Trial of Labor after Cesarean Section

Providing Safe Care During Labor

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September, 2018
Objectives

- Review current guidelines and recommendations for pregnant women with prior cesarean birth

- Cite factors associated with uterine rupture during TOLAC that pose additional risks for the mother and fetus

- Discuss roles and responsibilities of the entire perinatal team aimed to optimize patient safety and outcomes for mother and the fetus
Background

- 1970 US C/S rate was 5%
- FM ➔ C/S ➔ “once a cesarean always a cesarean”
- By 1980 the US C/S rate ↑ 16.5% -
- NIH recommends attempt VBAC (encouraged often required)
- By 1996 women were commonly offered TOLAC
  - VBAC rates increased to 28.3% (women offered TOLAC)
  - C/S rates ↓ for the first time
  - Uterine rupture rates significantly increased
    - Widely published reports of poor outcomes
- By 2006 VBAC rate decreased to 8.5% (90% ERCS)
- 2012 Total C/S rate is > 33%
- In some hospitals TOLAC is no longer offered
Why Should We Care?

- Rise in total CS rate without maternal or neonatal benefit
  - 6% in early 70’s
  - 20% in mid 80’s
  - 33% in 2010
  - Cerebral Palsy rates, neonatal seizure rates unchanged since 1980
Rates of Total – Primary - VBAC

Data from http://www.cdc.gov/nchs/nvss.htm
FACTS

For women with prior CB

• Successful TOLAC ➔ VBAC lowest risk of adverse outcomes
• **Unsuccessful** TOLAC ➔ higher rates of adverse outcomes
• Prior uterine scar is most common reason for ERCB (~33%)
• US VBAC success rates are between 59.1% – 79.5%
• Some co-morbidities are associated with failed TOLAC
• Prediction tools DO NOT consistently identify women who fail
Cesarean: Maternal Risks

**Acute**

Common:
- Longer hospital stay
- Increased pain and fatigue
- Postpartum hemorrhage (transfusions ~2%)
- Slower return to normal activity and productivity
- Delayed or difficult breastfeeding

1/100 to 1/1000
- Anesthesia complications
- Wound infection
- Deep vein thrombosis

**Long Term & Subsequent Births**

1/100 to 1/1000
- Abnormal placentation (previas and accretas)
- Uterine rupture
- Surgical adhesions
- Bladder surgical injury
- Bowel surgical injury
- Bowel obstruction

*We perform over 160,000 Cesareans every year in California*
Cesarean: Neonatal Risks

- Increased neonatal morbidity
  - Impaired neonatal respiratory function
  - Increased NICU admissions
  - Affects maternal-newborn interactions including breastfeeding
  - No reduction in cerebral palsy rates
Why is TOLAC out of Favor?

- Fear
  - MD, Patient
- Inconvenience
  - MD’s: OB, Anesthesiologist
- Cost
  - Providers
  - Insurance companies
  - Medical legal pay outs
Background Facts

- IN 2010 the NIH examined the safety and outcomes of TOLAC
- Ø RCT’s comparing outcomes of TOLAC v/s Repeat C/S
- Instead ➔ recommendation regarding approach to delivery
  - Based on observational data and probability of achieving VBAC
- Data was summarized in a report for the NIH conference
- A scoring system was created:
  www.bsc.gwu.edu/mfmu/vagbirth.html
Factors Associated with Uterine Rupture

- Previous uterine surgery
- High dose Oxytocin
- Prostaglandins
- Hyperstimulation Grand Multiparity
- Blunt or penetrating trauma
- Abnormal fetal lie
- Previous terminations of pregnancy
- Vigorous pressure on the uterus at birth
FACTS:
Uterine Rupture

- Catastrophic Event
  - woman and the fetus
- During TOLAC there is a 1-2% risk of uterine rupture (UR)
- Women who undergo Elective C/S have UR risk of 0.2%
- There is no reliable way to predict uterine rupture
- Intrapartum fetal death in the setting of UR is 1/5,000
- Insufficient evidence exists to quantify neonatal morbidity
The MFMU Network embarked upon a prospective cohort from 1999 – 2003

