



Title **Clinical Effectiveness and Cost Effectiveness of Laparoscopic Surgery for Colorectal Cancer: Systematic Reviews and Economic Evaluation**

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www.hta.ac.uk/execsumm/summ1045.htm

Aim

To determine the clinical and cost effectiveness of laparoscopic, laparoscopically assisted (hereafter together described as laparoscopic surgery), and hand-assisted laparoscopic surgery (HALS) compared to open surgery in treating colorectal cancer.

Conclusions and results

A review of clinical effectiveness included 46 reports on 19 randomized controlled trials (RCTs) and 1 individual patient data (IPD) meta-analysis. The laparoscopic and open surgery trials included 2429 and 2139 participants, respectively. A systematic review of 4 papers suggested that laparoscopic surgery is more costly than open surgery. It showed a higher incremental cost per life-year, but was no more effective than open surgery. Data were sparse on incremental cost per QALY for laparoscopic versus open surgery. Results of the base-case analysis indicate a 40% chance that laparoscopic surgery is the more cost-effective intervention at a willingness-to-pay threshold of GBP 30 000 per QALY. A second analysis assuming equal mortality and disease-free survival found a 50% likelihood at a similar threshold value. Similar results were found in the sensitivity analyses. A threshold analysis examined the magnitude of QALY gain associated with quicker recovery after laparoscopic surgery required to provide an incremental cost per QALY of GBP 30 000. The implied number of additional QALYs required would be 0.009 to 0.010 compared with open surgery.

Recommendations

Laparoscopic resection showed faster recovery, but no difference in mortality or disease-free survival up to 3 years after surgery. However, operation times are longer, and many procedures initiated laparoscopically may need to be converted to open surgery. Conversion may depend on experience in patient selection and in using the technique. Laparoscopic resection appears to be more costly than open resection (about GBP 250 to GBP 300 per patient). In relative cost effectiveness, laparo-

scopic resection is associated with a modest additional cost, short-term benefits from faster recovery, and similar long-term outcomes in survival and cure rates up to 3 years. Assuming equivalence of long-term outcomes, a judgment is required as to whether the benefits of earlier recovery are worth the extra cost.

Methods

Electronic databases were searched from 2000 to May 2005. Data from selected studies were extracted and assessed. Dichotomous outcome data from individual trials were combined using the relative risk method, and continuous outcomes were combined using the Mantel-Haenszel weighted mean difference method. Results from individual patient data (IPD) meta-analyses were summarized. A Markov model incorporated data from the systematic review in an economic evaluation. A balance sheet compared surgical techniques and was used to estimate cost effectiveness in terms of incremental cost per life-year gained and per quality-adjusted life-year (QALY).

Further research/reviews required

Long-term followup of the RCT cohorts would be useful, and the data should be used in a wider IPD meta-analysis. Data on long-term complications of surgery and differences in outcomes would be valuable. New data on costs and utilities should be included in an updated model. Data are needed from methodologically sound RCTs. Possible variations in the balance of advantages and disadvantages of laparoscopic surgery in subgroups (different stages and locations of disease) should be studied. The effect of experience on performance also requires further research.