Cost-effectiveness analysis of open colposuspension versus laparoscopic colposuspension in the treatment of urodynamic stress incontinence


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
The authors studied laparoscopic colposuspension compared with open colposuspension for the treatment of urodynamic stress incontinence.

Type of intervention
Treatment.

Economic study type
Cost-utility analysis.

Study population
The study population comprised women with proven stress urinary incontinence requiring surgery.

Setting
The setting was tertiary care (gynaecological centres). The economic study was carried out in the UK.

Dates to which data relate
The effectiveness data were taken from a single paper that was in press at the time of the current report. Resource use was measured during the same clinical study. The price year was 2002/03.

Source of effectiveness data
The effectiveness data were derived from a single study.

Link between effectiveness and cost data
The costing was carried out prospectively on the same sample of patients as that used in the effectiveness study.

Study sample
The authors noted that full details of the trial were reported in a parent study (Kitchener et al. 2006, see ‘Other Publications of Related Interest’ below for bibliographic details). Only details given in the present paper are reported here and the reader is referred to the parent study for more details. The study sample comprised a total of 291 women, 144 in the laparoscopic group and 147 in the open surgery group. Five individuals were reported to have been randomised but did not undergo surgery, and they were therefore excluded from the analysis. No further details were reported.
Study design
The authors designed a randomised controlled trial (the details and the method of randomisation were not reported) based at six gynaecological centres. The patients were followed for 6 months after discharge. No loss to follow-up was reported. No details of any attempts at blinding the patients or clinicians were provided.

Analysis of effectiveness
The analysis was conducted on an intention to treat basis. The primary clinical outcomes reported in the current paper were complications relating to surgery and the clinically superior treatment. The reader is referred to the parent study for more information on clinical outcomes. The current report did not provide an analysis of the comparability of the groups at baseline, or any adjustments for confounding factors.

Effectiveness results
The authors reported that there were no serious complications relating to surgery during the trial and that laparoscopic colposuspension was not inferior to open colposuspension.

Clinical conclusions
The authors concluded that, since laparoscopic colposuspension is not inferior, the "choice of the optimal strategy in this patients’ population should be informed by cost-effectiveness considerations".

Measure of benefits used in the economic analysis
The authors used quality-adjusted life-years (QALYs) as their summary measure of health benefit. Data were collected from trial participants using the EQ-5D questionnaire, which was completed at baseline and 6, 12 and 24 months. The utility scores for the EQ-5D were derived from interviews with a large sample of the UK population. The authors noted that, where appropriate, QALYs were discounted by 3.5%.

Direct costs
The costing analysis was carried out from the perspective of the UK NHS and Personal Social Service. The analysis took account of surgery, hospital stay and the first 6 months after hospital discharge. The data were collected prospectively for each trial participant. Case report forms were used to capture most of the required information, including details on time for anaesthetic induction, time in theatre, complications, length of stay, and health care resource use after discharge. The authors also used hospital-specific questionnaires to gain information that was not expected to differ between treatment arms. Resource use was collected at 6 weeks and 6 months after hospital discharge. Information was also collected on complications and further treatments required. The unit costs were taken from a variety of sources, including ward-specific NHS hospital costs calculated from national averages, the fully allocated cost per day of a urology bed, published salary data, equipment manufacturing prices and the British National Formulary for drug prices. The price year was 2002/03. Discounting was not required given the relatively short time horizon adopted. The unit costs and the quantities were reported separately.

Statistical analysis of costs
Mean differential costs and QALYs were reported with associated 95% credibility intervals (CrIs) to reflect sampling uncertainty around estimates.

Indirect Costs
The indirect costs were not relevant to the perspective adopted and were not included in this study.

Currency
UK pounds sterling (£).
Sensitivity analysis

The base-case analysis for 24 months assumed that no further costs were incurred after the first 6 months post treatment, this assumption being explored in a sensitivity analysis. Also explored in sensitivity analyses were the assumption that no visits had taken place after 6-week follow-up where missing data was prevalent, the impact of using reusable rather than disposable equipment, differences in length of stay and differences in "hotel" costs. Cost-effectiveness acceptability curves (CEACs) were generated to indicate the decision uncertainty surrounding cost-effectiveness for each of the different willingness-to-pay thresholds for health outcomes.

