

Vaginal Birth after Cesarean Section

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Abstract

Background: The rate of primary cesarean section (CS) is on the rise. More and more women report with a history of a previous CS. A trial of vaginal delivery can save these women from the risk of repeat CS. **Aims:** The study was conducted to assess the safety and success rate of vaginal birth after CS (VBAC) in selected cases of one previous lower segment CS (LSCS). **Materials and Methods:** The prospective observational study was carried out in a tertiary care teaching hospital over a period of two years. One hundred pregnant women with a history of one previous LSCS were enrolled in the study. **Results:** In the present study, 85% cases had a successful VBAC and 15% underwent a repeat emergency LSCS for failed trial of vaginal delivery. Cervical dilatation of more than 3 cm at the time of admission was a significant factor in favor of a successful VBAC. Birth weight of more than 3,000 g was associated with a lower success rate of VBAC. The incidence of scar dehiscence was 2% in the present study. There was no maternal or neonatal mortality. **Conclusion:** Trial of VBAC in selected cases has great importance in the present era of the rising rate of primary CS especially in rural areas.

Keywords: Lower segment cesarean section, Rural India, Scar dehiscence, Trial of labor, Vaginal birth after cesarean section

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Introduction

Vaginal birth after cesarean section (VBAC) is one of the strategies developed to control the rising rate of cesarean sections (CSs). It is a trial of vaginal delivery in selected cases of a previous CS in a well-equipped hospital.^[1] In 1916, Cragin popularized the dictum, "once a caesarean section, always a caesarean section".^[2] That was the era of the classical CS. In the present era of lower segment caesarean section (LSCS), cesarean-related morbidity and mortality are significantly reduced. The dictum now is "once a caesarean section, always an institutional delivery in a well-equipped hospital". The reasons which led to the reversal of the old dictum are based upon the newer concepts of the assessment of scar integrity, fetal well-being, and improved facilities of emergency CS.^[3]

Nevertheless, a previous CS does cast a shadow over the outcome of future pregnancies.^[4] With present techniques and skill, the incidence of cesarean scar rupture in subsequent pregnancies is very low. The strength of the uterine scar and its capacity to withstand the stress of subsequent pregnancy and labor cannot be completely assessed or guaranteed in advance. These cases require the assessment and supervision of a senior obstetrician during labor.^[5] Hence, the present study was undertaken to assess the success and safety of VBAC in selected cases of one previous LSCS and to evaluate the maternal and fetal outcome in these cases.

Materials and Methods

This prospective observational study was carried out at a tertiary care teaching hospital located in a rural area of central India from January 2010 to December 2011. This hospital gets referrals of high-risk cases from neighbouring villages and townships. About 6,000 deliveries take place annually in the hospital with the rate of CS ranging between 22 and 24%. A total of 100 cases of a previous CS were selected either from the outpatient department (booked) or in labor (unbooked). Booked cases were regularly followed up in the antenatal clinic and the unbooked patients, who reported directly for

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labor, were then assessed for a trial of vaginal delivery. A study protocol was submitted to the institutional ethical committee of the Pravara Institute of Medical Sciences, and approval was sought before start of the study.

Cases with a single previous transverse lower uterine segment scar with adequate size of pelvis were included in the study after informed consent. Cases with previous classical or inverted T-shaped incision on the uterus, previous two or more LSCSs, with other uterine scars, history of previous rupture of the uterus or scar dehiscence, contracted pelvis or cephalopelvic disproportion, and those having other medical or obstetrical complications associated with pregnancy were excluded from the study. A total of 100 cases that fulfilled the selection criteria were enrolled in the study. All cases and their close relatives were explained about the advantages of vaginal birth over elective CS. They were also explained about the risk of scar dehiscence and the need for emergency CS, if trial of vaginal delivery failed. Written informed consent was obtained at the time of enrolment in the study. The patients were asked to come for regular antenatal checkups and were advised to plan their delivery in the hospital where the study was conducted. Hematological and serological investigations and obstetric sonography were performed during antenatal visits. The women were advised to get admitted in the ward, one week prior to their expected date of delivery. After going through the record related to her previous CS, a decision regarding VBAC was taken by a senior obstetrician in the later weeks of pregnancy or during labor. The cases selected for VBAC were monitored carefully during labor by continuous electronic fetal monitoring. All the cases were provisionally prepared for emergency CS. Intrapartum monitoring was done by using the standard partograph of the World Health Organization (WHO). Four-hourly internal examinations were performed to assess the progress, and special attention was paid toward the evidence of scar dehiscence or rupture. The trial of vaginal delivery was continued till there was satisfactory progress. The trial was terminated by emergency repeat CS, when there was evidence of unsatisfactory progress, scar tenderness, or fetal distress. Cases with successful VBAC delivery were kept in the hospital for five days and those who required repeat CS were kept for seven days after the operation. All cases received broad-spectrum antibiotics (injection ampicillin 500 mg intravenously and injection metronidazole 500 mg intravenously six-hourly) for either five or seven days.

