

Vaginal Birth after Cesarean (VBAC) and a Trial of Labor after Cesarean (TOLAC): A Changing Attitude

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Abstract

"Once a cesarean always a cesarean" is a very old saying by most of the prominent obstetricians throughout the twentieth century. The studies in the last two decades of twentieth century suggested that this practice may not always be necessary. Options for a patient with previous cesarean are Elective repeat cesarean Delivery (ERCD) also called ERCS (Elective Repeat Cesarean Section) and Trial of labor after cesarean (TOLAC). This can have 2 outcomes wise successful TOLAC – Vaginal Birth after Cesarean Delivery (60 to 80%) or failed TOLAC- Emergency cesarean Delivery. The benefits of a trial of labor after cesarean (TOLAC) resulting in a vaginal birth after cesarean (VBAC) may include lower rates of maternal morbidity due to Postpartum fever, Wound infection, Blood transfusion, Hysterectomy, Maternal discomfort, Length of stay etc. and Fewer cases of neonatal respiratory distress. The National Institute of health is planning to organize a "consensus development conference" in 2010 to minimize some confusion & to arrive at a decision & to elucidate current knowledge on VBAC even though there complications like uterine rupture.

Keywords: Vaginal Birth after Cesarean (VBAC); Trial of Labor after Cesarean (TOLAC); Elective Repeat Cesarean Delivery (ERCD); Repeat Cesarean Delivery (RCD).

Introduction

"Once a cesarean always a cesarean"

In 1916 Cragin made his famous oft-quoted and now seemingly excessive pronouncement, "Once a cesarean always a cesarean." Few issues in modern obstetrics have been as controversial as management of the woman who has had a prior cesarean delivery. For many decades, a scarred uterus was believed by most to contraindicate labor out of fear of uterine rupture. Vaginal birth after cesarean (VBAC) describes vaginal delivery by a woman who has had

a previous cesarean delivery. For most of the twentieth century, once a woman had undergone a cesarean delivery, clinicians believed that her future pregnancies required cesarean delivery. Studies from the 1960s suggested that this practice may not always be necessary.

Background

Cragin's dictum in 1916 quoted *"once a cesarean, always a cesarean"*. In 1910, Mason and Williams, the strength of healed cesarean section scars of guinea pigs & cats tested by subjecting to increasing weights

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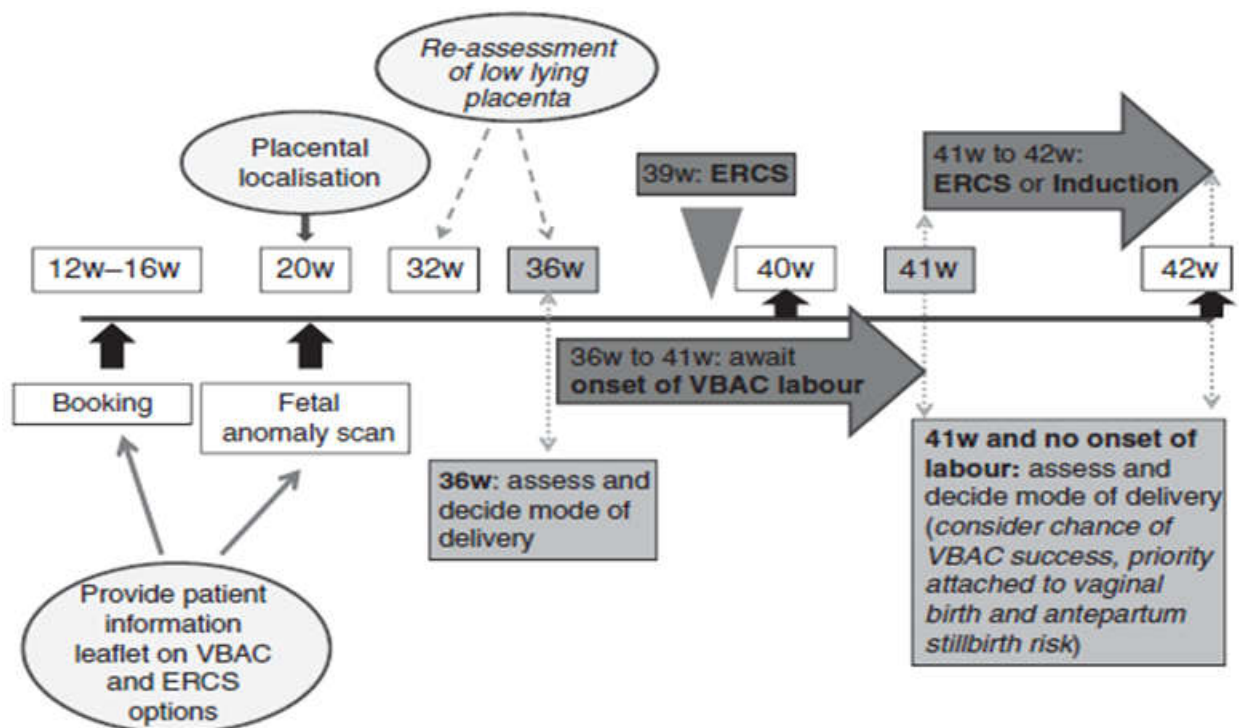
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and also rupture was noted in the muscle but not the scar in 100% cases. Kerr's low transverse uterine incision (1921) reduced maternal mortality from sepsis & hemorrhage and gave greater strength to healed incision site. Cragin himself witnessed VBAC in a woman in whom he did the cesarean. (NY Med. 1916;104:1-3). Rethinking the Dictum: Case in 1930s gave an excellent review on VBAC showing 70% success rate in British population. (J ObstetGynaecol Br Commonw. 1971;78:203-14). In U.S., till 1970, patients with previous cesarean were mostly delivered by elective repeat cesarean, leading to Five-fold increase in rate of cesarean deliveries. From 1980 onwards, reappraisal of the situation, careful selection of candidates for VBAC began, and First guideline was formed by ACOG in 1999.