19 Academic medical centers
MFMU Findings
Landon et a., 2016 Seminars in Perinatology

▪ The success rate for obese women was lower

▪ **Success Factors** include:
  - BMI < 30
  - Cervical status
  - Need for induction
  - Presence of preeclampsia
  - Multiple prior C/S

▪ **Prediction model calculator on-line at**
  https://mfmunetwork.bsc.gwu.edu/PublicBSC/MFMU/VGBirthCalc/vagbirth.html
Counseling for TOLAC

- Discuss most common complications
  - Include both TOLAC and Repeat CD
  - Likelihood of success
  - Plans for future childbearing
    - Include risk of multiple C/S: Previa and Accreta

- Provide truly informed choice for the woman
- Strive for shared decision making
Decision Tools for Pregnant Women with Prior CB

Eden, K., et al., 2014 JOGNN
Hallmark Sign of Uterine Rupture

Intrapartum:

- Cardinal sign is acute FHR bradycardia

- Some authors have reported variable and late decels and others have not found any difference in the number of decels when UR is compared to women in labor without UR

Vaginal Birth after Previous Cesarean Delivery

• TOLAC – trial of labor after previous cesarean delivery
  • Fulfills woman’s preference for vaginal birth
    • maternal / neonatal morbidity
    • complications with future pregnancies
  • Assess individual risks v/s likelihood of VBAC
    • appropriate candidate selection
Top 10 Considerations for Success

1. Prior incision was low transverse
2. Clinically adequate pelvis and normal fetal size
3. No other uterine scars, anomalies, or pervious rupture
4. Previous vaginal delivery
5. Patient enthusiasm informed consent
6. Spontaneous labor
7. Dilated cervix
8. Physician available capable of monitoring labor and the fetus and performing a cesarean
9. Anesthesia, blood bank, and staff available
10. Simulation training for emergency cesarean delivery
Caution and Potential Contraindications

- Prior or classical or T-shaped incision or previous fundal surgery
- Contracted pelvis, macrosomia, or both
- Recurrent indication for initial cesarean delivery

High risk uterine incisions (not VBAC candidates)
Caution and Potential Contraindications

- Medical or obstetric condition precluding vaginal delivery
- Patient refusal
- Induction with unfavorable cervix
- Augmentation of labor Inability to perform emergency cesarean delivery
True Contraindications

- Induction with unfavorable cervix
  - Increased risk of uterine rupture compared with women with spontaneous labor or induction with oxytocin.

(Sanchez-Ramos, 2005; ACOG, 2002a0c).

➤ Not recommended
<table>
<thead>
<tr>
<th>Society</th>
<th>VBAC Counseling</th>
<th>Facilities and Personnel</th>
<th>Other Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>The College⁴</td>
<td>VBAC should be offered to most women with one previous cesarean delivery with low transverse incision; consider those with two previous low transverse cesarean deliveries.</td>
<td>Safest where staff can provide immediate emergency cesarean delivery, but patients should be allowed to accept increased risk when such resources are not available.</td>
<td>Twins, macrosomia, postdatism, low vertical incision, and unknown type of uterine incision should not preclude.</td>
</tr>
<tr>
<td>RCOG⁵</td>
<td>Women with one prior low segment cesarean delivery should be able to discuss option of VBAC; final decision between woman and her obstetrician.</td>
<td>Should be conducted in suitably staffed and equipped delivery suite with continuous intrapartum care and monitoring and available resources for immediate cesarean delivery and advanced neonatal resuscitation.</td>
<td>Caution with twins and macrosomia (uncertainty due to underpowered studies).</td>
</tr>
<tr>
<td>SOGC⁶</td>
<td>VBAC should be offered to women with one previous cesarean delivery with low transverse incision.</td>
<td>In hospital where a timely cesarean is available; an approximate timeframe of 30 min should be considered adequate for urgent laparotomy.</td>
<td>Twins, macrosomia, and postdatism are not contraindications.</td>
</tr>
<tr>
<td>AAFP⁷</td>
<td>VBAC should be offered to women with one previous cesarean delivery with low transverse incision.</td>
<td>Should not be restricted only to those facilities with available surgical teams present throughout labor because there is no evidence that these additional resources result in improved outcome.</td>
<td>Not addressed.</td>
</tr>
<tr>
<td>AHRQ²</td>
<td>VBAC is a reasonable choice for the majority of women with prior cesarean delivery.</td>
<td>Not addressed.</td>
<td>Not addressed.</td>
</tr>
</tbody>
</table>

