Laparoscopic cholecystectomy versus mini-laparotomy cholecystectomy: a meta-analysis of randomised control trials

CRD summary
This review concluded that operative and post-operative outcomes of elective laparoscopic and mini-open cholecystectomy appear similar in patients undergoing elective cholecystectomy for symptomatic gallstone disease, although the former was associated with a shorter hospital stay. The authors’ conclusions appear to be supported by the data presented, but their reliability is unclear given the poor reporting of review methods and study characteristics.

Authors' objectives
To compare operative and post-operative outcomes of elective laparoscopic (LC) versus mini-open cholecystectomy (MoC), in patients undergoing elective cholecystectomy for symptomatic gallstone disease.

Searching
MEDLINE (via PubMed), EMBASE, Ovid, the Cochrane CENTRAL Register and Google Scholar were searched from 1992 to 2005; the search terms were reported. The reference lists of retrieved articles were also checked. There were no language restrictions.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) were eligible for inclusion. Studies included in the meta-analysis were from Canada, Finland, Germany, the UK, Italy, India and Sweden.

Specific interventions included in the review
Studies that clearly documented comparisons of LC versus MoC were eligible for inclusion. It was required that MoC was clearly defined as being less invasive than traditional open cholecystectomy, but the definition of MoC varied in the included studies.

Participants included in the review
Patients undergoing elective cholecystectomy for symptomatic gallstone disease were eligible for inclusion. Studies had to clearly report the indications for surgery. Patient characteristics were not reported in the review.

Outcomes assessed in the review
It appears that studies reporting at least one of the following outcomes were eligible for inclusion: operative outcomes (e.g. blood loss and operative time), adverse events (abdominal and extra-abdominal complications) and functional outcomes (e.g. length of hospital stay and sick leave). Various outcomes from these categories were included.

How were decisions on the relevance of primary studies made?
The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
Study quality was assessed in terms of randomisation, double-blinding and drop-outs using the Jadad scale to obtain a quality score out of 5. Studies achieving 3 or more were deemed high quality. The authors did not state how the validity assessment was performed.

Data extraction
Two reviewers independently extracted the data. The way in which disagreements were resolved was not reported. Odds ratios were derived from the number of adverse events in each group, and means were calculated for continuous variables.
Methods of synthesis
How were the studies combined?
Pooled odds ratios and weighted mean differences (WMDs) were calculated, along with 95% confidence intervals (CIs), using a random-effects model. Funnel plots were used to assess publication bias.

How were differences between studies investigated?
Heterogeneity was assessed using the chi-squared statistic. Potential sources of heterogeneity were investigated in subgroup analyses: studies with more than 100 participants, studies described as high quality and studies published from 2000 onwards.

Results of the review
Nine RCTs (n=2,032) were included in the analysis.

Five of the 9 RCTs were described as high quality and had a Jadad score of 3 or more.

There was a statistically significant difference in operating time which was longer in the LC group than in the MoC group (difference 14.14 minutes, 95% CI: 2.08, 26.19, p<0.0001). Length of stay was statistically significantly shorter in the LC group compared with the MoC group (WMD -0.37 days, 95% CI: -0.53, -0.21, p<0.0001). For all other outcomes there was no statistically significant difference between treatment groups. No statistically significant heterogeneity was detected apart from for the assessments of conversion rate, abdominal complications and sick leave.

Subgroup analyses.

The difference in operative time was not statistically significant in studies that had been published from the year 2000 onwards. This subgroup also showed a statistically significant reduction in sick leave in the LC group. There were no statistically significant differences in length of stay or amount of sick leave in studies with more than 150 participants and in studies with a Jadad score of 3 or more.

Authors' conclusions
MoC and LC appear to have similar outcomes, although LC was associated with a shorter hospital stay.

CRD commentary
The review answered a clearly defined research question. The search included five relevant databases and articles of all languages, thereby reducing the risk of language bias. The authors searched the reference lists of papers identified but made no attempt to identify unpublished studies, which might have introduced publication bias. Although the authors reported that they assessed publication bias using funnel plots, the results of this were not shown and are unlikely to be reliable given the small number of included studies. The authors did not state how primary studies were selected or how the validity assessment was performed, so it is not known whether any steps were taken to minimise bias and error in these review processes. The validity of the primary studies was assessed using a suitable tool and potential sources of clinical heterogeneity were investigated. However, it is difficult to assess whether the studies were clinically similar since patient characteristics were not reported, although the authors did state that the variability in MoC definitions limited their findings. Overall, the authors' conclusions appear to be supported by the data presented, but their reliability is unclear given the poor reporting of review methods and study characteristics.

Implications of the review for practice and research
Practice: The authors stated that for those health care systems where the cost of setting up and maintaining a laparoscopic service are seen as prohibitive, or in those patients in whom laparoscopy is contraindicated, MoC offers an effective alternative, with similar patient outcomes.

Research: The authors stated that future studies should address comparative data concerning cost, cosmesis and quality of life.
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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.