Studies done after 1960, the dictum "once a cesarean, always cesarean" no longer applies. It appears that many women who have previously undergone cesarean delivery can safely attempt a trial of labor to have a vaginal delivery in subsequent pregnancies. The following are important definitions regarding vaginal birth after cesarean (VBAC) delivery:

- A trial of labor after cesarean (TOLAC) is a planned attempt to labor by a woman who has previously undergone a cesarean delivery and desires a subsequent vaginal delivery.

Determining the Mode of Delivery



- A VBAC is a "successful" trial of labor resulting in a vaginal birth.
- A TOLAC may result in either a "successful" VBAC or a "failed" trial of labor resulting in a repeat cesarean delivery.
- A repeat cesarean delivery (RCD) may be planned and scheduled beforehand and thus is an elective repeat cesarean delivery (ERCD). If the woman who plans an ERCD enters spontaneous labor before the scheduled date, this is still considered an ERCD even if delivery is unscheduled. The woman with a failed TOLAC undergoes a RCD that is unplanned and unscheduled.

Options for a Patient with Previous Cesarean

- Elective repeat cesarean Delivery (ERCD) - Also called ERCS (Elective Repeat Cesarean Section)
- Trial of labor after cesarean (TOLAC)

This can have 2 Outcomes

- Successful TOLAC - Vaginal Birth after Cesarean Delivery (60 to 80%)
- Failed TOLAC - Emergency cesarean Delivery

Antenatal Assessment & Counseling

Points to be discussed	Special considerations
Make patient understand the maternal & perinatal risks & benefits of VBAC V/S ERCD	Assess patient's attitude towards the rare but serious adverse outcomes
Presence of contraindications to VBAC	Any complicating obstetric factors
Likelihood of a successful VBAC.	-Placenta previa
Her plans for future pregnancies.	- Fetal Malpresentations
Personal preference & motivation to achieve vaginal birth or ERCD.	- Cervical fibroid
	- Maternal medical disorders
	- Previous classical scar
	- Previous uterine rupture
	- Previous peri-operative complications if any
	- Unknown scar, etc.
	Mostly if previous vaginal birth/successful VBAC

Selection of Candidates for Vaginal Birth after Cesarean Delivery (VBAC)

ACOG: approved VBAC candidates

- Previous one LSCS
- Clinically adequate pelvis
- No other uterine scar / previous rupture
- Physician immediately available throughout active labor, capable of monitoring labor, performing an emergency cesarean delivery
- Availability of anesthesia & personnel for emergency cesarean delivery
- Vertex fetal presentation

Benefits of Vaginal Birth after Cesarean

The benefits of a trial of labor after cesarean (TOLAC) resulting in a vaginal birth after cesarean (VBAC) include the following:

1. Lower rates of maternal morbidity
 - Postpartum fever
 - Wound infection
 - Blood transfusion
 - Hysterectomy
 - Maternal discomfort

Risk factors for uterine rupture during TOL

• Maternal age > 30	Type of C-section
• Fetal weight > 4000 grams	• Classical incision (4 - 9%)
• Induction of labor	• T-shaped incision (4 - 9%)
• No previous history of vaginal delivery	• Low vertical incision (1 - 7%)
• Previous C-section due to dystocia	• Low transverse incision (0.2 - 1.5%)

