Is it worth using mechanical sutures in gastric surgery?

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
Mechanical sutures using GIA, TA and EEA Autosuture instruments, versus a manual suture (one layer anastomosis of polyglycolic acid material) in patients undergoing a gastrointestinal anastomosis for various gastric diseases.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients undergoing a gastrointestinal anastomosis for gastric diseases.

Setting
Hospital. The economic study was carried out in Vizcaya, Spain.

Dates to which data relate
Effectiveness and resource use data were collected between 1987 and 1992. The fiscal year was not explicitly stated.

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

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

Study sample
Power calculations were not used to determine the sample size. The study sample consisted of a total of 199 subjects with a mean age of 59.9 (range: 27 - 85) years. The manual group consisted of 60 patients versus 139 patients in the mechanical group.

Study design
The study was a retrospective cohort study, carried out in a single centre. The duration of follow-up was until discharge. No loss to follow-up was reported.
Analysis of effectiveness
The principle (intention to treat or treatment completers only) used in the analysis of the clinical outcomes was not explicitly specified. The primary health outcomes assessed were operating time (minutes), postoperative stay (days), complications (%), and mortality (%).

Effectiveness results
The manual and stapled groups, respectively, had the following outcomes (SD in parentheses where appropriate):

- operating time, 131 (6.2) minutes versus 119 (6.2) minutes;
- postoperative stay, 15.8 (1.5) days versus 15.5 (1.1) days;
- complications, 11.6% versus 13.6%;
- mortality, 1.6% versus 1.4%.

No statistically significant differences were found between the two groups in terms of these variables. Per surgical procedure, the Billroth 1 mechanical suture group had a statistically significantly shorter operating time: 103 (+/- 3.1) minutes versus 123 (+/- 6.3) minutes, \((p<0.01)\). The Roux-en-Y oesophagojejunostomy mechanical group \((n=42)\) had a significantly shorter postoperative stay: 19.3 (2.2) days versus 38 (14.6) days in the manual group \((n=3)\). In terms of complications (manual versus stapled), no statistical significance was found in fistula or leakage from the anastomosis or from the duodenal stump (8.3% versus 7.2%), abdominal abscess (3.3% versus 3.6%) and upper gastrointestinal bleeding (0% versus 2.0%).

Clinical conclusions
The study found no significant difference in hospital stay, complication rate and mortality, as in other previous reports.

Measure of benefits used in the economic analysis
No summary benefit measure was identified in the economic analysis, and only separate clinical outcomes were reported.

Direct costs
Costs were not discounted. Quantities of resources in the form of operating time and postoperative stay were reported separately from the costs. The costs of the two types of anastomosis in total, and for all kinds of operations, were reported separately. The perspective adopted in the cost analysis was not explicitly specified. Sources of cost data were not explicitly specified. The date to which the price data referred was not stated.

Indirect Costs
Not considered.

Currency
US dollars ($) were converted from Spanish Pesetas (Pta) at a rate of Pta140 = $1 (no year or date was specified).

Sensitivity analysis
No sensitivity analysis was performed.

Estimated benefits used in the economic analysis
Cost results
The average cost of the manual procedure was $84.67, compared with an average cost of $542 for mechanical procedure.

Synthesis of costs and benefits
No synthesis of costs and benefits was performed since the use of the manual procedure was the weakly dominant strategy (with equal efficacy and less costs).

Authors' conclusions
Cases exist where mechanical staples are totally necessary (for example when there is difficulty in performing low rectum/oesophagus hand-sewn anastomoses). Otherwise, suture choice should depend upon weighing both advantages and disadvantages.

CRD COMMENTARY - Selection of comparators
The reason for the choice of the comparator is clear.

Validity of estimate of measure of effectiveness
The internal validity of the estimates of effectiveness may be weakened by the retrospective nature of the study.

Validity of estimate of measure of benefit
In view of the lack of a summary benefit measure, the study may be regarded as a cost-consequences analysis.

Validity of estimate of costs
In general quantities were reported separately from costs. However insufficient details of the methods of cost estimation were given. In view of the retrospective study design, absence of sensitivity analysis, and the lack of statistical analysis of the costs, the results need to be treated with some caution.

Other issues
The issue of generalisability to other settings or countries was not addressed.

Implications of the study
The authors recommended that a prospective randomised controlled trial should be conducted for result confirmation.

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None stated.

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