Status
Subject indexing assigned by NLM

MeSH
Aged; Canada; Colonic Neoplasms /complications /surgery; Cost-Benefit Analysis; Humans; Intestinal Obstruction /economics /etiology /surgery; Models, Economic; Prosthesis Implantation /economics /instrumentation; Retrospective Studies; Stents

AccessionNumber
22007000284

Date bibliographic record published
19/02/2007

Date abstract record published
23/12/2008