Contraindication to trial of labor after cesarean (TOLAC)

Related to Previous Cesarean Delivery

- Length of stay
 - 2. Fewer cases of neonatal respiratory distress
- Risks of Vaginal Birth after Cesarean*
- The risks of an attempted VBAC or TOLAC include the following:
- Risk of failed trial of labor after cesarean (TOLAC) without a vaginal birth after cesarean (VBAC) resulting in repeat cesarean delivery (RCD) in about 20 to 40 percent of women who attempt VBAC.
 - Risk of rupture of uterus resulting in an emergency cesarean delivery. The risk of uterine rupture may be related in part to the type of uterine incision made during the first cesarean delivery.
 - While women who attempt TOLAC and VBAC have a low risk of uterine rupture, the risk of uterine rupture is higher with VBAC than with RCD
 - The risk of fetal death is very low with both VBAC and elective repeat cesarean delivery (ERCD), but the likelihood of fetal death is higher with VBAC than with ERCD. Maternal death is very rare with either type of delivery.

- Previous classical or T /J shaped uterine incision
- Previous uterine rupture
- Uterine surgeries involving full muscle thickness

(Hysterotomy, Preterm LSCS, myomectomy with cavity opened. No consistent evidence available for incidence of uterine rupture in Laparoscopic v/s open myomectomy)

- Previous >2 LSCS (VBAC in previous 3 LSCS has been
- Reported as early as in 1979 but not enough evidence available)
- Unknown scar – In the absence of previous operative records, a detailed history may be taken

Most common incision, however is, low transverse & VBAC is reasonable, *Obstet Gynecol.* 1994; 84:255–258

Obstetric or Medical Complication

- Malpresentation
- Antepartum hemorrhage- Placenta previa, Placenta accreta
- Severe PIH/eclampsia
- Placental insufficiency (IUGR, Oligohydramnios)

Predicting the success v/s failure of Trial of Labor (ACOG practice bulletin 2010)

Increased probability of success of TOLAC	Decreased probability of success
Prior vaginal birth	Recurrent indication for initial cesarean delivery (Dystocia, CPD)
Spontaneous onset of Labor	Increased maternal Age
	Nonwhite ethnicity
	Gestational age > 40 weeks
	Maternal obesity and Pre-eclampsia
	Short inter-pregnancy interval
	Increased neonatal birth weight

Recommendations to Midwives Doing Home VBACs

1. Learn about the physical and psychological differences in a woman with a previous cesarean.
2. Define the comfort zone of the practitioner to attend VBACs.
3. 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 the transport time to the nearest hospital with emergency C-section capabilities, and the time for that hospital to initiate emergency

- Medical disorders like HTN, Heart disease, Renal disease, Asthma, Seizure disorders, Thyroid disorders

(Grobmann et al – Inconsistent evidence, VBAC can be given)

- Contracted pelvis/CPD
- Inability to perform emergency cesarean due to insufficient staffing / facilities

Success rates for attempted VBAC

- 50-70% of attempted VBACs result in successful vaginal birth
- Factors making VBAC success more likely:
 - Previous vaginal delivery
 - Favorable cervix/Bishop score
 - Spontaneous onset of labor
 - Breech presentation as reason for previous C-section (85% success)

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.

7. Decide in advance if your VBAC protocol is negotiable or not.

Induction of labor in attempted VBAC

- Spontaneous labor is most successful & has lowest rate of uterine rupture
- Misoprostol should never be used
- Rates of rupture shown in U.W. study (2001 NEJM) differed by method of induction:
- Spontaneous labor - 0.52%

- Induction without prostaglandins - 0.72%
- Induction with prostaglandins – 2.45%

Cervical Ripening & Labor Stimulation

- Two to three fold increased risk of uterine rupture & 1.5 fold increased risk of C.S in induced &/ augmented labor than spontaneous labor in VBAC.
- So oxytocin should be used with extreme caution & only when uterine activity is clearly inadequate & great care should be taken to avoid uterine hyperstimulation.
- Prostaglandins for cervical ripening are associated with increased risk of scar rupture during VBAC.
- Rupture rate clearly higher than spontaneous labor in most of the studies.
- Thus ACOG (2004), discourages the use of prostaglandin analogues for cervical ripening or labor induction during VBAC.
- 2nd stage of labor is the period of maximum strain to the lower uterine segment, so...
- If 2nd stage is prolonged & head is low in the pelvis –this may be shortened with assisted vaginal delivery, by forceps or by vacuum.
- 3rd stage is usually uneventful.
- Routine exploration of uterine scar after delivery is no longer recommended, because cases needs surgical repair are almost invariably symptomatic.
- Woman must be observed intensely in early postpartum period for any signs of scar rupture.

