Omission of the bladder flap at caesarean section reduces delivery time without increased morbidity: a meta-analysis of randomised controlled trials

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CRD summary
The validity of the authors' conclusion that the routine creation of a bladder flap did not seem to improve perioperative outcomes, for women undergoing elective caesarean delivery, remains unclear; it should be interpreted with caution due to limitations in the review. Their conclusion that its role remained unclear for women undergoing preterm and emergency surgery was appropriate.

Authors' objectives
To examine the benefit of bladder flap formation in caesarean section.

Searching
Five databases, including MEDLINE and EMBASE, were searched up to March 2012; search terms were reported. Reference lists of eligible studies and clinical trial registers were searched. No language restrictions were applied.

Study selection
Randomised controlled trials (RCTs) that compared the formation versus no formation of a bladder flap during caesarean section, in women aged 18 years or older, were eligible. The primary outcome of interest was iatrogenic bladder injury during surgery. The secondary outcomes were skin incision-to-delivery time, total operating time, estimated blood loss, and time in hospital.

The included trials were conducted in Austria, Italy or the USA. Two trials only included women who had primary caesarean section, and the other two included women who had primary or repeat caesarean section. Gestational age ranged from over 27 weeks to 38 weeks or more.

Two reviewers independently assessed the studies for inclusion.

Assessment of study quality
The quality of the selected trials was assessed according to the five-point Jadad scale (0 weakest and 5 strongest), covering the randomisation methods, blinding, and description of withdrawals and drop-outs.

It was not clear how many reviewers performed this assessment.

Data extraction
The data were extracted to calculate odds ratios and mean differences, with their 95% confidence intervals. Trial authors were contacted for additional information. The data were extracted and checked by two reviewers.

Methods of synthesis
A random-effects model was used to pool the trial data and calculate weighted mean differences and odds ratios, with 95% confidence intervals. Heterogeneity was assessed using Cochran's Q and $I^2$. A Cochran's Q probability of less than 0.05, or an $I^2$ greater or equal to 50%, was considered evidence of heterogeneity. Publication bias was assessed using Egger's test and in a funnel plot.

Results of the review
Four RCTs were included in the review (581 women). Two were rated 1 and 2 on the Jadad, and the other two were rated 3.

The meta-analysis showed that bladder flap formation was associated with a longer incision to delivery time (WMD 1.27 minutes, 95% CI 0.63 to 1.92; $I^2=35.9$).

No significant differences were found between groups with or without bladder flap for bladder injury (three RCTs;
I²=0), total operating time (four RCTs; I²=82.9%), blood loss (three RCTs; I²=96%) and time in hospital (two RCTs; no heterogeneity).

There were insufficient trials to construct a funnel plot or Egger's test for bladder injury, skin incision to delivery time, blood loss and duration of hospitalisation. Publication bias was observed for the total operation time.

**Authors' conclusions**
In women undergoing elective caesarean delivery, the routine creation of a bladder flap did not seem to improve perioperative outcomes, and could lengthen the incision-to-delivery time. For women undergoing very preterm and emergency intrapartum caesarean section, its role remained unclear.

**CRD commentary**
The review question and inclusion criteria were clear. Relevant sources were searched, with no language restrictions, and efforts were made to locate unpublished data, reducing the potential for language and publication bias. Publication bias was assessed for one outcome, and this suggested the presence of bias, but assessing so few trials may not be informative.

Appropriate methods were used to reduce the risk of reviewer error and bias in study selection and data extraction, but it was unclear whether similar methods were used for quality assessment. An appropriate quality assessment tool was used, but the full results were not reported. The overall quality scores indicated that half the trials were of poor quality. Appropriate methods were used to pool the data and assess heterogeneity. The authors stated that the various surgical techniques for omitting bladder flap formation, during caesarean section, could influence the outcomes of their review.

The authors acknowledged the limitations of their review, such as poor quality trials, small samples, and clinical and statistical variation between trials. The validity of their conclusion for routine surgery remains unclear and it should be interpreted with caution.

**Implications of the review for practice and research**
**Practice:** The authors stated that the safety of omitting formation of the bladder flap in women undergoing very preterm and emergency intrapartum caesarean section remained unclear and caution was warranted.

**Research:** The authors stated that further study was needed to assess the effects of bladder flap formation in women undergoing preterm caesarean section, and in women undergoing emergency caesarean section. The long-term effects, such as operative morbidity, healing and integrity of the uterine scar, effect on adhesions, and incidence of placenta accreta, needed assessment.

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