VBAC, Vaginal Birth After Cesarean Delivery; The College, American College of Obstetricians and Gynecologists; RCOG, Royal College of Obstetricians and Gynaecologists; SOGC, Society of Obstetricians and Gynaecologists of Canada; AAFP, American Academy of Family Physicians; AHRQ, Agency for Healthcare Research and Quality.
What about Induction of Labor for women who desire TOLAC

- Longer latent phase
- Similar active phase
- Clinician should use the same normative standards for labor treatment of women without previous CD that has been shown in previous work
**TOLAC**

- Continuous fetal monitoring
- IV access
- Close attention to labor progress
- Patient’s perception of pain – suprapubic/ stabbing
- Unmasked by epidural analgesia
- Significant neonatal morbidity after 18 minutes
- Maternal and fetal survival depends on prompt recognition and surgical intervention
Uterine Rupture: Definitions

- The actual separation of the uterine myometrium or previous uterine scar with rupture of membranes and possible extrusion of the fetus or fetal parts into the uterine cavity.
- Dehiscence refers to a separation of the old scar, usually partial with intact membranes, fetus remains inside the uterus.
Uterine Rupture

Warning Signs of Uterine Rupture

- **FHR Tracing:** classic pattern evolution v/s rapid progression CAT III
- **PAIN:** acute, severe, constant, stabbing abdominal pain
- **Loss of fetal station**
  - **Bleeding:** Heavy vaginal bleeding verses minimal
  - **Vital Sign/Clinical Maternal Change:** tachycardia and/or hypotension
Uterine Rupture

- Rapid pattern evolution:
  - Variable decelerations
  - Recurrent deep decelerations
  - Loss of variability
  - Bradycardia
Uterine Rupture: Medical Legal Risks

• Many VBAC lawsuits hinge on alleged:
  ➢ Inappropriate use of oxytocin
  ➢ Failure to interpret the FHR tracing
  ➢ Failure to perform a timely C/S
Patient Safety Concerns

- Follow your guidelines: induction of labor, cervical ripening, oxytocin
  - What does that mean at St. Joseph Eureka?
  - Where do you see potential risks for women who desire TOLAC?
  - What can be done to keep patients as safe as possible?
Assess the likelihood of VBAC including individual risks

Review Risks and Benefits of TOLAC in various clinical settings

Provide practical guidelines for counseling patients and managing women who desire vaginal birth after cesarean delivery
# Table 1. Composite Maternal Risks From Elective Repeat Cesarean Delivery and Trial of Labor After Previous Cesarean Delivery in Term Patients

<table>
<thead>
<tr>
<th>Maternal Risks</th>
<th>ERCD (%) [One CD]</th>
<th>TOLAC (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infectious morbidity</td>
<td>3.2</td>
<td>4.6</td>
</tr>
<tr>
<td>Surgical injury</td>
<td>0.30–0.60</td>
<td>0.37–1.3</td>
</tr>
<tr>
<td>Blood transfusion</td>
<td>0.46</td>
<td>0.66</td>
</tr>
<tr>
<td>Hysterectomy</td>
<td>0.16</td>
<td>0.14</td>
</tr>
<tr>
<td>Uterine rupture</td>
<td>0.02</td>
<td>0.71</td>
</tr>
<tr>
<td>Maternal death</td>
<td>0.0096</td>
<td>0.0019</td>
</tr>
</tbody>
</table>
Table 2. Composite Neonatal Morbidity From Elective Repeat Cesarean Delivery and Trial of Labor After Previous Cesarean Delivery in Term Infants

