How safe is vaginal birth after cesarean section for the mother and fetus?

Paul Crawford, MD
Eglin Air Force Base Family Medicine Residency, Eglin AFB, Florida

Leonora Kaufmann, MLIS
Carolinas Health Care System, Charlotte, NC

EVIDENCE-BASED ANSWER

Compared with planned repeat low-transverse cesarean section, vaginal birth after cesarean section (VBAC) is not associated with increased risk of maternal or neonatal mortality (strength of recommendation [SOR]: **B**). Morbidity is slightly increased, as evidenced by higher uterine rupture rates and some neonatal outcome measures (SOR: **B**).

CLINICAL COMMENTARY

Risks of C-section and labor must be considered when counseling regarding route of delivery

Another question to pose is: how safe is repeat cesarean section for the mother and fetus? How much do morbidity and mortality increase with each new intra-abdominal procedure? Each time the belly is opened there is new scar, with increased likelihood of adhesions and potential for future bowel obstruction. Consider these risks when counseling regarding route of delivery. Risk of uterine rupture appears to be higher in trials of labor (and confers a statistically significant but small increase in morbidity but not mortality). However, the uterine scar can silently fail without labor—as is sometimes discovered at a scheduled repeat section, usually without untoward effects on mother or fetus.

Remember that you are sending a young woman home with a new baby to care for (along with other children) and a major abdominal procedure (through an old scar) to recover from, which one could certainly define as morbidity. Cesarean section is an important tool, but we must be careful to practice best possible care and consider all patient factors and preferences. And data are still lacking to support the notion that VBAC is unsafe.

Lynda DeArmond, MD
Waco Family Practice Residency Program, Waco, Texas

Evidence summary

Contrary to the goals of Healthy People 2010, the rate of cesarean sections is increasing.[1] The repeat cesarean rate for low-risk women of all ages and racial groups is now 88.7%, the highest rate since the Centers for Disease Control and Prevention (CDC) began tracking the statistic in 1989. Is VBAC safe, or is a trial of labor no longer supported by the data?

The most recent Cochrane Review found that both VBAC and repeat low-transverse cesarean section have benefits and risks associated with them; however, after reviewing the limited data, they concluded that no trial exists to adequately help women and their caregivers make an informed decision between the two.[2] A strong theme in the Cochrane Review, echoed in most reviews, was the

FAST TRACK

Vaginal birth after cesarean does not increase risk of mortality to the mother or infant; morbidity may be slightly increased

absence of high-quality prospective randomized data.

In an attempt to quantify the risks of VBAC, a systematic review determined that attempted VBAC, compared with repeat low-transverse cesarean section, increased the risk of uterine rupture by 2.7 per 1000 cases (95% confidence interval [CI], 0.73–4.73).[3] This additional risk rate is often quoted in VBAC reviews and was cited in the Agency for Healthcare Research and Quality evidence report; it is based on 1 prospective, nonrandomized cohort trial and 1 retrospective cohort study.[4,5]

No randomized controlled trials exist for determining maternal safety of VBAC, although another recent systematic review found 2 nonrandomized prospective trials of sufficient quality to analyze. The authors concluded there were "no statistically significant differences between planned elective repeat cesarean section and planned VBAC."[6] Upon closer review in PubMed, one of the cited studies did not study 312 patients for VBAC outcomes as alleged; rather, it investigated patient attitudes towards VBAC.[7]

Since publication of that review, a large, multicenter, prospective, nonrandomized trial involving 33,699 patients found no significant difference between VBAC and planned cesarean for hysterectomy (0.2% vs 0.3%; odds ratio [OR]=0.77; 95% CI, 0.51–1.17), maternal death (0.02% vs 0.04%; OR=0.38; 95% CI, 0.1–1.46), and neonatal death (0.08% vs 0.05%; OR=1.82; 95% CI, 0.73–4.57).[8] Significant associations were found for uterine rupture rates in spontaneous labor (24/6685 [0.4%] vs no cases; number needed to harm [NNH]=279) and neonatal hypoxic-ischemic encephalopathy (0.46 cases per 1000 vs no cases; NNH=2174).[8]

A retrospective Canadian cohort trial of 308,755 women also demonstrated an association of VBAC with uterine rupture (0.65% of trial-of-labor cases; OR=2.38; 95% CI, 2.12–2.67), and a trend towards higher maternal mortality in the cesarean group (1.6 per 100,000 for VBAC vs 5.6 per 100,000 for planned cesarean; OR=0.32; 95% CI, 0.07–1.47).[9]

