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A VBAC Primer: Technical Issues for Midwives

by Heidi Rinehart, MD

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Midwives around the United States are continuing to define the "midwifery model of care." A clear and comprehensive definition will empower midwives to create a unified midwifery profession, to outline their scopes of practice and to create standards for practice. A consensus about the knowledge and skills of a newly trained midwife seems to be slowly evolving. What remains a controversy is this: just what clinical circumstances with increased risks for mothers and babies require special knowledge and resources for consistently good outcomes? Vaginal births after a previous cesarean section (VBACs) are one such circumstance.

Women pregnant after a previous cesarean section have special needs and concerns. There are many excellent books and articles focusing on the powerful experience of VBAC—the courage, faith, joy, and triumph of a vaginal birth after a previous disillusioning cesarean. The technical information about cesarean sections and VBACs in this article is designed to assist the midwife in analyzing her knowledge, training and emergency resources to attend VBACs, regardless of setting. My hope is that a midwife reading this will write (or re-evaluate) her practice protocols for pregnancies following a cesarean section. The vibrant future of midwifery in the United States and around the world lies in midwives being accountable for superior outcomes for mothers and babies, while promoting the gentlest birth possible for any clinical situation.

The History of Vaginal Birth after Cesarean

The first woman in recorded history to survive a cesarean section, performed by her farmer husband in 1500, went on to have several more vaginal births. Even in the early 1900s a cesarean section was a radical surgery reserved for extreme obstetrical circumstances. The risks for women in terms of morbidity and mortality were substantial in that era. Though Dr. Cragin attended VBACs himself, he coined the famous saying, "once a cesarean, always a cesarean," to emphasize that the first operation often led to subsequent dangerous surgeries. In Europe VBAC was the norm throughout the last century, while in the United States VBAC was almost unheard of until the 1950s. The trickle of VBACs increased until the early 1980s







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when several large studies confirmed the relative safety of VBAC. About the same time, Nancy Wainer Cohen and Lynn Baptisti Richards published their influential books (see references at the end of this article) about the ill effects that cesareans can have on women's psyches and the joyful triumph that accompanies VBACs. The trickle of VBACs became a steady stream, to the point that obstetricians began attending meaningful numbers of VBACs in the late 1980s and 1990s.

The early 1990s saw VBACs being recommended to more and more women, managed care organizations encouraging doctors to do VBACs, the contraindications for VBAC shrinking, the uterine closure technique changing from a double-layer to a single-layer closure, and obstetricians managing VBACs like any other birth (induction, aggressive use of Pitocin, epidurals, etc.). Meanwhile, doctors and hospitals began seeing some catastrophic complications of previous cesareans, the most frequent being uterine rupture in labor and the most dramatic being placenta percreta. As a result, obstetricians lost some of their enthusiasm for VBACs when serious complications left vivid and terrifying memories. The American College of Obstetricians and Gynecologists (ACOG) retreated on some of its earlier endorsement of VBACs by changing the Clinical Management Guidelines for Obstetrician-Gynecologists in July 1999. These guidelines reflect a more cautious approach to VBAC and a less enthusiastic endorsement than previously. Some midwives have been attending VBACs for years, many with excellent outcomes. But there have been a few tragedies in the homebirth community that, together with the changing mood among obstetricians, have many midwives taking a second look at VBAC.

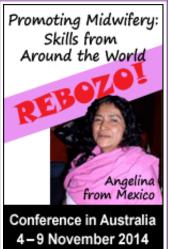
The likelihood that a woman will have a successful VBAC depends to some extent on her obstetrical history and the reason for her previous c-section. The published success rates for hospital VBACs generally range from 60-80 percent. A woman who had a vaginal birth followed by a c-section is much more likely to have a VBAC than a woman who has never had a vaginal birth. Women having a VBAV (a non-standard term that we use in our practice for a woman having a "vaginal birth after a VBAC") are also very likely, but not guaranteed, to have another successful VBAC. Women with non-recurring reasons for the first c-section, such as fetal distress or breech, have higher VBAC success rates than women given a diagnosis of cephalopelvic disproportion (CPD) or failure to progress (FTP). The initial CPD diagnosis is fraught with difficulty, since successful VBAC babies are sometimes 1 to 1.5 pounds bigger than the "CPD" older sibling.

