

# Cesarean Hysterectomy for Family Medicine Physicians Practicing Obstetrics

Daniel M. Avery, MD

Dwight E. Hooper, MD, MBA

John B. Waits, MD

## Abstract

Cesarean hysterectomy is an uncommonly performed, but life-saving operation, usually for massive hemorrhage. One of the criticisms of family medicine physicians practicing obstetrics is that they are not trained in cesarean hysterectomy should the occasion arise. Unfortunately, newly graduated OB/GYN physicians, likely, have rarely performed a cesarean hysterectomy either. Even seasoned OB/GYNs may not have performed the procedure for quite some time. This paper describes a straightforward approach to cesarean hysterectomy that family medicine physicians practicing obstetrics or newly graduated OB/GYN physicians can perform. Following this description is a case report of a cesarean section hysterectomy performed by an obstetrics fellowship trained family medicine physician with a general surgeon for a ruptured uterus in a rural hospital without a labor and delivery unit or nursery. Both mother and baby survived.

## Introduction

Cesarean hysterectomy is a life-saving skill rarely required of those who practice obstetrics. One criticism, perhaps unfair, of family medicine physicians practicing obstetrics today is that they have not been trained in cesarean hysterectomy since the need could possibly arise for uncontrollable hemorrhage. Few graduates of OB/GYN residencies performed a cesarean hysterectomy during training either. Only those who have practiced obstetrics for years have had the occasion to perform a significant number of cesarean hysterectomies.

Minilaparotomies for the management of ectopic pregnancies and laparotomies for postoperative hemorrhage after cesarean section have been taught by our fellowship for the last several years. The techniques have been described elsewhere by two of the authors. We postulate that family medicine physicians can also perform cesarean hysterectomies when needed. This paper describes a straightforward technique that a family medicine physician practicing obstetrics or even a newly graduated obste-

trician/gynecologist can use. Use of this procedure can be life-saving to control massive hemorrhage after a cesarean section or even after a vaginal delivery when there is no other alternative.

## History of Cesarean Hysterectomy

The first cesarean hysterectomy performed in the United States was by H.R. Storer in Boston; unfortunately, it was unsuccessful, and the patient expired on postpartum day three.<sup>1</sup> Edward Porro is credited with the first successful cesarean hysterectomy in this country in 1876.<sup>1</sup> For years the procedure had Dr. Porro's name attached to it, being referred to the Porro Hysterectomy.<sup>1</sup> "Cesarean hysterectomy is by definition a life-saving procedure performed to control hemorrhage," according to Nichols.<sup>2</sup> During the training of one of the authors in the late 1970s and early 1980s, cesarean hysterectomy was performed for sterilization, but is now done for this indication. Over time, more techniques to control bleeding and conserve the uterus have been developed. Considerably fewer cesarean hysterectomies are performed today.

## The Operation Itself

A cesarean hysterectomy is very different from a non-pregnant hysterectomy. It is uncommonly performed, and when it is, it is under emergency, life-threatening conditions that are stressful to everyone involved. The uterus is very enlarged, the tissues are very friable, uterine vessels are very enlarged, and there is no vaginal prep.<sup>2</sup> Because of the vessel size, most pedicles must be double-tied.<sup>3</sup> It is a last resort and infrequent procedure.<sup>2</sup> The procedure uses the same principles as an abdominal hysterectomy in the non-pregnant state.<sup>1</sup> Most of the morbidity is related to the reason the procedure is usually done – hemorrhage.<sup>3</sup> The incidence of the procedure is 1 in 950 to 1 in 1850 deliveries.<sup>4</sup> Approximately 90% of women undergoing a cesarean hysterectomy will need a transfusion.<sup>4</sup> In inexperienced hands subtotal hysterectomy (supracervical) is prefer-

able if it controls bleeding, because intraoperative bleeding and urologic injuries are less.<sup>2,3</sup> With the increase in the number of women who have had a cesarean section, there is a concomitant increase in the number of cesarean sections that are technically difficult, those with a plentiful scar tissue, previas, accretae, ruptured uteruses, and hemorrhage requiring a cesarean hysterectomy.<sup>1</sup> Most cesarean hysterectomies are unplanned today after more conservative measures have failed.<sup>1</sup>

