**CLINICAL MANAGEMENT GUIDELINES**

**OBSTETRICIAN—GYNECOLOGISTS**

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**Vaginal Birth After Previous Cesarean Delivery**

A trial of labor after previous cesarean delivery has been accepted as a way to lower the overall cesarean delivery rate. In 1995, 27.5% of women who had a previous cesarean delivery attempted vaginal birth; some clinicians believe that an even higher percentage is possible (1). Although there is a strong consensus that trial of labor is appropriate for most women who have had a previous low-transverse cesarean delivery, increased experience with vaginal birth after cesarean delivery (VBAC) indicates there are several potential problems. This document will review the current risks and benefits of VBAC in various situations and provide practical management guidelines.

Background

Beginning in the 1970s, the marked reduction in the maternal death rate focused obstetricians' attention on fetal morbidity and mortality. Physicians in the United States, facing increased medical-legal pressures, performed fewer vaginal breech deliveries and fewer midpelvic forceps deliveries. In addition, nonreassuring fetal status was diagnosed more frequently because of wide variations in the inter-pretation of continuous electronic fetal monitoring. Finally, dystocia, as an indication for cesarean delivery, was diagnosed more frequently. Consequently, the cesarean delivery rate in the United States increased from 5% to 20.8% between 1970 and 1995 (1) and reached 24.7% in 1988 (2, 3).

With few exceptions, major improvements in newborn outcome from the increased cesarean delivery rate are yet to be proven (4). It generally is agreed that the current rate is high. The overall number of cesarean deliveries can be reduced safely and effectively when the indications for primary cesarean birth are reviewed and audited (5-7). However, most efforts have focused on decreasing the number of elective repeat cesarean births because they account for one third of all cesarean deliveries.

Changing Concepts

The dictum "once a cesarean, always a cesarean" dominated obstetric practice in the United States for nearly 70 years (8). This concept began changing gradually about 30 years ago as improvements in obstetric care made trial of labor safer for both mother and infant. In 1981, when the VBAC rate was only 3%, the National Institutes of Health began to encourage trial of labor. The American College of Obstetricians and Gynecologists also was a leader in this effort (9), and a number of reports have documented the relative safety of trial of labor (10-14). Some third-party payers and managed care organizations have mandated that all women who had previous cesarean deliveries must undergo trial of labor. *Consequently, physicians may find themselves pressured to attempt trial of labor either in situations that they consider to be unsuitable or with patients who do not desire the procedure.*

Recent Issues

Despite more than 800 citations in the literature, there are no randomized trials to prove that maternal and neonatal outcomes are better with VBAC than with repeat cesarean delivery. Published evidence suggests that the benefits of VBAC outweigh the risks in most women with a prior low-transverse cesarean delivery. Nevertheless, most studies of VBAC have been conducted in university or tertiary-level centers with in-house staff coverage and anesthesia. The safety of trial of labor is less well documented in smaller community hospitals or facilities where resources may be more limited (15-18). It has become apparent that VBAC is associated with a small but significant risk of uterine rupture with poor outcome for both mother and infant (19-22). Reports indicate that maternal and infant complications also are associated with an unsuccessful trial of labor. Increasingly, these adverse events during trial of labor have led to malpractice suits (22-24). These developments, which have led to a more circumspect approach to trial of labor by even the most ardent supporters of VBAC, illustrate the need to reevaluate VBAC recommendations (23, 25).

**Clinical Considerations and Recommendations**

Who are candidates for a trial of labor?

Most patients who have had a low-transverse uterine incision from a previous cesarean delivery and who have no contraindications for vaginal birth are candidates for a trial of labor. Women who have had two previous low-transverse cesarean deliveries also may be considered for a trial of labor, but the risk of uterine rupture increases with the number of previous uterine incisions (13). Following are selection criteria useful in identifying candidates for VBAC:

One or two prior low-transverse cesarean deliveries

Clinically adequate pelvis

No other uterine scars or previous rupture

**Physician readily available throughout labor capable of**

**monitoring labor and performing an emergency cesarean delivery**

**Availability of anesthesia and personnel for emergency cesarean delivery**

There has been a tendency to expand the list of obstetric circumstances under which VBAC may be appropriate. These include multiple previous cesarean deliveries (26, 27), unknown uterine scar (13, 28), breech presentation (29, 30), twin gestation (31, 32), postterm pregnancy (33), and suspected macrosomia (34, 35). Whether trial of labor should be encouraged for patients with these obstetric circumstances and a low-vertical uterine incision is controversial (18, 36, 37). Although success has been reported in some series, continuing analysis of the risk of adverse outcome is necessary before VBAC is routinely adopted in these circumstances.