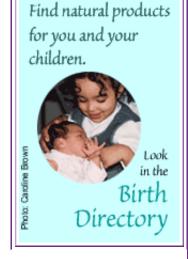
Contraindications to VBAC

There are a number of contraindications to VBACs that the vast majority of obstetricians and most midwives agree on. Most of these involve significantly higher risks to mother and baby due to increased rates of uterine rupture. There are, of course, anecdotes of successful VBACs in these situations, but the statistics reveal accelerated risks.

These situations include: classical (vertical) scar on the uterus, T- or J-incision on the uterus, previous surgery through the full thickness of the uterine muscle (example, myomectomy), truly









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contracted or deformed pelvis, inability to perform an emergency cesarean delivery if needed, obstetrical complications that preclude vaginal delivery (example, placenta previa), and a woman's refusal to have a Trial of Labor/VBAC.

Types of Uterine Incisions

The type of uterine incision made at the previous cesarean section is important in evaluating suitability for a VBAC. The scar visible on the skin does not necessarily predict what type of uterine incision might be found underneath. Where in the uterus the incision was made affects its strength and integrity after healing. The upper part of the uterus is composed of a different type of tissue than the lower uterine segment and cervix. The fundus, together with the upper three-quarters of the uterus, is composed of a thick, muscular tissue that does not heal with a very durable scar, while the lower uterine segment is composed of a fibroelastic tissue that heals guite well and is more flexible and elastic when stretched after healing. Virtually any scar is weaker than the surrounding native tissue (like the old episiotomy scar that springs open during the most gentle birth). Usually the forces of labor will dilate a ripe cervix but labor will open the path of least resistance, which in a few cases will be the previous uterine incision. In addition, any incision that extends into the muscular portion of the uterus is much more vulnerable to disruption in a subsequent pregnancy and labor because of the poorer integrity of scars in the muscle. A low transverse, or low cervical, incision is the preferred uterine incision in any VBAC. Below are the types of uterine incisions and their published rates of uterine rupture.

Single- vs. Double-Layer Uterine Closure

In the early 1990s the double-layer uterine closure technique gave way to the single-layer closure technique. The single-layer technique was adopted because it shortened operative time and the very limited data on a few hundred women suggested that uterine rupture was no more common than with the double-layer technique. There is not enough data comparing these two techniques to know if one is superior in terms of uterine rupture, placenta previa or abnormal placentas (accreta and percreta) in subsequent pregnancies.

"Imbrication" is the word frequently used to describe the second layer of the uterine closure. The operative note of a double-layer closure might read something like this.

The uterine incision was closed with a locking suture of #1 Chromic. It was subsequently imbricated with a running suture of #1 Chromic.

In our practice we have resumed a double-layer closure for cesareans, because we think that a thicker uterine scar makes it less vulnerable to placenta percreta and uterine rupture, but we have no data on which to base that decision. We continue to offer VBACs to women who had a single-layer closure.

Most VBAC practitioners have their clients fill out a release of information form, requesting the operative note and the discharge summary from the hospital where the cesarean was performed. Hospitals generally keep obstetrical records longer

than others, but they can be hard to locate in long-term storage. Medical records departments are not known for their prompt response, so it is prudent to seek these records early and persistently. The operative note, detailing the incision and its closure, together with the hospital discharge summary usually provide the level of detail needed to evaluate a VBAC candidate. In the event that the operative note cannot be located, it is a judgment call whether to proceed with a VBAC. The vast majority of uterine incisions in the United States are low transverse, except when the c-section is performed for a transverse lie or a premature breech. The University of Southern California, which cares for many undocumented immigrants, has permitted VBACs with an unknown scar, but they have 24-hour obstetrician and anesthesia coverage on Labor and Delivery to perform surgery within minutes.

Risks of Pregnancy after a Previous Cesarean Section

A common misconception is that a healthy, well-nourished woman with a previous cesarean section is at no increased risk in her subsequent pregnancy and delivery. This attitude has been fostered by the incredibly inspiring stories in *Very Beautiful and Courageous*, the book edited by Lynn Baptisti Richards. This must be tempered by the knowledge that women with previous cesareans, as a group, suffer increased complications in subsequent pregnancies regardless of mode of delivery. Complications of previous cesareans are not a reflection of the woman's state of health as the new pregnancy begins; rather, these problems are late complications of a surgery performed years before.

