

Single-incision laparoscopic cholecystectomy: a systematic review

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Article Overview

A trend toward even more minimally invasive laparoscopic approaches has led to techniques of single-incision and natural orifice laparoscopic surgery. This article is a systematic review of the literature which examines the feasibility, safety, and results of single-incision laparoscopic cholecystectomy (SILC), and defines, if possible, the limitations of this technique.

Methods

A literature search confined to studies published in English and German was performed using the electronic database of Medline through mid-February 2010. Studies were considered for inclusion provided the following criteria were fulfilled: (1) The study included ten or more patients who underwent SILC, (2) No additional incisions besides the umbilical were performed, (3) Analytical conversion and complication data were reported.

Data from 29 studies with 1,166 patients were reviewed. The chi-square test (χ^2) was used to evaluate the differences in success and complication rates according to demographic and operative study data.

Discussion Related to Literature Review

1. The statistical analysis indicated significantly lower complication rates for studies enrolling patients with a mean age lower than 45 years ($p = 0.04$), whereas no difference in morbidity and success rates was noted with regard to sex distribution and mean BMI.
2. Suture suspension of the gallbladder yielded significantly lower complication rates compared with instrument usage (**3.3 vs. 13.3%**, $p < 0.0001$).
3. Reported **2.6%** inadequate exposure of the Calot's triangle due to insufficient gallbladder retraction.
4. Technical challenges of SILC include:
 - Retraction of the gallbladder and exposure of the Calot's triangle
 - Clashing of the instruments
 - Inadequate length of the instrumentation
 - "Mirror-Effect" concerning the handling of roticulating instruments
5. Many surgeons noted discomfort using roticulating instruments, because the right hand operates the left-sided instrument at the site of the gallbladder and vice versa.

Conclusion

The efficacy of SILC is adequately studied as indicated by the volume of articles reporting on the success of the technique; evaluation of its safety is a matter of time. Until the results of the procedure are well established, cases of acute cholecystitis and older patients should be approached with caution. **Furthermore, retraction instruments seem to be insufficient for the single-incision approach.**



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