What is the success rate for trials of labor?

Most published series indicate that approximately 60-80% of trials of labor after a previous cesarean delivery result in successful vaginal births (14, 38, 39). However, these success rates often apply to a selected population. Patients thought to be inappropriate candidates for a trial of labor usually have been excluded, and the exact percentage of women undergoing trial of labor is not consistently stated.

Although a number of scoring systems have been used, there is no completely reliable way to predict whether a trial of labor will be successful in an individual patient (40-44). The success rates of VBAC in women whose first cesarean delivery was performed for a nonrecurring indication are similar to those of patients who have not undergone previous cesarean delivery (45). A woman who has undergone vaginal delivery at least once before or after her previous cesarean birth also is more likely to have a successful trial of labor than the woman who has not undergone vaginal delivery (45, 46).

Many patients with a previous diagnosis of dystocia successfully deliver vaginally, but the percentage is consistently lower (50-70%) than for those with nonrecurring indications (12, 14, 47, 48). The lower rate is most likely related to the accuracy of the original diagnosis of dystocia.

What are the risks and benefits associated with VBAC?

Neither repeat cesarean delivery nor trial of labor is risk free. When VBAC is successful, it is associated with less morbidity than repeat cesarean delivery. The advantages include fewer blood transfusions, fewer postpartum infections, and shorter hospital stays, usually with no increased perinatal morbidity (11, 12, 14).

It often is stated that the cost of VBAC is less than that of repeat cesarean delivery. However, for a true analysis of all the costs one has to include the costs to the hospital, the method of reimbursement (ie, per diem diagnosis-related group or capitation), and medical malpractice payments. Higher costs may be incurred by a hospital if a woman has a prolonged labor or has significant complications, or if the newborn is admitted to a neonatal intensive care unit. Furthermore, 20-40% of women will fail the trial of labor, which will incur surgical costs. Increased time or attendance for a woman undergoing a trial of labor results in increased cost to the physician. The difficulty in assessing the cost-benefit of VBAC is that the costs are not all incurred by one entity.

Those patients who fail a trial of labor are at increased risk for infection and morbidity (49-52). Infants born by repeat cesarean delivery after a failed trial of labor also have increased rates of infection (53). In contrast to previous reports, the most recent series showed that major maternal complications such as uterine rupture, hysterectomy, and operative injury were more likely for women who underwent a trial of labor than for those who elected repeat cesarean delivery (50).

Rupture of the uterine scar can be life-threatening for both mother and infant (19-22). When catastrophic uterine rupture occurs, some patients will require hysterectomy and some infants will die or will be neurologically impaired (22, 50). In most cases, the cause of uterine rupture in a patient who has undergone VBAC is unknown, but poor outcomes can result even in appropriate candidates.

The occurrence of uterine rupture is dependent on the type and location of the previous incision. Estimated occurrence based on the literature is as follows (18, 39):

Classical uterine scar (4-9%)

T-shaped incision (4-9%)

Low-vertical incision (1-7%)

Low-transverse incision (0.2-1.5%)

The most common sign of uterine rupture is a non-reassuring fetal heart rate pattern with variable decelerations that may evolve into late decelerations, bradycardia, and undetectable fetal heart rate. Other findings are more variable and include uterine or abdominal pain, loss of station of the presenting part, vaginal bleeding, and hypovolemia.

What are contraindications for VBAC?

A trial of labor is not recommended in patients at high risk for uterine rupture. Circumstances under which a trial of labor should not be attempted are as follows:

Prior classical or T-shaped incision or other transfundal uterine surgery (54)

Contracted pelvis (18)

Medical or obstetric complication that precludes vaginal delivery

Inability to perform immediate emergency cesarean delivery because of unavailable surgeon, anesthesia, sufficient staff, or facility

**A combination of factors, which singly may not be compelling for cesarean delivery in a patient without a uterine scar, may influence the decision to forego VBAC and recommend repeat cesarean delivery.**

How should patients be counseled?