<table>
<thead>
<tr>
<th>Neonatal Risks</th>
<th>ERCD (%)</th>
<th>TOLAC (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antepartum stillbirth</td>
<td>0.21</td>
<td>0.10</td>
</tr>
<tr>
<td>Intrapartum stillbirth</td>
<td>0–0.004</td>
<td>0.01–0.04</td>
</tr>
<tr>
<td>HIE</td>
<td>0–0.32</td>
<td>0–0.89</td>
</tr>
<tr>
<td>Perinatal mortality</td>
<td>0.05</td>
<td>0.13</td>
</tr>
<tr>
<td>Neonatal mortality</td>
<td>0.06</td>
<td>0.11</td>
</tr>
<tr>
<td>NICU admission</td>
<td>1.5–17.6</td>
<td>0.8–26.2</td>
</tr>
<tr>
<td>Respiratory morbidity</td>
<td>2.5</td>
<td>5.4</td>
</tr>
<tr>
<td>Transient tachypnea</td>
<td>4.2</td>
<td>3.6</td>
</tr>
</tbody>
</table>
ACOG PB # 184
Vaginal Birth after Cesarean Delivery 2017

- Most published findings demonstrate 60-80% successful VBAC
- No prediction model has been shown to improve pt outcomes
- External cephalic version is not contraindicated
- 2 prior LT cesarean deliveries is reasonable
- An upper oxytocin limit has not been established
- Epidural is not considered necessary
- Continuous fetal monitoring by staff who are familiar with complication of TOLAC
- Postpartum bleeding or signs of hypovolemia may indicate uterine rupture and requires complete MD evaluation of genital tract
Uterine Rupture:
Medical Legal Risks

• Many VBAC lawsuits hinge on alleged:
  ➢ Inappropriate use of oxytocin
  ➢ Failure to interpret the FHR tracing
  ➢ Failure to perform a timely C/S
Labor & Delivery: A Unique Domain

ED + OR + ICU + NICU = L&D

- High stakes
- High payouts
Case Review

- 34 yo G₂P₁ Hx of C/S in 2014 (Breech)
- Scheduled for Repeat C/S in 4 days (39 +0)
- Arrives to L&D at 08:00 am contracting (38+5)
  - VE: 2/80/-2
Call for Help Early

Who responds?
- Rapid Response Team?
  - What is the SBAR?
  - What is their role?
  - Who is leader?

I wonder why we were called?

Gee...she looks pretty good to me...
Surgical Emergency

- STAT Cesarean
  - No counts
  - No standard prep
- 2nd IV
- Blood transfusion
- GYN/Onc Surgeon
- Baby to NICU – cooling
- Emotional support for partner/ family
Prompt neonatal resuscitation
Appendix Q
Example Algorithm for the Management of Intrapartum Fetal Heart Rate Tracings

Category 1
- Moderate variability w/o late or variable decels
  - May observe
  - May observe. Apply corrective measures* and scalp stimulation
    - Acceleration or return of mod variability
      - Cautiously observe. Increase frequency of assessments
    - Notify provider. Repeat scalp stimulation every 20-30 minutes. If pattern persists for 60 min without accelerations or return to moderate variability, then begin prep for urgent delivery

Category 2
- Non-clinically significant decels* in the presence of marked or mod variability or accels
- Minimal variability w/ clinically significant decels for > 50% of contractions; OR absent variability w/o decels
  - Apply corrective measures** and scalp stimulation
    - No acceleration or return of mod variability
      - If abnormal pattern persists or returns
        - Notify provider. Repeat scalp stimulation every 20-30 minutes. If pattern persists for 60 min without accelerations or return to moderate variability, then begin prep for urgent delivery

