Prophylactic subcutaneous drainage for prevention of wound complications after cesarean delivery: a metaanalysis

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CRD summary
The authors concluded that the use of prophylactic subcutaneous drainage was not associated with a significant reduction in wound complications in women undergoing Caesarean section. The data appear to support the authors’ conclusion, but it is difficult to assess its reliability given the inadequate reporting of review methods and an inadequate quality assessment of the included studies.

Authors’ objectives
To evaluate the effectiveness of subcutaneous drainage in preventing wound complications in women undergoing Caesarean delivery.

Searching
PubMed, MEDLINE, CINAHL, EMBASE, ACP Journal Club, OCLC, the Cochrane Library, DARE, Web of Science and Scopus were searched from inception to March 2006; the search terms were reported. No language restrictions were applied. In addition, reference lists of relevant studies and published proceedings of three named societies (1996/7 to 2006) were screened.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) were eligible for inclusion in the review.

Specific interventions included in the review
Studies that evaluated the prophylactic use of subcutaneous drains were eligible for inclusion. Studies that used concurrent subfascial drains were excluded. Half of the included studies were conducted in the USA, and all but one study were set in a training hospital with resident house staff. All but one study used pre-operative antibiotics. Subcutaneous drains were left in situ for between 6 and 72 hours. All but one study compared subcutaneous drainage with no drain or no subcutaneous approximation; one study in higher risk women compared suture closure plus drainage with subcutaneous closure alone.

Participants included in the review
Studies of women undergoing Caesarean delivery were eligible for inclusion. In all but one of the included studies, patients had a minimum subcutaneous thickness of 2 cm; one study only included higher risk women with a minimum subcutaneous thickness of 4 cm.

Outcomes assessed in the review
Inclusion criteria were not specified in terms of the interventions, but it was clear that the review focused on wound complications. The primary review outcomes were wound separation or disruption, wound infection, wound haematoma and wound seroma. The definitions used for outcomes in the included studies were reported.

How were decisions on the relevance of primary studies made?
Three reviewers selected the studies. Any disagreements were resolved by consensus.

Assessment of study quality
The authors did not state that they assessed validity. However, use of intention-to-treat analysis was reported.

Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction. Authors of studies reported as abstracts or studies with missing data were contacted for additional
Methods of synthesis
How were the studies combined?
Pooled odds ratios (ORs) with 95% confidence intervals (CIs) were calculated using the fixed-effect Mantel-Haenszel model. Random-effect models were used where significant heterogeneity (p<0.05) was detected.

How were differences between studies investigated?
Statistical heterogeneity was assessed using the chi-squared statistic. Analyses were repeated after excluding one study in high-risk women that compared suture closure plus drainage with subcutaneous closure alone.

Results of the review
Six RCTs (n=1,066) were included.

Four studies were defined as using intention-to-treat analysis.

There was no significant difference between patients in the subcutaneous drainage group compared with the no drainage group for wound disruption (OR 0.74, 95% CI: 0.39, 1.42, p=0.36; 6 studies), infection (OR 1.15, 95% CI: 0.70, 1.90, p=0.58; 6 studies), haematoma (OR 1.05, 95% CI: 0.33, 3.30, p=0.94; 4 studies) or seroma (OR 0.44, 95% CI: 0.14, 1.43, p=0.17; 4 studies). Significant heterogeneity (p<0.05) was found for analyses of wound disruption and seroma; random-effects models were used for these analyses.

Analysis limited to studies that compared drainage with no drainage showed a significant reduction in the risk of seroma formation with subcutaneous drainage (OR 0.28, 95% CI: 0.11, 0.74, p=0.01; 3 studies), but no significant difference between treatments for other outcomes.

Authors’ conclusions
Use of prophylactic subcutaneous drainage was not associated with a significant reduction in wound complications in women undergoing Caesarean section.

CRD commentary
The review question was clear with respect to the participants, intervention, outcomes and study design. Several relevant sources were searched, no language restrictions were applied, and studies reported as abstracts were eligible. However, no specific attempts to identify unpublished studies were reported. Methods were used to minimise reviewer error and bias at the study selection stage, but it was unclear whether similar steps were taken when extracting the data. Although only RCTs were included and intention-to-treat analysis was reported, no other aspects of validity were reported and so the results from these studies and any synthesis might not be reliable.

Statistical heterogeneity was assessed and the studies were pooled using meta-analysis, despite significant heterogeneity being detected. Analyses were repeated after excluding one study that differed clinically from the others, but it was not reported if these additional analyses reduced the observed heterogeneity. The data appear to support the authors’ conclusion, but inadequate reporting of review methods and an inadequate quality assessment of the included studies mean it is difficult to assess its reliability.

Implications of the review for practice and research
Practice: The authors stated that it is difficult to justify the prophylactic use of subcutaneous drains in women undergoing Caesarean delivery.

Research: The authors stated that it is important to identify other interventions that reduce wound complications in women undergoing Caesarean section.

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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.