Efficacy of closed suction drainage in lower limb arterial surgery: a meta-analysis of published clinical trials


CRD summary
This review of closed suction drainage following surgical lower limb revascularisation concluded there was no clear evidence that closed suction drainage reduced wound infection, haematoma, seroma or lymphocele formation. However, the small number of studies, small sample sizes, possible methodological heterogeneity and lack of information on data extraction and validity assessment may limit the validity of the conclusions.

Authors' objectives
To undertake a systematic review and meta-analysis to determine the role of closed suction drainage following surgical lower limb revascularisation.

Searching
MEDLINE and EMBASE were searched from 1966 until 2007. Search terms were reported. Conference proceedings, Current Controlled Trials Register, Cochrane Database of Controlled Trials and reference lists were also searched.

Study selection
Studies were included if they met each of the following criteria: randomised controlled trial; patients undergoing groin incision for arterial surgery; and randomisation to groups with or without drain insertion. The primary outcomes were wound infection, seroma/lymphocele formation and haematoma formation (included studies used different definitions for these outcomes).

There were 228 bypasses (aorto-bifemoral, infrainguinal), 78 local femoral arterial procedures (femoro-femoro crossover, embolectomy, endarterectomy) and 17 miscellaneous procedures (profundaplasty, extra-anatomical bypass). Some procedures generated more than one wound. Both prosthetic material and vein graft procedures were included.

Identified citations were assessed by two reviewers to determine eligibility for inclusion in the meta-analysis. It was unclear how discrepancies were resolved.

Assessment of study quality
The quality of each trial was assessed using the Jadad scoring system (1 to 5). The authors stated neither how many reviewers performed the quality assessment nor how any differences were resolved.

Data extraction
The authors stated neither how the data were extracted for the review nor how many reviewers performed the data extraction.

Methods of synthesis
For each outcome, a pooled odds ratio was calculated using the random-effects models described by DerSimonian and Laird. Heterogeneity was assessed by Cochran’s Q statistic, where a P value < 0.05 was taken as significant heterogeneity. The Egger test was used to assess the funnel plot for significant asymmetry, which may indicate publication or other biases.

Results of the review
Four trials (n=429 wounds; 209 with drainage) were eligible for inclusion. The number of participants ranged from 96 to 127. Three studies received a Jadad score of 2 and the other a score of 3.

There was no statistical difference between patients with a drain and those without in the risk of wound infection (three trials). The pooled odds ratio for this outcome in the meta-analysis plot was 1.04 (95% CI 0.56, 1.91; p = 0.94),
although it was reported as 1.56 in the text.

There was no statistical difference between groups for the outcomes of haematoma formation (three trials, odds ratio of 2.01, 95% CI 0.42, 9.93; p = 0.38) or seroma and lymphocele formation (four trials, pooled odds ratio 0.62, 95% CI 0.37, 1.04; p = 0.07).

There was no evidence of statistical heterogeneity between studies for any of the outcomes, but the authors stated that apparent methodological heterogeneity between studies may have influenced the meta-analytic results. There was evidence of publication bias for seroma/lymphocele formation (p = 0.02), but not for wound infection. There were too few studies to assess publication bias for haematoma formation.

**Authors’ conclusions**
The available data demonstrated no clear benefit of closed suction drainage in terms of reducing rates of wound infection, haematoma, seroma or lymphocele formation following lower limb arterial surgery.

**CRD commentary**
The review question and inclusion criteria were clear. The search strategy appeared comprehensive. Validity was assessed using a reliable tool, but the process for data extraction and validity assessment were not reported and reviewer error and bias could not be ruled out. Appropriate methods were used to investigate statistical heterogeneity and publication bias; publication bias was reported for one outcome. Although there was no evidence of statistical heterogeneity, there was potential for methodological heterogeneity. In addition, the number of included studies and numbers of participants in the studies were small. Given the above considerations, it was difficult to determine the reliability of the authors’ conclusions and they should be interpreted with caution.

**Implications of the review for practice and research**
Practice: The authors stated that the available data did not support the routine use of closed suction drains following lower limb revascularisation.

Research: The authors stated that a far greater amount of data was needed to clarify any trends in postoperative complications that may support the use of drains.

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