Category 3
- Minimal variability w/ clinically significant decels for 30 min
  - Begin prep for urgent delivery and initiate corrective measures** and scalp stim if not already done
  - Begin transport to OR by 3 min. Deliver without delay should decel persist > 10 min
  - If no improvement, deliver within 30 min
- Prolonged decel ≤ 60 BPM (or ≤ 80 BPM if remote from delivery)
- Absent variability w/decels or w/ bradycardia (baseline rate < 110 BPM); or sinusoidal pattern
  - Begin prep for urgent delivery and initiate corrective measures** and scalp stim if not already done
  - Begin prep for urgent delivery
**Clinically significant decelerations include:**

- Variable decels lasting > 60 sec with a nadir > 60 BPM below baseline
- Variable decels > 60 sec with a nadir < 60 BPM regardless of baseline
- Late decels of any depth
- Any prolonged decel as defined by NICHD


**Corrective measures include:**

- Oxygen administration
- Maternal position change
- Fluid bolus
- Reduction or discontinuation of pitocin
- Administration of terbutaline for tetanic contraction or tachysystole
- Administration of pressors, if hypotension present
- Amnioinfusion for deep, repetitive variable decelerations

(Miller LA, Miller DA. *J Perinat Neonatal Nurs.* 2013;27(2):126-133.)
Response

1. Begin prep for urgent delivery and initiate corrective measures** and scalp stim if not already done

2. Begin transport to OR by 3 min. Deliver without delay should decel persist > 10 min

3. If no improvement, deliver within 30 min
Clark’s Algorithm for Management of Cat II Tracings
Available in Toolkit

Algorithm for management of category II fetal heart rate tracings

- Moderate variability or accelerations
  - Yes
    - Significant decelerations with ≥50% of contractions for 1 hour*
      - Yes
        - C-section
      - No
        - Active Phase
          - Normal labor progress
            - No
              - C-section
            - Yes
              - Observe
          - Normal progress
            - No
              - C-section
            - Yes
              - C-section or OVD
  - No

- Significant decelerations with ≥50% of contractions for 30 minutes*
  - Yes
    - Observe for 1 hour
  - No
    - Persistent pattern
      - Yes
        - C-section or OVD
      - No
        - C-section or OVD

*CVD, operative vaginal delivery.
*That have not resolved with appropriate conservative corrective measures, which may include supplemental oxygen, maternal position changes, intravenous fluid administration, correction of hypotension, reduction or discontinuation of uterine stimulation, administration of uterine relaxant, amnioninfusion, and/or changes in second stage breathing and pushing techniques.

Debriefing as a Strategic Tool for Performance Improvement  Corbett, et al., 2012

• 4 ⇒ 14 Kaiser Hospitals
  • Establish high reliability units
  • Improve communication, teamwork and system
  • Create a “Just Culture”

• Standardized debriefing for critical events
  • Apgar ≤ 6 at 5 minutes
  • Intrapartum fetal demise
  • Emergency Cesarean Section
  • Postpartum Hemorrhage
  • Seizure
  • Preterm delivery on antepartum unit
  • Shoulder Dystocia (beyond McRoberts/Suprapubic)
  • Unexpected maternal transfer to higher level of care
  • Unexpected term infant admission to NICU
Promote High Reliability

- Lucky verses Good
- By conducting a drill:
  - TOLAC → Uterine Rupture → Fetal Bradycardia → STAT C/S
- You can actually test your department’s capability to handle a rare obstetrical or neonatal emergency
- Measure outcomes in minutes
  - **Time** from MD notification to bedside
  - **Time** entered the OR
  - **Time** of birth after bradycardia began
  - **Quality of neonatal resuscitation**
  - **Time** of Pediatrician arrival
The Principles of the Program
Behavioral Skills (CRM)

• Know your environment
• Anticipate and plan
• Assume the leadership role
• Communicate effectively
• Distribute work load optimally