There are three main obstetrical problems that occur more commonly in scarred uteruses. The first is placenta previa, occurring in approximately 1 percent, which is twice as common as in the unscarred uterus. Repeat cesarean section minimizes mortality for mother and babe, but mother still faces significant higher risks of hemorrhage, transfusion, hysterectomy and death.

The second obstetric pathology is placenta accreta and placenta percreta. These are abnormally implanted placentas, which invade the uterine wall. A placenta accreta is missing the basalis layer of the decidual lining of the uterus and is stuck to the underlying myometrium (muscle layer of the uterus). The more rare placenta percreta has imbedded so deeply into the uterus that the placenta is actually attached to an adjacent organ, usually the bladder at the site of the scar, and develops a tremendous blood supply to feed the placenta. Some placenta percretas are not diagnosed until after a vaginal delivery. Of the three maternal deaths related to cesarean sections that I have seen in my career, two of them were from percretas (the other was due to a surgical error that led to disseminated intravascular coagulation, or DIC). Neonates frequently have a good outcome in these cases, but maternal mortality is 7 percent with placenta percreta even when it is diagnosed prior to the delivery. A placenta percreta is a much greater threat to a woman's life than a uterine rupture. The women who have been spared often received maximal transfusion therapy and aggressive surgical care in major medical centers. Targeted

ultrasounds specifically looking for accreta/percreta in the lower uterine segment are sometimes alerting obstetricians to this condition in advance of delivery, so that preparations can be made.

The third antepartum complication is uterine rupture before the onset of labor, occurring in 0.2 percent of previous-cesarean women. Because uterine rupture does occur before labor in some women with a scarred uterus, signs and symptoms of uterine rupture before labor deserve evaluation. A few studies suggest that, in women with previous cesarean section, the uterine rupture rate before the onset of labor is just about one-half that of the uterine rupture rate seen with a trial of labor.

Risks of VBAC

Most practitioners are aware that uterine rupture can occur in labor, but it occasionally becomes evident immediately postpartum. The risk of uterine rupture after one previous cesarean section varies in different studies from 0.2 percent to as high as 1.5 percent. Several of the studies show a clustering around 0.4-0.8 percent. (This risk is comparable to the risk of serious abruption, damaging fetal distress, and cord prolapse.) Uterine rupture has been observed to be 40-50 times more likely in women with a scarred uterus than an unscarred uterus. A separation of the uterine scar can result in death or neurologic injury for the baby (estimated at 30 percent), hysterectomy, blood transfusion, injury to other organs such as the bladder, or death for the mother (estimated at 1-2 percent). Significant neonatal morbidity and mortality often occurs when the time between an abnormal fetal heart rate pattern (signaling rupture) and delivery is more than 18 minutes, according to one large study.

Recent studies suggest that women with two previous cesareans have a three- to five-fold greater risk (between 1.7 and 3.7 percent of all labors) of uterine rupture than women with one previous cesarean. The recommendation of the authors of these studies was that women who are attempting a VBAC after two previous cesareans should labor in a hospital with immediate c-section and hysterectomy capabilities. In our own practice we no longer offer VBAC to women with two previous cesarean sections, neither in our freestanding birth center nor in our rural hospital, due to this significantly greater risk. We will refer women desiring VBAC after two cesareans to medical centers that have the resources to respond to uterine rupture within minutes.

When a trial of labor is unsuccessful, the subsequent c-sections have higher morbidity and mortality for the women and their babies than do scheduled, no-labor, repeat c-sections. These complications include chorioamnionitis, transfusion, bladder injuries and hysterectomy, among others. To put it bluntly, women with successful VBACs have the lowest morbidity, scheduled repeat c-sections have the next lowest, while unsuccessful VBACs have the highest morbidity.

Factors that Increase the Risk of Uterine Rupture

seen more frequently with uterine rupture: prostaglandin cervical ripening, Cytotec/misoprostol ripening, induction of labor, use of Pitocin, failure to progress, forceps/vacuum, and epidurals. While home VBAC does create time and distance barriers to responding to a crisis, home VBAC does not introduce iatrogenic risk. Home VBAC with rapid access to surgical intervention may be safer than interventionist hospital obstetrics with VBAC, but there are no data that midwives may cite to support that assertion. The ACOG Clinical Management Guidelines and most obstetricians do not acknowledge most of the iatrogenic risks listed above, even though several retrospective studies have shown statistical significance. A recently published study actually looked at rupture rates in VBACs after one previous c-section. They found that the rupture rate was 0.4 percent in spontaneously laboring women, while the rate was 1.0 percent in oxytocin-augmented labors and 2.3 percent in induced labors. There is a growing body of retrospective studies that suggest that meddlesome obstetrics increases the risk for VBACs, which in turn suggests that the midwifery model of care is safer for women seeking VBAC. However, there may not be many medical professionals or public health officials who would agree that an out-of-hospital. midwife-attended VBAC could be safer than obstetricianattended hospital VBACs.