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## Preparation for the Procedure

Usually when the decision is made to perform a cesarean hysterectomy, all conservative efforts have been employed to control massive hemorrhage. If logistically feasible and it does not detract from clinical management during this emergent circumstance, informed consent from the patient, if not under general anesthesia, or the patient's family should be obtained. The anesthesia personnel and entire operative team should be made aware that a life-threatening emergency now exists requiring an emergency hysterectomy. Anesthesia personnel will determine the need for additional anesthesia, availability of blood and blood products, whether blood has already been given or not. Additional large bore intravenous lines, arterial or central lines may be needed. The blood bank needs to know that more blood may be needed. Usually for a cesarean hysterectomy, it is prudent to have four units of packed red cells ready and an order to "stay ahead two units." Fresh frozen plasma is usually needed for every two or three units of packed cells. All efforts to stabilize the patient before beginning the hysterectomy should be made: note that this will usually cause more blood loss. All clinicians must remain aware of current blood loss and urine output. A broad-spectrum second generation cephalosporin should be given for prophylaxis.<sup>5</sup> Our institution follows the recommendations of Dr. William Andrews at the University of Alabama in Birmingham Medical Center and adds 500 milligrams of azithromycin to cover facultative organisms.<sup>6</sup> If the cesarean section incision is insufficient, it should be extended laterally if Pfannenstiel or superiorly if vertical. A Pfannenstiel incision may be converted to a Maylard incision in which the rectus muscles are divided, taking care to ligate the inferior epigastric arteries immediately beneath the rectus sheath. While cosmesis is diminished, adding a median vertical incision to the pre-existing transverse incision (creating an anchor-like incision) should not be delayed if operative exposure is not optimal to control bleeding.

It is crucial to accept that this unexpected change in plans requires seeking and accepting whatever help is in the patient's best interest. Even the assistance of a colleague with no more experience than oneself is invaluable. An OB/GYN who has done many cesarean sections is the best help available, and it may be prudent to let him be the surgeon and you the assistant. Accept that at this juncture, you are physically and emotionally exhausted. An OB/GYN, family medicine obstetrician who does cesarean sections, general or vascular surgeon, urologist, GYN oncologist, anesthesiologist, surgeon's assistant, experienced nurse, surgical assistant or physician who is willing to help are welcomed. I

have had the help of an emergency medical technician in a rural hospital when there was no one else to assist.

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## Instruments

Most operating suites that perform cesarean sections have available a hysterectomy tray. If not, at least four Heaney, Heaney-Ballentine or Zeppelin Hysterectomy clamps, multiple Kelley clamps, two Oschner clamps, many 0 or 1 Vicryl or chromic sutures, a self-retaining retractor such as an O'Connor-O'Sullivan or Balfour Retractor and many lap packs will be necessary. Adequate suction and Bovie electrocautery are also needed, if not already on the operative field. If not already done for this case, consideration should be given to making such a pack immediately available later.

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## Overall Vision of the Operation

Elevate the uterus from the abdomen and hold it with a moist lap pack with one hand. It is usually about one-third the size it was before delivering the baby. Usually a bladder flap has been made and a low transverse incision has been made in the lower uterine segment. The sides of the uterus containing the broad ligament need to be clamped and cut away from the uterus to free it. At the bottom of the uterus, the uterine vessels need to be clamped and cut, and the uterus needs to be amputated from the cervix. If visualization of the uterus is impossible due to massive bleeding, the aorta may be compressed by placing a moist lap just above the bifurcation and pressing posteriorly against the vertebral column. The anesthesiologist should be informed of compression of the aorta to manage the change in blood pressures. Keep in mind that the objective is hemostasis, not treatment, of cervical pathology as is sometimes the indication for non-obstetrical hysterectomy. As such, once hemostasis has been achieved, leaving the cervix intact will shorten operating time and likely reduce blood loss and risk of complications.