• Allocate attention wisely
• Utilize all available information
• Utilize all available resources
• Call for help early enough
• Maintain professional behavior
COMMITTEE OPINION

• Number 590 • March 2014 (Replaces Committee Opinion Number 487, April 2011)

• Committee on Patient Safety and Quality Improvement

• This document reflects emerging concepts on patient safety and is subject to change. The information should not be construed as dictating an exclusive course of treatment or procedure to be followed.
Examples of Tools for Managing Clinical Emergencies

- Availability of appropriate emergency supplies in a resuscitation cart (crash cart) or kit
- Development of a rapid response team
- Development of protocols that include clinical triggers
- Use of standardized communication tools for huddles and briefs (e.g., SBAR)
- Implementation of emergency drills and simulations

Abbreviation: SBAR, Situation–Background–Assessment–Recommendation.
Traumatic Childbirth

“process that involves actual or threatened serious injury or death to the mother or her infant. The birthing woman experiences intense fear, helplessness, loss of control and horror”.

- Dehumanizing experience
  - High level of medical interventions, extreme pain
- Stripped of their dignity
- Powerless
- Lack of caring and support from perinatal staff
- Fear of dying

Case Study

- Infant discharged to home on hospital day #8
  - Normal MRI
  - No seizure activity on EEG
  - Normal eye exam
  - Breast and bottle feeding

- Patient seen in clinic at 6 week PP visit
  - Appears sad, worried about formula feeding
  - Verbalized hostility toward husband
    - “It was all his idea, I was fine with a repeat C/S”

- Patient seen at 10 weeks
  - Accompanied with a friend
  - Appeared to be coping more effectively than previous
  - Continued concern re breastfeeding and formula feeding
Critical Incident

“...A critical incident has been described as any sudden unexpected event that has the power to overwhelm the usual effective coping skills of an individual or a group and can cause significant psychological distress in usually healthy persons.”

– Roesler and Short, 2009
Critical Incident: Staff Responses

- An individual experience
- May be influenced by prior exposure/reactions to stressful events
- Guilt
- Fear
- Grief
- Difficulty concentrating
- Loss of sleep; restlessness
- Loss of appetite
- Headaches
- Panic symptoms
Critical Incident: Debriefing

What it is:

- An Opportunity for the Team:
  - To talk about what happened
  - To support each other
  - To begin to recover
- An opportunity for the nurse leader to identify ongoing needs
Preventing Malpractice Claims

- Spontaneous labor
- Normal labor progress continues
  - Without augmentation
- Absence of significant FHR abnormalities or other indications of fetal compromise
Monitoring Labor

- 20% - 40% of TOLAC is unsuccessful
- High risk for labor abnormalities **1:1 Nursing**
- Once labor begins call for OB Provider evaluation
- Continuous FHR monitoring
  - Scalp electrode early
  - IUPC not beneficial
- Heightened surveillance
  - Shoulder pain, anxiety, restlessness, dizziness, shock
Summary

- Common sense should prevail
  - Appropriate candidate selection – informed consent
- 24 hour personnel may not be practical for rural hospitals
  - Role of Charge Nurse, available staffing, financial costs on on-call
- Epidural is useful but not mandatory
  - Adequate pain relief may encourage women to choose TOLAC
  - Should not mask pain associated with uterine rupture
- Prostaglandins
  - Misoprostil is contraindicated
  - Cervidil heightened risk of rupture
- Oxytocin
  - Use with caution – least amount to achieve desired effect
- Ultrasound is unreliable to detect uterine rupture
- If rupture occurs implement emergency response
  - Multiple care teams, possible MTP
- Stabilize mother and evaluate infant for cooling
- Provide postpartum F/U and emotional support for women who required emergency CS
“Too often we under respond to abnormal vital signs and operate in a state of denial and delay. It is important to identify triggers and establish protocols that certain findings trigger a response.”

-Elliott Main, MD

CMQCC
Nurses are a valuable source of information and support for women and their families

Thank You

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