The effect of VBAC on neonatal morbidity and mortality is unclear. In contrast to the negative larger trial,[8] a smaller retrospective cohort of 24,529 births found a higher association of perinatal death for trial of labor (adjusted OR=11.7; 95% CI, 1.4–101.6).[10] The perinatal death rate was similar to rates in nulliparous women. Regarding morbidity, one retrospective cohort trial showed VBAC was associated with an increase in neonatal sepsis (1% vs 0%; CI not given) compared with planned cesarean, but VBAC resulted in less transient tachypnea (5% vs 7%) and hyperbilirubinemia (2% vs 6%).[11]

Recommendations from others

Both the American College of Obstetricians and Gynecologists and the Society of Obstetricians and Gynecologists of Canada state that women with 1 previous low-transverse cesarean section should be offered a trial of labor after appropriate counseling of the risks and benefits.[12,13] Furthermore, induction with oxytocin is allowed, but the use of prostaglandins is not recommended. Based on expert opinion, both organizations encourage VBAC only in institutions staffed with surgeons and anesthesiologists immediately available to provide emergent cesarean.

REFERENCES

1. Menacker F. Trends in cesarean rates for first births and repeat cesarean rates for low-risk women: United States, 1990–2003. *Natl Vital Stat Rep* 2005; 54:1–8.
2. Dodd J, Crowther C, Huertas E. Guise J, Horey D. Planned elective repeat caesarean section versus planned vaginal birth for women with a previous caesarean birth. *Cochrane Database Syst Rev* 2005; (4):CD004224.
3. Guise J, McDonagh M, Osterweil P, Nygren P, Chan B, Helfand M. Systematic review of the incidence and consequences of uterine rupture in women with previous caesarean section. *BMJ* 2004; 329:19–25.
4. Vaginal Birth After Cesarean (VBAC). Summary. Evidence Report/Technology Assessment, No. 71. AHRQ publication 03-E017. Rockville, Md: Agency for Healthcare Research and Quality; 2003. Available at: www.ahrq.gov/clinic/epcsums/vbacsum.htm. Accessed on January 9, 2006.
5. McMahon MJ, Luther ER, Bowes WA, Olshan AF. Comparison of a trial of labor with an elective second cesarean section. *N Engl J Med* 1996; 335:689–695.

6. Dodd J, Crowther C. Vaginal birth after Caesarean versus elective repeat Caesarean for women with a single prior Caesarean birth: a systematic review of the literature. *Aust N Z J Obstet Gynaecol* 2004; 44:387–391.
7. Abitbol MM, Castillo I, Taylor UB, Rochelson BL, Shmoys S, Monheit AG. Vaginal birth after cesarean section: the patient's point of view. *Am Fam Physician* 1993; 47:129–134.
8. Landon M, Hauth J, Leveno K, et al, for the National Institute of Child Health and Human Development Maternal-Fetal Medicine Units Network. Maternal and perinatal outcomes associated with a trial of labor after prior cesarean delivery. *N Engl J Med* 2004; 351:2581–2589.
9. Wen S, Rusen I, Walker M, et al, for the Maternal Health Study Group, Canadian Perinatal Surveillance System. Comparison of maternal mortality and morbidity between trial of labor and elective cesarean section among women with previous cesarean delivery. *Am J Obstet Gynecol* 2004; 191:1263–1269.
10. Smith G, Pell J, Cameron A, Dobbie R. Risk of perinatal death associated with labor after previous cesarean delivery in uncomplicated term pregnancies. *JAMA* 2002; 287:2684–2690.
11. Hook B, Kiwi R, Amini S, Fanaroff A, Hack M. Neonatal morbidity after elective repeat cesarean section and trial of labor. *Pediatrics* 1997; 100:348–353.
12. American College of Obstetricians and Gynecologists Committee on Practice Bulletins—Obstetrics. ACOG Practice Bulletin. Vaginal Birth After Cesarean Delivery. *Obstet Gynecol* 2004; 104:203–212.
13. Martel M, MacKinnon C, and the Clinical Practice Obstetrics Committee, Society of Obstetricians and Gynaecologists of Canada. Guidelines for vaginal birth after previous Caesarean birth. *J Obstet Gynaecol Can* 2005; 27:164–188.

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THE JOURNAL OF FAMILY PRACTICE

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Strength of Recommendation (SOR) ratings are given for key recommendations for readers. SORs should be based on the highest-quality evidence available.

- **A** Recommendation based on consistent and good-quality patient–oriented evidence.
- **B** Recommendation based on inconsistent or limited-quality patient-oriented evidence.
- **C** Recommendation based on consensus, usual practice, opinion, disease-oriented evidence, or case series for studies of diagnosis, treatment, prevention, or screening

Levels of evidence determine whether a study measuring patient-oriented outcomes is of good or limited quality, and whether the results are consistent or inconsistent between studies.

STUDY QUALITY

1—Good-quality, patient-oriented evidence (eg, validated clinical decision rules, systematic reviews and meta-analyses of randomized controlled trials [RCTs] with consistent results, high-quality RCTs, or diagnostic cohort studies)

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