

OPINION

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## A New Method for Creating the Bladder Flap

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### Abstract

**Background:** Bladder flaps are commonly created during routine cesarean deliveries and often require multiple steps that increase operating time and expose the surgeon to inadvertent injury.

**Objective:** We report a simple method of creating a bladder flap that eliminates the need for multiple instrument handoffs and repositioning.

**Conclusion:** The simplicity of this method allows the surgeon decreased operative entry time while decreasing exposure to injuries from multiple instrument handoffs during bladder flap development.

**Keywords:** cesarean, obstetrics, dissection, lower uterine segment, serosa

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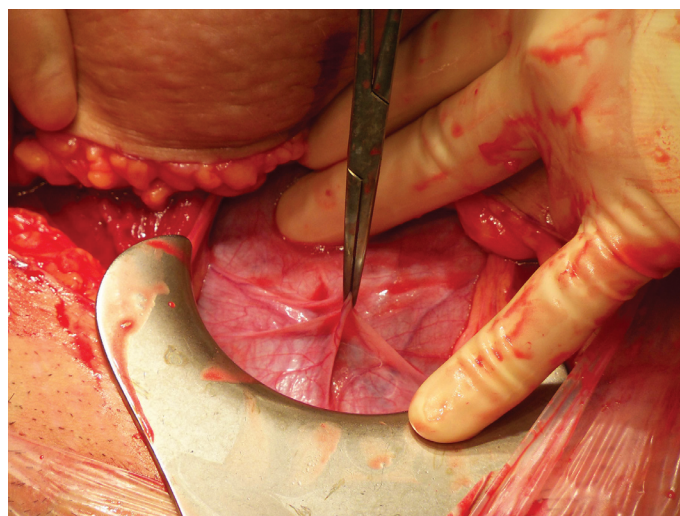
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## Introduction

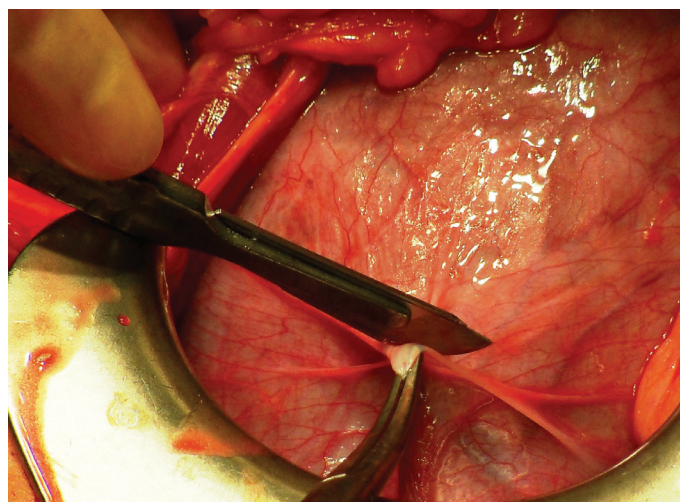
The creation of a bladder flap is a routine step during cesarean delivery. Despite the description of a cesarean technique to eliminate “unnecessary” steps during routine cesareans,<sup>1</sup> obstetricians continue to create bladder flaps on a routine basis. Pelosi and Ortega have described a technique that eliminates dissection of the rectus muscles from the overlying fascia, dispenses with bladder flap creation, and advises closure of the hysterotomy defect in one layer.<sup>1</sup> Wood et al found decreased blood loss, operative time, and overall cost when using the Pelosi-Ortega method (n = 101) compared with the standard Yale method (n = 174) of cesarean delivery.<sup>2</sup> Their report, however, did not address the omission of the bladder flap as a single modification. Two years later, a randomized, prospective trial compared the results of women who had no bladder flap formation (n = 53) prior to uterine incision with those who did have bladder flap formation (n = 49).<sup>3</sup> The results were similar to those reported by Wood et al, indicating a reduction in operating time, blood loss, and time from incision to delivery in the group with no bladder flap formation. In 2009, a 25-year retrospective review of 7708 cesarean deliveries found 34 cases of bladder injury, 20 that had occurred during a repeat cesarean (12/20 at time of bladder flap creation) and 14 that had occurred at the time of primary cesarean (7/14 during bladder flap creation). Prior pelvic surgery and adhesions were highly associated with bladder injuries as well. The overall incidence of bladder injury for the primary cesarean group was 0.27% (0.13% during separation of bladder flap) and 0.81% for the repeat cesarean group (0.49%).<sup>4</sup> All bladder injuries were identified at the time of cesarean, and all but one healed after primary repair. We describe a technique currently performed at a private hospital in Phoenix, Arizona, that performs approximately 5000 deliveries per year that could further reduce such injuries at the time of bladder flap creation.

