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# Vaginal Delivery after Cesarean Section

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Additional information is available at the end of the chapter

<http://dx.doi.org/10.5772/intechopen.75900>

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## Abstract

Cesarean delivery is needed (indicated) for many reasons such as failure to progress, cephalopelvic disproportion, antepartum hemorrhage, preeclampsia, and repeated cesareans. The increase of the cesarean delivery rate is accompanied with an increase in the maternal and perinatal morbidities and increase in maternal mortality such as complications of anesthesia, injury to the nearby structure, respiratory distress syndrome, childhood allergy and childhood obesity. Vaginal delivery after cesarean section (VBAC) is one of the tools that aimed to reduce the rate of cesarean delivery. Here in this chapter we would like to highlight the different guidelines for VBAC, the success rate of VBAC, the determinant of the success rate, maternal and perinatal outcomes of VBAC. Then the arena of using oxytocic drugs in VBAC is discussed in details too.

**Keywords:** cesarean section, trial of labour, uterine rupture, induced labour, oxytocin, prostaglandins, misoprostol

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## 1. Introduction

Childbirth is a special event in every woman's life and the occurrence marks the beginning of a new role of being a mother. In the past, individuals relied on the traditional vaginal birth method which sometimes ended up in fetal loss, maternal death or long term maternal morbidity in the form of perineal injuries and fistula formation. Fortunately, advancement in technology has revolutionized the healthcare industry and in particular, childbirth process [1]. Cesarean delivery refers to child delivery through abdominal cut [2].

## 2. Vaginal delivery after cesarean section

### 2.1. Indications for cesarean delivery

There are various maternal and fetal indications for cesarean delivery (**Table 1**) [3–6].

### 2.2. Complications of cesarean delivery

There are various complications of cesarean delivery (**Table 2**) [7–10].

Maternal indications	Fetal indications
Failed progress of labor	Presentation of the fetus
Cephalopelvic disproportion	Large size babies/fetal macrosomia
Antepartum hemorrhage	Higher order multiple pregnancies
Preeclampsia	Preterm births
Infection	Fetal distress
Repeated cesareans	Precious baby
Maternal request	

**Table 1.** Indications of cesarean delivery.

Maternal complications	Fetal complications
Complications of anesthesia	Preterm delivery
Hemorrhage	Respiratory distress syndrome
Injury to the nearby structure	Delayed initiation of breast feeding
Infections	Childhood allergy
Deep venous thrombosis	Childhood obesity
Abnormal placentation	
Infertility issues	

**Table 2.** Complications of cesarean delivery.

## 3. Vaginal birth after cesarean section

Trial of labor after cesarean delivery (TOLAC) refers to a planned attempt to deliver vaginally by a woman who has had a previous cesarean delivery, regardless of the outcome. This method provides women who desire a vaginal delivery the possibility of achieving the goal

“a vaginal birth after cesarean delivery (VBAC).” It is one of the tools to decrease or avoid the rising rate of cesarean delivery. In general, good candidates for planned TOLAC are those women in whom the balance of risks (as low as possible) and chances of success (as high as possible) are acceptable to the patient and obstetrician.

It is possible for women to have vaginal delivery even after a previous cesarean delivery. It has been shown 55–67% of women, who had previously delivered through cesarean delivery, had successful vaginal delivery afterward [11, 12].

Primarily, the success of vaginal childbirth is dependent on different factors. When the procedure is handled by unqualified individuals, it can result in complications which can reduce the rate of successful delivery.

High success rates have been attained when the amniotic fluid does not contain meconium. In addition, vaginal birth should not be prioritized when a patient, who had given birth previously through cesarean delivery, has prolonged labor [11, 12]. Importantly, the characteristics of the cervical regions are crucial in ascertaining if a woman can give birth without necessary undergoing another cesarean section operation [11, 12].

Notably, studies have established that women that have given birth through the vaginal childbirth process are likely to show high success rate when compared to others that were operated during the same process.

## 4. Factors affecting success rate of TOLAC

### 4.1. Antepartum factors

#### 4.1.1. Indication for prior cesarean delivery

The rate of successful TOLAC by indication for prior cesarean delivery was higher when the fetal malpresentation was the indication compared with non-reassuring fetal heart rate pattern, and failure to progress (**Table 3**) [11–15].

#### 4.1.2. Prior vaginal delivery

Vaginal delivery before or after the cesarean delivery is the good sign for successful TOLAC.

### 4.2. Demographic factors

Some ethnicity, e.g., Hispanic, African American, and Asian women are less likely to have a successful VBAC.