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## Procedure

Start by placing two clamps side by side on either side of the uterus at the top of the broad ligament, called the utero-ovarian ligament. This is something to hold to and support the uterus, and it greatly decreases the blood flow to the uterus from the ovarian arteries. Medial should be a Kelley and lateral a Heaney, Heaney-Ballentine, or Zeppelin clamp. The round ligaments should be clamped with an Oschner or hysterectomy clamp, divided, suture-ligated with 0 or 1 Vicryl or 0 or 1 chromic sutures, left long and clamped with a Kelley clamp. The anterior leaf of the broad ligament should be extended downward and join the bladder flap peritoneum. To decrease blood flow from the uterine arteries, perform O'Leary-O'Leary ligations bilaterally of the uterine arteries as far down on the uterus as possible. This is done by placing the suture through the broad ligament lateral to the uterine vessels, into the myometrium posteriorly, then coming out of the myometrium anteriorly medial to the vessels. Tie them down to ligate the vessels, or clamp the vessels at the uterine incision.

The idea is to double clamp every time on the broad ligament, cutting between the clamps. The medial Kelley prevents back-flow bleeding from the uterus, and these are left on until the uterus is removed. The lateral hysterectomy clamps hold tissue that is Heaney stitched with Vicryl or chromic suture. Divide the tissue between the clamps with scissors or a knife then suture-ligate the tissue by placing the needle of the suture through the end of the incision and wrap in around the clamp and again place the needle through the middle of the tissue and tie it down while the assistant gently releases the clamp. Most authorities recommend double-tying pedicles.<sup>2</sup> Repeat this procedure contralaterally, alternating this process down to the lower uterine segment. Cross clamp the uterine vessels at a 90 degree angle, suture-ligate and double tie. Using a hysterectomy clamp, clamp successively across the uterus from each side. Clamp, cut, stitch, and tie. Amputate the uterus and place a moist lap over the cervical stump for the assistant to hold pressure. Back up, sit down, and take a breath. Let the assistant hold pressure for five minutes. Insert a self-retaining retractor, if not already done, and pack the bowel out of the operative field to observe for bleeding.

Slowly remove the pack and observe for any bleeding. Significant bleeding from the lower uterine segment will require either oversewing or removal of more tissue if there are tears or remaining placenta. The pelvis is inspected and irrigated. The lower segment can be closed with running or interrupted Vicryl or chromic suture. Typical sites of bleeding include the cervical stump, the broad ligament, the utero-ovarian ligament, and the ligation of the uterine vessels. Identification of the ureters is important, if they can be located. They are very close to the cervix.

**Table 1:** Percentage of family physicians with cesarean privileges by census division

Census Division	States	% of FPs with cesarean privileges
New England	CT, ME, MA, NH, RI, VT	2.4
Mid Atlantic	NJ, NY, PA	0.0
East North Central	IL, IN, MI, OH, WI	8.0
West North Central	IA, KS, MN, MO, NE, ND, SD	13.1
South Atlantic	DE, DC, FL, GA, MD, NC, SC, VA, WV	2.3
East South Central	AL, KY, MS, TN	18.5
West South Central	AR, LA, OK, TX	12.2
Mountain	AZ, CO, ID, MT, NV, NM, UT, WY	4.0
Pacific	AK, CA, HI, OR, WA	6.2
<b>Total</b>		<b>7.3</b>

## Closing the Abdomen

If no significant bleeding is apparent, begin closing the abdominal incision and skin. Inform the patient, if she is awake, and the family. Remove instruments, packs, and retractors. A nasogastric tube may be necessary. If oozing is apparent, drains may be appropriate. Check the status of the patient, stability of the vital signs and urine output, and clarity (lack of which may suggest a ureteral injury). The fascia may be closed with running Vicryl or PDS suture. The skin can be closed with skin staples. Affirm closing instrument and pack counts. Select appropriate laboratory studies for the Post Anesthetic Care Unit, including hematocrit, coagulation studies, and electrolytes. Beware that the blood loss and replacement may result in disseminated intravascular coagulation and its complications or hemostasis that may be incomplete and postoperative bleeding may become brisk.

## Case Report

A 30-year old female at an estimated 36 weeks gestational age who had previously delivered by classical cesarean section presented by ambulance to a rural 20-bed hospital with an acute abdomen, decreased level of consciousness, hemorrhagic shock, and non-reassuring fetal heart tones. No functioning labor and delivery unit was present. The patient was seen by a family medicine obstetrician with the working diagnosis of a ruptured uterus and hemorrhagic shock. Informed consent was obtained from the husband for an emergency cesarean section by the family medicine obstetrician and a general surgeon and whatever procedures were necessary to save the mother and baby's life.

