Meta-analysis of skin adhesives versus sutures in closure of laparoscopic port-site wounds
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CRD summary
This review found insufficient evidence to determine the effects of adhesives and sutures for port-site wound closure on infection, dehiscence and patient satisfaction, although adhesives were faster to apply. These conclusions reflected the paucity and poor quality of data, but findings regarding the speed of wound closure may not be reliable given clinical and statistical differences between the studies.

Authors' objectives
To assess the clinical effectiveness of skin adhesives versus sutures for closure of laparoscopic port-site wounds.

Searching
MEDLINE via PubMed, EMBASE, CINAHL and The Cochrane Library were searched from January 1959 to August 2008. Search terms were reported. Reference lists of retrieved articles were searched for additional studies and further studies traced using the related function facility. No language restrictions were applied.

Study selection
Randomised controlled trials (RCTs) that compared sutures with skin adhesives for closure of laparoscopic trocar or port-site wounds in any patient were eligible for inclusion in the review. No inclusion criteria were specified for the types of eligible outcomes.

Included studies assessed the following types of glue: n-butyl-cyanoacrylate, octyl cyanoacrylate and 2-octyl-cyanoacrylate. Suture materials included: polyamide, polyglactin 910 or poliglecaprone 25 and 3/0 polydioxanone. Skin suturing techniques were not clearly mentioned in most of the trials; subcuticular technique was used in all trials except one. It was not stated whether trials used continuous or interrupted subcuticular techniques. All ports were closed only by sutures or skin adhesives with the exception of one trial where Steri-Strips were used after subcuticular suture closure. Half of the trials included hepatobiliary patients, 25% urology patients and 25% a mixture of hepatobiliary and urology patients. Reported outcomes were wound infection, wound dehiscence, speed of wound closure and patient satisfaction. Follow-up in the trials ranged from 14 to 90 days. All of the trials were published between 2003 and 2006.

Two reviewers independently assessed each article for inclusion.

Assessment of study quality
Study quality was assessed according to the following criteria: inclusion criteria; exclusion criteria; method of randomisation; sample size calculation; baseline comparability of study arms; use of blinding; extent of crossover; loss to follow-up; use of concealment of allocation; and use of an intention-to-treat analysis. Each study was graded as stated or not stated for each criterion.

The authors did not state how many reviewers performed the assessment.

Data extraction
Two researchers independently extracted study data, which was then checked by a third reviewer. For continuous data (such as closure time), mean differences with standard deviations were extracted and used to calculate the Hedges g statistic. Where standard deviations were not reported they were estimated either from ranges or p values. For dichotomous data (such as wound infection, wound dehiscence and satisfaction) risk ratios (RR) with 95% confidence intervals (CIs) were calculated.

Methods of synthesis
Studies were grouped according to outcome. Continuous outcomes were pooled using both a fixed-effect, inverse variance model and a random-effects model (DerSimonian and Laird) and standardised mean differences (SMD) with
95% CIs were calculated. Dichotomous outcomes were pooled using both the Mantel–Haenszel fixed-effect model and the DerSimonian and Laird random-effects model and pooled RRs with 95% CIs calculated. A sensitivity analysis was performed for dichotomous outcomes by adding 0.5 to each cell frequency in studies where one of more study arms experienced no events. Statistical heterogeneity was assessed using the Q statistic. The authors reported that publication bias was difficult to assess due to the small numbers of studies included in the review.

**Results of the review**

Four RCTs (n=404) were included in the review. Allocation concealment, intention-to-treat analysis and blinding of investigator/assessor were poorly reported in the studies. Overall, the methodological quality of the studies was considered to be inadequate.

In both fixed-effect and random-effects models, there was no statistically significant difference between skin adhesives and sutures for port-site wound closure in terms of wound infection (four RCTs), wound dehiscence (four RCTs) and patient satisfaction (two RCTs); no statistically significant heterogeneity was reported for any of the analyses.

Tissue adhesives were statistically quicker to use than sutures (fixed-effects SMD -1.66 seconds, 95% CI -1.90 to -1.43 and random effects SMD -2.13 seconds, 95% CI -3.27 to -1.00; four RCTs); this finding was associated with significant statistical heterogeneity (Q = 59.09, df = 3, p<0.000).

**Authors’ conclusions**

There was insufficient evidence to determine whether adhesives or traditional sutures were better for port-site wound closure in terms of wound infection, wound dehiscence and patient satisfaction; tissue adhesives appeared faster to apply.

**CRD commentary**

This review assessed a clear research question. Inclusion/exclusion criteria for outcomes were not defined. A number of electronic databases were searched for relevant data without any restrictions on language. No specific attempts were made to locate unpublished studies and so there was some risk of publication bias. Risk of reviewer error and bias appeared to be low as more than one reviewer assessed the studies for inclusion and extracted the study data; it was unclear whether similar precautions were taken when assessing the methodological quality of the studies. Only four studies were included in the review and the overall quality of the studies was described as inadequate, which suggested that data may not have been reliable. The studies varied with respect to the type of sutures and skin adhesives used, which suggested that it may not always have been appropriate to pool data from different studies. But, statistical heterogeneity was low with the exception of an outcome found to be statistically different between the two treatment groups. Overall, the authors’ conclusions reflected the paucity and poor quality of the data, but findings regarding the speed of wound closure may not be reliable given clinical and statistical differences between the studies.

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

**Practice:** The authors stated that based on this review there was insufficient evidence to determine if port-site wound closure technique by tissue adhesives was superior to traditional suture closure technique.

**Research:** The authors stated that a large multicentre randomised controlled trial that compared tissue adhesives with sutures for port-site wound closure was required.

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**Bibliographic details**


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Record Status
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.