Increasing maternal age, women with less education and high body mass are also having a reduced likelihood of successful TOLAC.

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Indication for prior cesarean delivery
Prior vaginal delivery
Demographic factors
Maternal medical disease
Intrapartum factors
Fetal macrosomia
Type of hospital

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**Table 3.** Factors affecting success rate of TOLAC [11–15].

*4.2.1. Maternal medical disease*

Maternal medical disease such as hypertension, diabetes, asthma, renal disease, and heart disease have been reported to reduce the likelihood of successful TOLAC.

**4.3. Intrapartum factors**

*4.3.1. Admission labor status*

Women in spontaneous labor or with a high bishop score are more likely to have successful TOLAC than women who are being induced or who have low Bishop scores.

*4.3.2. Fetal macrosomia*

A fetus weighing more than 4000 g reduces the likelihood of successful TOLAC.

*4.3.3. Type of hospital*

University hospitals or those affiliated with obstetrics and gynecology residency program have higher rates of TOLAC and successful VBAC. Women who deliver at a private or rural hospital have a decreased likelihood that TOLAC will be attempted, and if attempted, a decreased rate of successful VBAC when compared to a tertiary care or perinatal center.

**5. Potential benefits and risk of VBAC**

**5.1. Potential benefits of VBAC**

In addition to fulfilling a patient’s preference for vaginal delivery, at an individual level, VBAC is associated with decreased maternal morbidity and the expected complications in future pregnancies as well as a decrease in the overall cesarean delivery rate at the population level.

Maternal complications	Perinatal complications
Failure of the trial	Mortality
Uterine rupture	Hypoxic ischemic encephalopathy
Hemorrhage and transfusion	Respiratory problems
Peripartum hysterectomy	Others
Infection	
Pelvic floor injury	

**Table 4.** Maternal and perinatal complication of VBAC and ERCS.

Compared to CS, women having a VBAC have [15–17].

Fulfilling a patient's preference for vaginal delivery.

Shorter stays in hospital and recovery period.

Avoid major abdominal surgery.

Lower rates of hemorrhage, infection, deep vein thrombosis.

Enhanced mother-infant bonding, including the long term wellbeing of the infant.

Lower maternal morbidity.

## 5.2. Potential risks of VBAC and TOLAC

VBAC is associated with fewer complications than elective repeat cesarean delivery, whereas a failed TOLAC is associated with more complications (**Table 4**) [15–17].

## 6. Induction of labor after cesarean section pros and cons

Induction of labor is possible even after delivering a first child through the cesarean. However, the chances of a successful birth are dependent on whether a woman delivered through the vaginal process in an earlier pregnancy. Ideally, there are both pros and cons of labor induction after cesarean section.

### 6.1. Pros

One of the key advantages of induction of labor after cesarean section is that it allows a woman to give birth through the vaginal process. Induction is recommended, by professionals, once a woman reaches the 41 weeks of gestation. Induction reduces the likelihood of having meconium in the amniotic fluid. Significantly, precaution has to be taken given that labor induction, for instance, when dealing with women with past cesarean section experiences can be risky [18].

## 6.2. Cons

Labor induction, among women that have delivered through the cesarean section, have been found to be risky and it can result in the rupture of the uterine walls [18]. Basically, this is because the process put pressure on the lower abdomen which could be having scars. Fortunately, the uterine rupture is not a major issue given that it occurs among four to five women in every 1000 operations [19]. However, the issue has to be addressed adequately to avoid further complications.

Besides this, complications can be registered when dealing with mothers that are diabetic. It is estimated that diabetes is the major cause of obstacles in 2–3% of all pregnancies [30]. The mentioned disease can derail the healing of scars in the uterine area. As a result, induction of labor and vaginal delivery in this group, even after a first successful cesarean section, can be risky and the effectiveness rates are lower when compared with other women without the similar condition [20].

Furthermore, considerations have to be made when dealing with obese mothers. Research indicates that obese mothers have a low rate of 13% of having children through the vaginal process after undergoing cesarean section in previous pregnancies [19]. The infection morbidity rate is considered to be high in obese women when judged against non-obese. In short, there are numerous disadvantages when an obese woman decides to give birth through the vaginal process after a past successful cesarean section.

In the end, the cesarean section has been a major boost in reducing child and mother mortality after birth. The process has been refined since its earlier inception ancient times. At present, it is a safe method of childbirth, especially, when a mother has health-related complications. Notably, parameters have to be observed when dealing with special groups, for instance, obese and diabetic pregnant women. Indeed, there are various indications and contradictions of cesarean section. Despite this, the process is fast and it has various advantages.

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