

Hysterotomy incision and repair: Many options, many personal preferences

👉 Is there evidence of a best approach to managing the hysterotomy incision?



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CASE Your colleague's hysterotomy practices vary from yours

You are in the hospital on a weekend inducing labor in your patient with hypertension. A colleague asks you to assist at a primary cesarean delivery for failure to progress in the second stage. You are glad to help. During the cesarean delivery, your colleague does not create a bladder flap, makes a superficial incision in the uterus and enters the uterine cavity bluntly with her index finger, uses blunt cephalad-caudad expansion of the uterine incision, and closes the uterine incision in a single-layer of continuous suture.

In your practice your general preference is to routinely dissect a bladder flap, enter the uterus using Allis clamps and sharp dissection; use blunt transverse expansion of the uterine incision; and close the uterine incision in two layers, locking the first layer. You wonder, is there any evidence that there is one best approach to managing the hysterotomy incision?

For many obstetrician-gynecologists, cesarean delivery is the major operation we perform most frequently. In planning and performing a cesarean delivery there are many technical surgical decision points, each with many

options. A recent Cochrane review concluded that for most surgical options for uterine incision and closure, short-term maternal outcomes were similar among the options and that surgeons should use the techniques that they prefer and are comfortable performing.¹ However, other authorities believe that the available evidence indicates that certain surgical techniques are associated with better maternal outcomes.^{2,3}

In this editorial I focus on the varying surgical options available when performing a low transverse hysterotomy during cesarean delivery and the impact of these choices on maternal outcomes.

The bladder flap—surgeon's choice

Theoretically, dissecting a bladder flap moves the dome of the bladder away from the anterior surface of the lower uterine segment, thereby protecting it from injury during the hysterotomy incision and repair. Three randomized trials have evaluated maternal outcomes following a hysterotomy with or without a bladder flap. All three trials reported that maternal outcomes were similar whether or not a bladder flap was created.⁴⁻⁶

In one trial, the creation of a bladder flap during a primary cesarean delivery was associated with increased adhesions between the parietal and visceral peritoneum and between the bladder and uterus at a repeat cesarean delivery.⁵

Some authorities have concluded that **in most cesarean deliveries it is not necessary to create a bladder flap** because the evidence does not indicate that it improves surgical outcomes.³ However, there may be clinical situations where a bladder flap is warranted. For example, during a repeat cesarean delivery, if the bladder is observed to be advanced high on the anterior uterine wall because of previous uterine surgery, a bladder flap may be helpful to ensure that the hysterotomy incision is performed in the lower uterine segment and not in the thickest, most muscular part of the uterine wall.

A second example is a case of arrested labor in the second stage with a deep transverse arrest of a macrosomic fetus. Lower segment lacerations may occur in this scenario, and some clinicians elect to dissect a bladder flap in anticipation of the risk of multiple extensions and a difficult hysterotomy repair. Since bladder injury occurs in less than 1% of cesarean

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Instant Poll



In my cesarean delivery surgery, I typically:

Dissect a bladder flap:

- Yes
- No

Enter the uterus:

- Bluntly after superficial sharp incision
- With sharp incision using a scalpel

Extend the uterine incision:

- With scissors
- Bluntly—cephalad-caudad
- Bluntly—transverse

Close the uterus in:

- One continuous layer
- Two layers, continuous suture, with one or two locking layer(s)
- Two layers, continuous suture, with no locking layer

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Then watch for the results of how your colleagues typically approach surgery for cesarean delivery in an upcoming issue.



deliveries, it would be difficult to perform a study with sufficient statistical power to determine whether creating a bladder flap influences the rate of bladder injury.⁷

Entering the uterine cavity—Try blunt entry

There are few clinical trial data to guide the technique for entering the uterine cavity. A major goal is to minimize the risk of a fetal laceration. One technique to reduce this risk is to superficially incise the uterus with a scalpel and then enter the uterus bluntly with a finger. Both the Misgav Ladach and modified Joel-Cohen techniques for cesarean delivery advocate the use of a superficial incision of the lower uterine segment with blunt entry into the uterine cavity.^{8,9} Other surgical options for entering the uterine cavity with minimal risk to the fetus include:

- Superficially incise the uterus with a scalpel and then apply Allis clamps to the upper and lower incision. Pull the tissue away from the underlying fetus before incising the final layer of uterine tissue and entering the cavity.¹⁰
- Apply the tip of the suction tubing with suction on and gently elevate the tissue trapped in the suction tip, incising the tissue to enter the uterus.
- Use a surgical device designed to reduce fetal lacerations (such as C-SAFE, CooperSurgical) to enter the uterus and extend the hysterotomy incision.¹¹

Expanding the uterine incision—Use blunt expansion

Authors of a recent Cochrane meta-analysis analyzed five randomized controlled trials, involving 2,141 women, that evaluated blunt

versus sharp expansion of a low transverse uterine incision.¹ There was no difference in maternal febrile morbidity or major morbidity between the two techniques. However, blunt expansion of the uterine incision was associated with slightly less maternal blood loss and a lower risk of maternal blood transfusion than sharp incision (0.7% vs 3.1%).¹ In another meta-analysis blunt expansion of the uterine incision with the surgeon's fingers resulted in a smaller decrease in hematocrit and hemoglobin levels and fewer unintended extensions, but no difference in the rate of blood transfusion.¹² Based on these findings some authorities recommend using blunt expansion of the uterine incision when a lower uterine segment incision is performed.³

One study, involving 811 women, compared cephalad-caudad blunt expansion versus transverse blunt expansion of the uterine incision.¹³ Cephalad-caudad blunt expansion compared with transverse blunt expansion resulted in a trend to less blood loss (398 mL versus 440 mL; $P = .09$), a significantly lower rate of unintended extension of the uterine incision (3.7% vs 7.4%, $P = .03$) and fewer cases with blood loss greater than 1,500 mL (0.2% vs 2.0%, $P = .04$). However, there was no difference in the rate of transfusion (0.7% vs 0.7%, $P = 1.0$) between cephalad-caudad versus transverse blunt expansion. Based on the results from this one trial, some authorities recommend that cephalad-caudad blunt extension be utilized rather than transverse blunt extension.³

Closing the uterine incision—One or two layers?

In the recent Cochrane meta-analysis, researchers compared outcomes of single-layer and two-layer

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closure of the uterine incision in 14 studies involving 13,890 women.¹ There was no difference in rates of febrile morbidity (5.0% vs 5.1%), wound infection (9.4% vs 9.5%), or blood transfusion (2.1% vs 2.4%) between the two techniques. Authors of another systematic review of 20 trials of single- versus double-layer closure of the uterine incision concluded that, based on the available evidence from randomized trials, single- and double-layer closure appeared to produce similar outcomes.¹⁴ These authors cautioned, however, that based on nonrandomized studies, single layer closure might be associated with an increased risk of uterine rupture in a subsequent pregnancy.^{15,16}

A uterine incision that was closed with a locked single-layer closure may be at an especially high risk of rupture during a subsequent trial of labor. In one analysis of relevant reports with heterogeneous study designs, the risk of uterine rupture during a trial of labor after a prior cesarean was 1.8% with a double-layer closure, 3.5% with an unlocked single-layer closure, and 6.2% with a locked single-layer closure.¹⁷ My perspective is that a double-layer closure generally is preferred because in a future pregnancy with a planned vaginal delivery, the double-layer

closure may be associated with a lower rate of uterine rupture.

Some authorities recommend single-layer uterine closure if the patient is sure that she has no future plans to conceive. For example, a woman who is undergoing a tubal ligation at the time of cesarean delivery may be an optimal candidate for single-layer closure.³

Individualization and innovation in surgical care

Surgeons advance their skills by continually using the best evidence and advice from colleagues to guide changes in their practice. Many clinical situations present unique combinations of medical and anatomic problems, and surgeons need to use both creativity and expert judgment to solve these unique problems. Surgical choices that are guided by both the best evidence and hard-won clinical experience will result in optimal patient outcomes. 



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