Conduction of Labor in VBAC

- Take detailed informed written consent
- To be conducted in a suitably staffed & equipped setting with the facility for emergency cesarean delivery 24x7 & neonatal resuscitation
- An Obstetrician, Anesthesiologist & pediatrician should be immediately available
- PGE 2 may be used to induce labor with caution.
- IV access, adequate blood cross matched
- Monitor maternal BP, PR & ST every 15 min
- Continuous fetal monitoring by CTG (II A)
- Intrauterine pressure catheters - not routinely useful
- Oxytocin should be used with caution (In AIIMS - low dose, starting from 1mIU/ min is being used for augmentation)
- No contraindication for epidural analgesia – does not reduce success or mask signs of rupture
- Regular review of partogram by senior obstetrician
- Routine postpartum exploration of scar - not needed

Maternal Complications

Complication	TOL	ERCD	Normal labor
Uterine rupture	0.7%	0	0.012% (Gradeil F et al,ur J ObstetGynecolReprod Biol. Aug 1994)
Uterinedehiscence	0.7%	0.5%	
Hysterectomy	0.2%	0.3%	0.14% ACOG2002
Thromboembolic disease	0.04%	0.1%	
Transfusion	1.7%	1%	
Endometritis	2.9%	1.8%	1-2% Parkland Hospital
Maternal deaths	0.02%	0.04%	
Other adverse events(broad-ligament hematoma, cystotomy, bowel injury, and ureteral injury)	0.4%	0.3%	

Maternal complications and VBAC & failure TOLAC rates

	VBAC	Failed TOLAC
Uterine rupture	0.1%	2.3%
Uterine dehiscence	0.1%	2.1%
Hysterectomy	0.1%	0.5%
Transfusions	1.2%	3.2%
Endometritis	1.2%	7.7%
Thromboembolic diseases	0.1%	0.02%
Maternal death	0.01%	0.04%
Other maternal adverse events	0.01%	1.3%

Critical Gaps for Decision-Making by Researchers

1. There is a need for uniform and simple-to-use definitions that would be common to all data collection.
2. There appear to be persistent racial/ethnic, geographic, and socioeconomic differences in the rate of trial of labor and VBAC compared with elective repeat cesarean delivery.
3. The factors that affect the course of labor and its clinical management are incompletely understood.
4. Comparative long-term maternal and perinatal biological and psychosocial outcomes following VBAC, unsuccessful trial of labor, and elective repeat cesarean delivery are not well understood.
5. The comparative effects that VBAC, unsuccessful trial of labor, and elective repeat cesarean delivery have on breastfeeding practices are not well understood.
6. A variety of nonmedical factors affects the availability and management of trial of labor, but they have not been well studied. Access to safe trial of labor appears to be restricted by factors such as geography, workforce availability and training, professional association guidelines, type of maternity care provider, liability concerns, health insurance, and institutional policy.
7. The current medical-legal environment—including provider perceptions of and experience with professional liability – exerts a chilling effect on the availability of trial of labor.
8. The informed consent process for trial of labor and elective repeat cesarean delivery should be evidence-based, minimize bias, and incorporate a strong emphasis on the values and preferences of pregnant women.
9. National and state-level surveillance of factors associated with trial of labor are lacking.
10. There is insufficient information on factors increasing VBAC among low-risk women.

*ACOG Guidelines: ACOG Practice Bulletin 2010**Level A Evidence*

- Most women with previous one LSCS are candidates for VBAC & Should be counseled about VBAC & offered TOLAC
- Epidural analgesia for labor may be used as part of TOLAC
- Misoprostol should not be used for 3rd trimester

cervical ripening or labor induction in patients with previous cesarean delivery or major uterine surgeries.

Level B Evidence

- VBAC is recommended in previous two LSCS with low transverse scar and previous one LSCS with twins.
- ECV for breech is not contraindicated in previous LSCS.
- Scars other than low transverse/ low vertical scars or those in whom vaginal delivery is contraindicated (eg. Placenta accreta) are contraindications for VBAC.
- Induction of labor for maternal/fetal indication remains an option.
- Previous unknown uterine scar is not a contraindication unless there is high suspicion of classical cesarean delivery.

Summary

“Best answer” for a given woman with a prior C.S is probably unknown. The decision to attempt VBAC is complex, requires careful counseling & should take into consideration: Maternal preferences & priorities, plans for future pregnancies, Presence of factors that influence likelihood of success Vs. scar rupture and importance placed on rare but serious adverse outcomes. The National Institute of health is planning to organize a “consensus development conference” in 2010 to minimize some confusion & to arrive at a decision & to elucidate current knowledge on VBAC.

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