Single incision laparoscopic cholecystectomy is associated with a higher bile duct injury rate: a review and a word of caution

CRD summary
The authors concluded that there seemed to be an increase in the rate of bile duct injuries during single incision laparoscopic cholecystectomy compared with historically reported rates for standard laparoscopic cholecystectomy. Limitations in some of the systematic review methodology and the unknown design and quality of the included studies mean that the reliability of the results is unknown.

Authors' objectives
To evaluate the incidence of bile duct injuries during single incision laparoscopic cholecystectomy (SILC) and compare these results with published rates for standard laparoscopic cholecystectomy.

Searching
PubMed, EMBASE and CINAHL were searched from January 1990 to February 2011 for publications in English; search terms were provided. There was a manual search of references of all retrieved articles.

Study selection
Studies that evaluated single incision laparoscopic cholecystectomy (SILC) and included at least 20 patients were included in the review. Primary outcomes of interest were perioperative variables including morbidity, mortality and bile duct injuries.

In the included studies, 72% of the patients were female, median age was 45 years and median body mass index (BMI) was 27kg/m². Only 9.4% of patients had acute cholecystitis. Median operation length was 71 minutes. Bile duct injuries in each study were categorised according to the Strasberg Bile Duct Injury Classification System and 58% were categorised as type A. Surgical complications were graded according to the Clavien-Dindo Classification of Surgical Complications System. It appeared that all the included studies were retrospective and non-controlled. Studies were published between 1997 and 2011.

The authors did not state how many reviewers selected studies for inclusion.

Assessment of study quality
The authors stated that each paper was critically reviewed using a standard protocol but did not report further details.

Data extraction
Data on outcomes were extracted in order to perform t tests for continuous operative variables and $\chi^2$ tests for categorical variables.

The authors did not state how many reviewers performed data extraction.

Methods of synthesis
The results were presented as a narrative synthesis; the authors stated that these data were not amenable to meta-analysis.

Results of the review
Forty-five studies (2,626 patients, range 20 to 297) were included in the review.

There were 19 bile duct injuries at an injury rate of 0.72% (the historical rate for standard laparoscopic cholecystectomy was 0.4% to 0.5%). The gallbladder retraction method, commercial device utilisation, number of ports/trocars used and length of surgery were not associated with the rate of bile duct injuries.

Overall complication rate was 4.2%. The number of complications and presence of acute cholecystitis were not
associated with the rate of bile duct injuries.

Data on mortality were not reported.

**Authors' conclusions**
There seemed to be an increase in the rate of bile duct injuries during SILC compared with historically reported rates for standard laparoscopic cholecystectomy.

**CRD commentary**
The review question was clear and supported by broad inclusion criteria. The authors searched several relevant databases and handsearched articles. The restriction to studies published in English introduced potential for language and publication biases. It was unclear whether study selection and data extraction were carried out with sufficient attempts to minimise reviewer error and bias. The authors stated that each paper was critically reviewed using a standard protocol but did not report further details. Some study characteristics were reported, but there was no information on study design. A narrative synthesis was suitable given the clinical diversity between the studies and the comparison of SILC with retrospective data from other studies.

Limitations in some of the systematic review methodology and the unknown design and quality of the included studies mean that the reliability of the results is unknown.

**Implications of the review for practice and research**
**Practice:** The authors stated that the surgical community should be cautious not to repeat the mistakes that occurred during the dissemination phase of laparoscopic surgery given that no distinct benefit of SILC over standard laparoscopic cholecystectomy had been identified (with the possible exception of cosmesis). The authors also stated that because most SILCs were performed in optimal conditions (such as a lack of acute inflammation) caution was needed in applying this technique to inflamed gallbladder pathology.

**Research:** The authors stated that their findings need to be confirmed with large-scale controlled studies.

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