## Technique

Upon entry into the peritoneal cavity, the lower uterine segment is identified. The superior aspect of the serosal bladder reflection is grasped with a Kelly clamp or similar instrument. Using gentle traction, a sagittal fold of serosa is created (Fig. 1). The fold is then incised in a transverse fashion with a scalpel, superior to the tip of the clamp (Fig. 2). The serosal



**Figure 1.** Blunt, grasping instrument used to elevate serosal margin of the lower uterine segment.

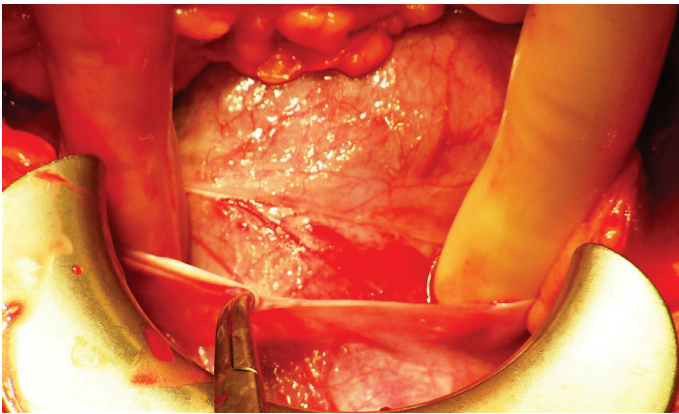


**Figure 2.** Incision of serosal fold superior to surgical instrument.

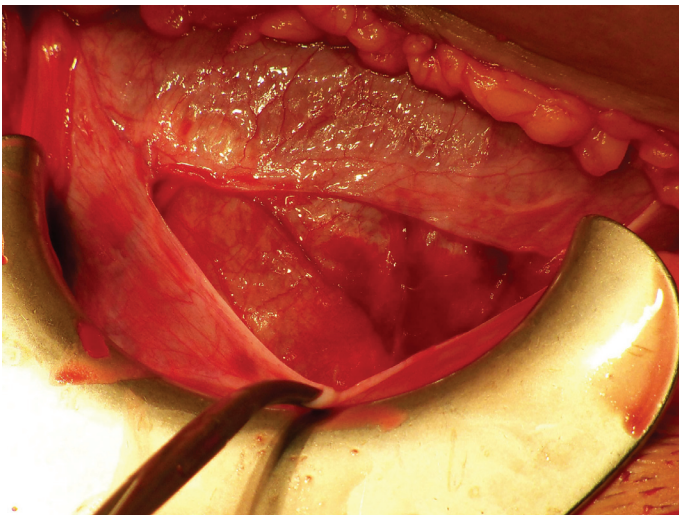
incision is 1 to 2 cm in length, or just wide enough to allow 2 fingertips into the opening. This open tissue plane is then extended laterally via blunt dissection (Fig. 3). While keeping the Kelly clamp attached to the inferior free edge of the bladder flap, a bladder blade is inserted into the newly created vesicouterine space, thereby exposing the denuded lower uterine segment (Fig. 4).