On arrival in the operating room, the patient became unresponsive and fetal heart tones were lost. The nurse anesthetist had not arrived yet, so the procedure was begun with local anesthesia. Lidocaine was used to inject the previous abdominal scar and then the fascia which were incised. The nurse anesthetist arrived and quickly instituted general anesthesia. Upon opening the fascia and peritoneum, the baby was freely floating in the abdominal cavity, which was full of blood. The baby was delivered, suctioned, cord clamped, and passed to the nursery personnel for resuscitation. The APGARs were 2 and 4. The baby weighed 2637 grams. The placenta was delivered.

The uterus was ruptured from the top of the fundus down to the lower uterine segment. An Oschner Clamp was placed across the round and broad ligaments on either side of the uterus. Each bite was clamped, cut, and tied with #1 Vicryl suture. This was repeated down to the lower uterine segment. Hemostasis was achieved. Oschner Clamps were placed across the lower uterine segment and the uterus amputated. The lower uterine segment was closed with #1 Vicryl suture. Hemostasis was good. The family medicine obstetrician joined the nursery staff to help stabilize the baby, while the general surgeon closed the abdomen. The fascia was closed with #1 Vicryl and skin closed with skin staples. The patient tolerated the procedure well. The estimated blood loss was 1800 cc. The only six units of incompatible blood from the blood bank were transfused during

the procedure. Sponge and needle counts were correct. Urine output was good. After the patient was recovered, she and the baby were transported to a tertiary care center by helicopter. The mother and baby both did well.

## Discussion

Cesarean hysterectomy is an uncommon but, when needed, life-saving obstetrics operation that any experienced family medicine obstetrician can perform. Graduating OB/GYN Residents like Family Medicine Obstetrics Fellows get minimal, if any, experience in learning this procedure during training. However, with experience operating on the uterus and managing bleeding, Family Medicine Obstetricians can perform this procedure in a life-threatening emergency. Exposure to operative techniques and instruments for non-pregnant hysterectomies during postgraduate training can be helpful.

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*Daniel M. Avery, MD, is Associate Professor and Chair, Department of Obstetrics & Gynecology at the University of Alabama School of Medicine.*

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*Dwight E. Hooper, MD, MBA, is Associate Professor and Associate Chair, Director of Postgraduate Education, Department of Obstetrics and Gynecology at the University of Alabama School of Medicine.*

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*John B. Waits, MD, is Assistant Professor of Family Medicine, Assistant Professor of Obstetrics and Gynecology, Family Medicine Residency Program Director, Department of Family Medicine, at the University of Alabama School of Medicine.*

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## References

1. Gabbe SG, Niebel JR, Simpson JL, Eds: *Obstetrics Normal and Problem Pregnancies*. 4<sup>th</sup> Edition. Philadelphia, PA: Churchill Livingstone; 2002, Chap 18: Cesarean Delivery; 587-600.
2. Nichols DH, Ed: *Gynecologic and Obstetric Surgery*. St. Louis, MO: Mosby. 1993. Chap. 68: Obstetric Operations, 1126-1133.
3. Rock JA, Jones HW, III: *TeLindes's Operative Gynecology* 9<sup>th</sup> Edition. Philadelphia, PA: Lippincott, Williams and Wilkins. 2003. Chap 32: Gynecologic Surgery for Obstetric Patients. 829-34.
4. Cunningham FG, Leveno KJ, Bloom SL, Hauth JC, Wenstrom KD: *Williams Obstetrics* 22 Edition. New York, NY: McGraw-Hill 2005. Chapter 25: Cesarean Section and Peripartum Hysterectomy, 598-603.
5. American College of Obstetricians and Gynecologists: 2003 Compendium of Selected Publications. Number 23, Jan, 2001.
6. Unpublished. Andrews WA: Prevention of Post Cesarean Endometritis. Grand Rounds
7. Presentation at the University of Alabama School of Medicine, 12/17/03. Tuscaloosa, AL.