The enthusiasm for VBAC varies greatly among patients and physicians. It is reasonable for women to undergo a trial of labor in a safe setting, but the potential complications should be discussed thoroughly and documented (55). If the type of previous incision is in doubt, attempts should be made to obtain medical records. After thorough counseling that weighs the individual benefits and risks of VBAC, the ultimate decision to attempt this procedure or undergo a repeat cesarean delivery should be made by the patient and her physician (see Fig. 1). Global mandates for a trial of labor after a previous cesarean delivery are inappropriate because individual risk factors are not considered. It should be recognized that there are repeat elective cesarean deliveries that are clinically indicated (56). The informed consent process and the plan of management should be documented in the prenatal record.

How does management of labor differ for patients undergoing VBAC?

Despite extensive data on VBAC, there is relatively little information on how labor should be conducted. Management of labor varies in different situations.

External Cephalic Version. Limited data suggest that external cephalic version for breech presentation may be as successful for VBAC candidates as for women who have not undergone previous cesarean delivery (57).

Analgesia. Vaginal birth after cesarean delivery is not a contraindication to epidural anesthesia, and adequate pain relief may encourage more women to choose a trial of labor (58, 59). Success rates for VBAC are similar in women who do and those who do not receive epidural analgesia, as well as in those women who receive other types of pain relief (60-62). Epidural analgesia rarely masks the signs and symptoms of uterine rupture.

Intrapartum Management. Once labor has begun, the patient should be evaluated promptly. Most authorities **recommend continuous electronic monitoring**. Personnel who are familiar with the potential complications of VBAC should be present to watch for nonreassuring fetal heart rate patterns and inadequate progress in labor.

Induction. Induction or augmentation with oxytocin has been suspected as a factor responsible for uterine rupture. A meta-analysis found no relationship between the use of oxytocin and rupture of the uterine scar (14). However, other studies indicate that high infusion rates of oxytocin place women at greater risk (63, 64). Although there are studies that suggest that prostaglandin gel applied to the cervix or vagina appears to be safe (65-67), there are occasional reports of uterine rupture with prostaglandin preparations (68, 69).

Delivery. There is nothing unique about delivery of the infant after a trial of labor. The need to explore the uterus after successful vaginal delivery is controversial. Most asymptomatic scar dehiscences heal well, and there are no data to suggest that future pregnancy outcome is better if the dehiscence is surgically repaired. Excessive vaginal bleeding or signs of hypovolemia at delivery require prompt and complete assessment of the previous scar and the entire genital tract.

How should future pregnancies be managed after uterine rupture?

If the site of the ruptured scar is confined to the lower segment, the rate of repeat rupture or dehiscence in labor is 6% (70). If the scar includes the upper segment of the uterus, the repeat rupture rate is 32% (70, 71). Therefore, **women who have had a prior uterine rupture should undergo repeat cesarean delivery as soon as the fetus is mature**.

Summary

The following recommendations are based on good and consistent

scientific evidence (Level A):

Most women with one previous cesarean delivery with a low-transverse incision are candidates for VBAC and should be counseled about VBAC and offered a trial of labor.

Epidural anesthesia may be used for VBAC.

A previous uterine incision extending into the fundus is a contraindication for VBAC.

The following recommendations are based on limited or inconsistent scientific evidence (Level B):

Women with two previous low-transverse cesarean deliveries and no contraindications who wish to attempt VBAC may be allowed a trial of labor. They should be advised that the risk of uterine rupture increases as the number of cesarean deliveries increases.

Use of oxytocin or prostaglandin gel for VBAC requires close patient monitoring.

Women with a vertical incision within the lower uterine segment that does not extend into the fundus are candidates for VBAC.

The following recommendations are based primarily on consensus and expert opinion

(Level C):

Because uterine rupture may be catastrophic, VBAC should be attempted in institutions equipped to respond to emergencies with physicians readily available to provide emergency care.

After thorough counseling that weighs the individual benefits and risks of VBAC, the ultimate decision to attempt this procedure or undergo a repeat cesarean delivery should be made by the patient and her physician.

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The MEDLINE database, the Cochrane Library, and ACOG's own internal resources and documents were used to conduct a literature search to locate relevant articles published between January 1985 and March 1998. The search was restricted to articles published in the English language. Priority was given to articles reporting results of original research, although review articles and commentaries also were consulted. Abstracts of research presented at symposiums and scientific conferences were not considered adequate for inclusion in this document. Guidelines published by organizations or institutions such as the National Institute