## Discussion

A recent randomized controlled trial of 259 women undergoing a primary or repeat cesarean at greater than 32 weeks' gestation compared creation (n = 132) with omission (n = 127) of bladder flaps, with the



**Figure 3.** Lateral, blunt dissection of the serosal opening.



**Figure 4.** Surgical instrument on the inferior border of bladder flap, awaiting insertion of bladder blade in exposed serosal opening.

primary goal of evaluating the difference in operative time between the 2 groups.<sup>5</sup> There was no statistical significance in the total operative time, but a significantly shorter time from incision to delivery of the infant was noted in the group in which bladder flap creation was omitted. The 2 groups showed no significant differences in estimated blood loss, postoperative microhematuria, postoperative pain, total days in hospital, endometritis, or change in hemoglobin. Also, there were no bladder injuries in either group.

It is clear that some studies support omission of the bladder flap during cesarean delivery, but the fact is that most obstetricians prefer to create bladder flaps during a cesarean delivery. Whether this is a product of obstetricians' early training or simple preference, bladder flap dissection remains a common step during routine cesarean delivery. Creation of a bladder flap

typically involves exchange, application, and repositioning (ie, handing off the scalpel in exchange for a blunt-tipped pickup and scissors, thereafter followed by reverse exchange of instruments) of one's surgical instruments before this step is completed. While not cumbersome, it does require more time than the procedure we have described. Our technique is rapid, generally accomplished in 3 seconds or less, and efficient. It may be performed easily with a single operator, thereby lending itself to those situations where rapid surgical delivery of the fetus is necessary. In addition to its simplicity, our technique is easy to learn and to teach. The second author has used the technique intermittently for the last 23 years and exclusively on all primary cesarean deliveries over the past 5 years, without a single incident of bladder injury. Given that bladder injury is one of the main concerns with bladder dissection, this method would be advantageous for the obstetrician to have in his or her surgical repertoire. Not only has this method proven to be safe, it allows for less awkward dissection. Although this technique is less helpful when the bladder is scarred to the anterior wall of the uterus, as frequently happens in women with prior cesareans or other abdominal surgeries, we have successfully used our bladder flap technique in roughly a third of our repeat cesarean deliveries. No long-term studies have been conducted regarding omission of bladder dissection.

## Conclusion

Although there are studies that note advantages to omission of bladder flap creation, a recent randomized controlled trial evaluating cesarean deliveries with or without creation of a bladder flap has not shown definitive support for the omission of a bladder flap.<sup>5</sup> The Pelosi-Ortega method appears to decrease operative time by omitting specific steps during cesarean delivery, but nevertheless formation of a bladder flap remains a common step during cesarean delivery. A recent overview of all data regarding omission of the bladder flap was performed, concluding that long-term data in support of bladder flap omission are still needed.<sup>6</sup> Meanwhile, our technique is easy to perform, can eliminate the exchange and repositioning of surgical instruments, and will likely decrease operative time for those surgeons who wish to create a bladder flap during cesarean delivery.





## Author Contributions

Conceived and designed the experiments: THS. Wrote the first draft of the manuscript: AJH. Contributed to the writing of the manuscript: THS, AJH. Agree with manuscript results and conclusions: THS, AJH. Jointly developed the structure and arguments for the paper: THS, AJH. Made critical revisions and approved final version: AJH. All authors reviewed and approved of the final manuscript.

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## Competing Interests

Author(s) disclose no potential conflicts of interest.

## Disclosures and Ethics

As a requirement of publication the authors have provided signed confirmation of their compliance with ethical and legal obligations including but not limited to compliance with ICMJE authorship and competing

interests guidelines, that the article is neither under consideration for publication nor published elsewhere, of their compliance with legal and ethical guidelines concerning human and animal research participants (if applicable), and that permission has been obtained for reproduction of any copyrighted material. This article was subject to blind, independent, expert peer review. The reviewers reported no competing interests.

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