Estimated benefits used in the economic analysis

The mean QALYs at the 6-month follow-up were 0.421 for laparoscopic surgery and 0.416 for open surgery (difference 0.005, 95% CrI: -0.012 to 0.023).

The mean QALYs at the 24-month follow-up were 1.677 for laparoscopic surgery and 1.637 for open surgery (difference 0.04, 95% CrI: -0.009 to 0.086).

Cost results

The mean total costs were 1,805 (standard deviation, SD=471) for laparoscopic surgery and 1,433 (SD=362) for open surgery.

The differential mean cost was 372 (95% CrI: 274 to 471).

Synthesis of costs and benefits

At the 6-month follow-up the estimated incremental cost-effectiveness ratio was 74,400 per additional QALY gained. The CEAC analysis revealed that laparoscopic treatments had a 0% probability of being cost-saving and a 20% probability of being relatively cost-effective at a willingness-to-pay threshold of 30,000.

At the 24-month follow-up the estimated incremental cost-effectiveness ratio was 9,300. The CEAC analysis revealed that laparoscopic treatments had a 50% probability of being relatively cost-effective at a willingness-to-pay threshold of 9,300 and an 86% probability at a threshold of 30,000. This latter result was highly sensitive to the assumption that no significant costs are incurred beyond 6 months of follow-up.

Authors' conclusions

In the first 6-months after treatment, "laparoscopic colposuspension is unlikely to be cost-effective" compared with open surgery but, over the 24-month period, "the laparoscopic procedure might be a cost-effective alternative...providing there are no major cost implications from treatment failure".

CRD COMMENTARY - Selection of comparators

The authors compared laparoscopic with open colposuspension, and described colposuspension as the standard surgical procedure to treat urinary incontinence. Laparoscopic treatment represents the natural choice of the comparator. Standard practice between laparoscopic and open treatment in the authors' setting was unclear, but the authors provided a discussion of the potential advantages of laparoscopic treatment.

Validity of estimate of measure of effectiveness

The authors designed a randomised controlled trial based on six centres across the UK. This design was intended to reduce the possibility of systematic differences between patients in the two groups and hence increase the internal validity of the results. The current report did not provide details of the samples, thus it was not possible to assess the extent to which the patient groups were comparable at analysis. The reader is referred to the parent study for further details.
Validity of estimate of measure of benefit
QALYs were used as the summary measure of health benefit. The estimation of benefits was obtained directly from the effectiveness analysis using the EQ-5D questionnaire and applied to utilities from the EQ-5D. EQ-5D is a well recognised and validated assessment tool that applies to any number of disease states, thus enabling the results to be compared across a broad range of health care-related technologies.

Validity of estimate of costs
The costs were estimated from the perspective of the UK NHS and Personal Social Service. All the costs relevant to these perspectives were included in the analysis. The authors used patient level data where applicable and hospital level data for aspects that would not depend on the arm of the trial to which a patient was assigned. The costs and the quantities were reported separately and in great depth, thereby enabling the reader to gain a valuable understanding of the main cost-drivers. Sensitivity analyses and the use of credibility intervals gave an understanding of the impact of uncertainty on the results obtained.

Other issues
The authors were able to draw some comparisons with existing work, although they noted that there was little pre-existing robust evidence available for comparison. Nevertheless, they observed that their own findings broadly agreed with others in this area. The generalisability of the results was limited in the first place by the use of patient- and institution-specific data, but was later extended greatly by the use of an extensive sensitivity analysis and an exploration of the impact of parameter uncertainty on the results. The authors provided a thorough report of their results and outcomes and gave reference details of the parent clinical study, thereby enabling the reader to gain further information if required.

Several limitations were discussed. For example, the very skilled nature of the surgeons participating in the trial, which might have caused the cost-effectiveness to be better than that for less experienced surgeons in other settings. Also, a societal perspective might have been adopted, recovery time might affect quality of life, and tension-free vaginal tape might be considered a relevant comparator technology.

Implications of the study
The authors did not make any recommendations for policy or practice following on from their study. They also did not note any areas for further work.

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Other publications of related interest
Because readers are likely to encounter and assess individual publications, NHS EED abstracts reflect the original publication as it is written, as a stand-alone paper. Where NHS EED abstractors are able to identify positively that a
publication is significantly linked to or informed by other publications, these will be referenced in the text of the abstract and their bibliographic details recorded here for information.


**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
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