Laparoscopic versus open hepatic resections for benign and malignant neoplasms: a meta-analysis


CRD summary
This review suggested that in patients with hepatic neoplasms, laparoscopy is associated with lower operative blood loss and shorter hospital stays compared with open surgery, and that the safety of these approaches seems comparable. The review had some methodological weaknesses and the available evidence was limited, therefore the conclusions may not be reliable.

Authors' objectives
To compare laparoscopy versus open surgery in patients with benign and malignant hepatic neoplasms.

Searching
MEDLINE, EMBASE and the Cochrane Library were searched up to 2005; the search terms were reported. No language restrictions were applied. The references of retrieved articles were checked for additional studies.

Study selection
Study designs of evaluations included in the review
Any comparative study was eligible for the review.

Specific interventions included in the review
Studies evaluating laparoscopy versus open surgery for liver neoplasms were eligible. Investigations on cyst excision, biopsy or non-anatomic resections were excluded.

Participants included in the review
Studies of patients undergoing hepatic resections for benign or malignant neoplasms were eligible. The mean age of the participants in the included studies ranged from 47 to 68 years, where reported.

Outcomes assessed in the review
The outcomes evaluated were operative time, operative blood loss, number of patients requiring blood transfusions, use and duration of portal triad clamping, clearance of the hepatic tumour, time to first oral intake, duration of post-operative hospital stay, and early and long-term post-operative adverse events including survival and recurrence-free survival.

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. For studies published by the same institution, the highest quality or most recent reports were selected.

Assessment of study quality
Study quality was evaluated on the basis of patient selection, comparability of the study groups and outcome assessment, using the Newcastle-Ottawa Scale. This assigns a number of stars for each quality item; high-quality studies were those with 6 or more stars out of a maximum of 10. The authors did not state how many reviewers performed the quality assessment.

Data extraction
Two independent reviewers performed the data extraction; the authors stated that there was no disagreement between them.

Methods of synthesis
How were the studies combined?
Pooled odds ratios were calculated for dichotomous variables and the weighted mean difference (WMD) for continuous variables, along with their respective 95% confidence intervals (CIs). The Mantel-Haenszel random-effects model was used to obtain pooled ORs; the Yale correction was used for studies reporting no events.

How were differences between studies investigated?
Statistical heterogeneity was assessed but the methods used were not reported. Sensitivity analyses were conducted for studies of higher quality, studies published in or after 2003, studies including more than 20 laparoscopic resections, and studies matched for the presence of malignancy or segment resection. The authors stated that a funnel plot was used to assess the potential for publication bias.

Results of the review
Eight non-randomised studies (403 patients undergoing 409 resections) were included in the review.

Five studies were judged to be high quality. Five studies matched patients (one with prospective and the others with retrospective data collection in the open surgery group).

Compared with open surgery, laparoscopy was associated with a significant reduction in operative blood loss (WMD -123 mL, 95% CI: -179, -67, p<0.001), duration of hospital stay (WMD -2.6 days, 95% CI: -3.8, -1.4, p<0.001) and time to first oral intake (WMD -0.5 days, 95% CI: -1.0, 0, p=0.05); there was evidence of statistical heterogeneity for the latter outcome (p=0.04). All four studies that assessed the adequacy of oncological clearance reported no significant difference between treatment groups. Two studies suggested a lower use of post-operative analgesia in patients receiving laparoscopy. The portal triad clamping was longer with the laparoscopic approach (WMD 28 minutes, 95% CI: 2, 55, p=0.03). The incidence of the other evaluated outcomes and adverse events seemed comparable between the two study groups. Conversion to open surgery was reported in 6 cases (3.7%). Sensitivity analysis did not influence these findings.

Authors' conclusions
Compared with open surgery, laparoscopic resection reduces operative blood loss and shortens hospital stay while achieving comparable tumour clearance. The laparoscopic approach may be a safe and feasible option when performed by experienced surgeons in selected patients.

CRD commentary
This review addressed a well-defined question in terms of the participants, interventions and study outcomes, while broad criteria were used for study design. Two databases and a trial register were searched, and efforts were made to find further information by reviewing reference lists. No language restrictions were applied, thereby limiting the potential for language bias. The authors attempted to minimise bias and errors during the review process, by carrying out the data extraction in duplicate. It is unclear if the study selection and quality assessment were also performed in duplicate, therefore reviewer error and bias might have been introduced at these stages.

Statistical heterogeneity was evaluated and not found for most of the outcomes considered; this supports the authors’ decision to pool the studies in a meta-analysis. The authors’ conclusions need to be interpreted with caution given the methodological weaknesses of the review and the fact that they are based on a small number of poor-quality studies with few participants.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that randomised controlled trials are needed to confirm the efficacy and safety of laparoscopy and to assess long-term survival rates.
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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.