In several large studies of VBACs, the following factors were

There are other factors that may affect the rate of uterine rupture because they impair optimal healing of the uterine incision. Factors that may increase the risk of rupture, but are unproven, include: chorioamnionitis at the time of c-section, post-operative endometritis, diabetes mellitus, steroid use during the healing process, and a short interval between pregnancies that does not allow for complete healing. Reviewing the operative note and discharge summary will usually reveal these, and they can be used as minor influencing variables in assessing a VBAC candidate.

Signs and Symptoms of Uterine Rupture

For some reason many birth attendants believe, mistakenly, that a searing suprapubic pain is the most common symptom of uterine rupture in labor. Studies that examined the circumstances of uterine ruptures found that most were revealed by abnormal fetal heart rate patterns*. The earliest and most common sign of uterine rupture was abnormal fetal heart rate patterns. The most common patterns seen are isolated, prolonged decelerations or repetitive, deep variable decelerations in active labor. Fetal heart rate changes in a VBAC labor should be interpreted with more caution and result in a lower threshold to transport quickly to the hospital.

There are other signs and symptoms of uterine rupture including: Intrapartum vaginal bleeding*, postpartum hemorrhage*, changes in maternal mental status* (confusion, stupor, etc.), maternal instability in pulse and blood pressure*, maternal shock, loss of fetal station, a perception of fluid in the mother's abdomen beyond the margins of her uterus*, and, of course, an unusual pain in the region of her uterine incision*. Note: The ones marked with a star (*) are ones that I (or a colleague) have personally seen.

Recommendations to Midwives Doing Home VBACs

- 1. Learn about the physical and psychological differences in a woman with a previous cesarean.
- Define the comfort zone of the practitioner to attend VBACs.
- Develop a VBAC practice protocol that reflects the midwife's knowledge/comfort and access to emergency/surgical services in labor.
- 4. Engage in detailed informed consent with the client.
- 5. Perform an ultrasound early in the third trimester to rule out a placenta that is overlying the previous scar.
- 6. Know 1) the transport time to the nearest hospital with emergency c-section capabilities, and 2) the time for that hospital to initiate emergency surgery (range from less than 10 minutes to 60 minutes depending on the size and resources of the particular institution and its responsiveness to the midwife's call ahead). A regional trauma center often will have the most rapid response after hitting the ER door.
- Decide in advance if your VBAC protocol is negotiable or not.

Home VBAC Protocol

In talking to midwives, it is clear that VBAC protocols vary among midwives. An important factor is the responsiveness of the EMS system, as well as the responsiveness of back-up doctor and hospital to a midwife's emergency call. Some midwives have back-up who will activate resources to respond to an emergency based on the midwife's assessment alone; others will do nothing until they have made their own assessment which can mean valuable time lost in responding to a crisis. The rural midwife dealing with a small hospital may have a different protocol than an urban midwife with IV equipment who is minutes from a trauma center. A homebirth midwife's VBAC protocol might include: a third trimester ultrasound for placental location, an informed consent document for VBAC clients, distance to hospital constraints, limit on the number of previous c-sections, operative note confirmation of type of scar, a double-layer closure, a responsive back-up doctor/hospital, no stimulation of labor with herbs or other methods (especially Cytotec!!), at least two midwives at the birth, an IV or Heplock, more frequent FHT assessment, strict progress in labor guidelines, no manual extraction of adherent placenta rule, providing EMS with a map to the house, alerting the back-up doctor to an upcoming VBAC (then giving him/her the "all clear" when she is safely delivered), etc, etc.

Conclusion

Women pregnant after a previous cesarean section have special needs and concerns that are social, psychological and clinical. The skillful midwife uses all of her talents—intellect, interpersonal communication, intuition and judgment—to nurture, protect and empower the pregnant women in her care. The technical information about cesarean sections and VBACs in this article can be used as one element to educate parents, to

develop practice protocols and to heighten awareness in the practice of midwifery.

