Single-incision versus conventional laparoscopic cholecystectomy: a systematic review of available data


CRD summary
The review concluded that single-incision laparoscopic cholecystectomy was a safe and feasible approach compared with conventional laparoscopic cholecystectomy in patients with benign gallbladder lesions requiring removal. The unclear quality of the evidence base and high levels of statistical heterogeneity limit the reliability of the authors’ conclusions.

Authors’ objectives
To evaluate the feasibility and limitations of single-incision laparoscopic cholecystectomy compared with conventional laparoscopic cholecystectomy in patients with benign gallbladder lesions requiring removal.

Searching
EMBASE and PubMed were searched to January 2011. Search terms were reported. References of included studies and two of the most widely used Chinese databases were searched.

Study selection
Prospective or retrospective studies of single-incision laparoscopic cholecystectomy versus conventional laparoscopic cholecystectomy in patients with benign gallbladder lesions requiring removal were eligible for inclusion. Studies had to have a minimum of 10 patients in each group. The relevant primary outcomes were blood loss, operating time, conversion rate and complications. Various secondary outcomes were considered. Patients with malignant gallbladder lesions were excluded. Reviews and case studies were excluded.

The included studies considered patients with chronic cholecystitis, cholelithiasis or gallbladder polyps. Acute cholecystitis was included in more than half of the studies. A wide variation of single-incision laparoscopic cholecystectomy techniques was applied in the studies. The number of trocars ranged from one to three and types of trocar included both 5mm and 10mm. Where reported, the mean age of patients ranged from 37 to 51 years and the mean body mass index ranged from 23 to 31kg/m².

Two reviewers independently undertook study selection. Disagreements were resolved by discussion.

Assessment of study quality
The authors did not state whether they assessed study quality.

Data extraction
Data were extracted on primary and secondary outcomes and used to calculate odds ratios for dichotomous data and mean differences for continuous data, together with 95% confidence intervals (CI).

The authors did not state how many reviewers extracted these data.

Methods of synthesis
Fixed-effect meta-analysis was used to calculate pooled odds ratios and weighted mean differences, together with 95% CIs. Random-effects meta-analysis was used where there was evidence of statistical heterogeneity. I² was used to assess statistical heterogeneity.

Results of the review
Eleven studies were included in the review (912 patients, size range 35 to 200): eight studies in English and three in Chinese. Where stated, follow-up ranged from three days to three months.

Compared with conventional laparoscopic cholecystectomy, single-incision laparoscopic cholecystectomy was
associated with a statistically significant longer operating time (mean difference 18.54 minutes, 95% CI 9.20 to 27.88; \(I^2=83\%\); eight studies). There was no statistically significant difference in length of hospital stay (\(I^2=97\%\); three studies), overall complications (\(I^2=0\%\); five studies) and severe complications (\(I^2=89\%\); seven studies).

**Authors’ conclusions**

Single-incision laparoscopic cholecystectomy was a safe and feasible approach compared with conventional laparoscopic cholecystectomy in patients with benign gallbladder lesions requiring removal.

**CRD commentary**

Inclusion criteria for the review were defined. Several relevant data sources were searched. Attempts were made to reduce reviewer error and bias during study selection but it was not clear that the same attempts were made for data extraction. There did not appear to be a quality assessment but the authors stated that most of the included studies were observational and poor quality.

Random-effects meta-analysis was used to pool data even though high levels of statistical heterogeneity indicated that the data may not have been suitable for pooling. This meant that the pooled values based on the diverse estimates were not very meaningful. The authors noted a large amount of variability in techniques used in studies; this variation may have contributed to the high levels of heterogeneity. The authors noted that a learning curve effect was observed with single-incision laparoscopic cholecystectomy.

The unclear quality of the evidence base and high levels of statistical heterogeneity limit the reliability of the authors’ conclusions.

**Implications of the review for practice and research**

**Practice:** The authors stated that single-incision laparoscopic cholecystectomy may be offered as an alternative for cholecystectomy in carefully selected patients. The authors noted that although single-incision laparoscopic cholecystectomy may be associated with a longer operating time for most beginners, as the surgeons become more experienced duration decreased to a level comparable with the conventional procedure.

**Research:** The authors stated that as most of the included studies were observational and poor quality more convincing data from multicentre prospective randomised controlled trials were needed.

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