Author's Note: This article is dedicated to the dozens of women who have shared their triumphant, life-changing VBACs with me, and to the memory of Helen Giordano. May their joys, sorrows, triumphs, and tragedies continue to illuminate the wisdom of my practice.

Heidi Rinehart, MD is the mother of two children, Julianna (8) and Peter (5), both born into the hands of direct-entry midwives. She and her husband, Rudy Fedrizzi, are board certified OB/GYNs in practice with the CPMs at the Women's Health and Birth Center in Taos, New Mexico. Heidi enjoys serving on the Licensed Midwives Advisory Board for the State of New Mexico, but finds her joy in figure skating and hiking.

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A Sample Informed Consent

A woman with a previous cesarean section is in a special situation with her subsequent pregnancies. Having had an operation on your uterus to deliver a baby changes the uterus (discussed below), just as it probably changed your feelings about yourself and about childbirth. Women who have had a cesarean are often grateful for their healthy baby but disappointed or depressed at missing out on this powerful feminine experience. I encourage you to read about other women's experiences with vaginal birth after cesarean (VBAC) and will recommend several books. A VBAC can be a joyful, triumphant, gentle, family-centered, fulfilling experience that can change a woman's life.

There are some unique complications that occur more commonly after a uterine surgery such as a c-section. One is the risk of a repeat cesarean section. Another is an abnormal placental implantation or location in the uterus. Another is separation of the old uterine incision. No one can insure a healthy outcome for mother and baby, but there are some things that will lessen risks for a hospital or out-of-hospital VBAC. First, it is important that there has been only one previous c-section. Second, we will confirm that the uterine incision was low-transverse because that type of incision heals with the strongest scar. Third, we need to make sure in the third trimester that the placenta is not covering the cervix or the uterine incision.

I will provide you with as much counseling, guidance, and detailed information as you need

to enable you to make a thoughtful and informed decision about your upcoming birth. You will be asked to consider your hopes and fears and to decide whether a homebirth VBAC with a midwife is the best decision for you. Other options include a hospital birth with a doctor or nurse-midwife or a repeat cesarean section with an obstetrician.

Some of the special risks in a VBAC include: the risks of a repeat cesarean section in labor, an abnormal placenta that can be life-threatening to the mother, and uterine rupture that can result in permanent neurologic damage or death of the baby or, less commonly, hysterectomy or death of the mother. These risks are about the same or less than the risks of placental abruption, fetal distress, or cord prolapse, which can have tragic outcomes and whose possibility does not prevent some people from having homebirths. In other words women having homebirths (or hospital births) accept that there are some uncommon/rare conditions that might threaten the life or health of themselves or their babies. If you choose a homebirth, I will do everything I can to provide skillful midwifery care, and to transport to the hospital if a riskier situation develops, but in no way can I predict the outcome or make guarantees.

In my practice I have written protocols that insure that I provide consistent care in a given situation. The VBAC protocol includes: that you have had only one previous cesarean, that we review the operative note from your surgery to confirm a low-transverse scar, that you have an ultrasound between 28-33 weeks to learn the location of the placenta within the uterus, and that the travel time to the hospital be less than 10 minutes. There are a few other items that are part of my VBAC protocol that are just slightly different from what I do at every birth. I will go over these with you if you like.

There are some things that we do know about VBACs (and birth in general). A spontaneous labor with midwifery care is usually safer than a stimulated labor with typical obstetrical management. An unmedicated labor is safer than an epidural anesthetic. A successful VBAC is safer than a scheduled repeat c-section, which is safer than a repeat c-section after hours of labor. Women who have the vaginal birth that they dream of are often fulfilled and empowered in ways that are hard to imagine.

At the end of this process, no one can guarantee that you and your baby will be healthy. Not at home, not in the hospital. Not with a midwife, not with a doctor. Not with a VBAC, not with a repeat cesarean. As they say

in midwifery circles, "Birth is as safe as life gets."
I choose a vaginal birth after cesarean at home with a midwifeI choose a vaginal birth after cesarean in hospital with a nurse-midwifeI choose a vaginal birth after cesarean in hospital with an obstetricianI choose a repeat cesarean section.

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