Statistical analysis

Relevant information on maternal and fetal parameters including outcome of the present pregnancy (age, parity,

registration status, interval between present pregnancy and previous CS, place, indication, and outcome of previous CS, mode of delivery in the present pregnancy, and maternal and perinatal outcome) in individual cases was collected in a structured pro-forma, entered in Microsoft Office Excel format, and statistical analysis was performed using SPSS software (version 16.0). All values were expressed in the form of proportion and percentages.

Results

It was observed that eighty percent women had registered themselves for antenatal care, 30% women were carrying their second pregnancy, 45% their third pregnancy, and another 25% their fourth pregnancy. The interval between a previous CS and the present pregnancy was more than two years in 77% of the cases. Eighty-five percent cases of previous CSs delivered vaginally, whereas 15% required a repeat CS [Table 1].

It was seen that the women with cervical dilatation of more than 3 cm at the time of admission in the hospital had a better chance (90%) of vaginal delivery than women with a dilatation of less than 3 cm (60%). The success rate of vaginal birth after a previous CS done for nonrecurrent indications like fetal distress, malpresentations, pre-eclampsia, premature rupture of membranes, and postdated pregnancy was in the range of 80 to 90%, whereas the success rate of vaginal birth after previous CS done for indications like nonprogress of labor or borderline cephalopelvic disproportion was in the range of 60 to 70% [Table 2].

The average duration of labor was less than 10 hours in 94% cases, who delivered vaginally as compared to 80% cases requiring a repeat CS. The indications of a repeat CS were fetal distress (46%), scar dehiscence (13%), undiagnosed cephalopelvic disproportion (13%), and labor abnormalities like protracted active phase, cervical dystocia, and malrotation of head [Table 3]. It was further observed that women with a previous vaginal delivery had a better chance (90%) of a successful VBAC as compared to women who did not have a previous vaginal delivery (77%). A birth weight of more than 3,000 gm was associated with a lower success rate of VBAC. In the present study, there were two cases of

Table 1: Mode of delivery following trial of vaginal birth after cesarean section

Mode of delivery	No. of cases (n=100)
Spontaneous vaginal delivery	83
Repeat lower segment cesarean section	15
Vaginal instrumental delivery	02

Data indicates both number and percentage

Table 2: Indication of previous caesarean section and outcome of trial of VBAC in present pregnancy

Indication of previous caesarean section	No. of cases (n=100)	Successful VBAC (n=85) (%)	Emergency LSCS (n=15) (%)
Fetal distress	30	25 (83.33)	05 (16.67)
Cephalopelvic disproportion	20	17 (85)	03 (15)
Malpresentations			
Breech	10	08 (80)	02 (20)
Transverse lie	05	05 (100)	00 (0)
Pre-eclampsia	08	07 (87.5)	01 (12.5)
Nonprogress of labor	06	04 (66.66)	02 (33.34)
Oligohydramnios	05	04 (80)	01 (20)
Prolonged PROM	05	04 (80)	01 (20)
Multiple gestation	03	03 (100)	-
Postdatism	03	03 (100)	-
Cervical dystocia	02	02 (100)	-
Failure of induction	01	01 (100)	-
Unfavorable cervix	01	01 (100)	-
Cord prolapse	01	01 (100)	-

VBAC: Vaginal birth after caesarean section; PROM: Premature rupture of membranes; LSCS: Lower segment cesarean section

Table 3: Indication of repeat emergency LSCS in cases of failed trial of VBAC

Indication of repeat emergency LSCS	Number of cases (n=15)	Percentage
Fetal distress	07	46.66
Scar dehiscence	02	13.34
Undiagnosed CPD	02	13.34
Protracted active phase	01	6.66
Deep transverse arrest	01	6.66
Occipito posterior	01	6.66
Cervical dystocia	01	6.66

LSCS: Lower segment cesarean section; CPD: Cephalopelvic disproportion; VBAC: Vaginal birth after caesarean section

scar dehiscence, one case of broad ligament hematoma, and one case of cervico-vaginal laceration. Two cases required blood transfusion. Four babies had birth asphyxia. There was no stillbirth or neonatal death. The average duration of hospital stay for women having a successful VBAC was lower (4.59 days) than women who required a repeat CS (8.40 days).

Discussion

With the significant rise in the incidence of primary CS for various indications, an increasing proportion of the pregnant women coming for antenatal care report with a history of a previous CS. These women belong to a high-risk group due to the risk of a scar rupture. The obstetrician is always in a dilemma regarding the mode of delivery in these cases. Assessment of

the individual case with regard to the possibility of a successful VBAC is necessary while taking the decision. The unending dilemma of an obstetrician is about the management of subsequent labor, once the patient has a scar on the uterus. Some suggest an elective CS for such cases, whereas others choose a trial of labor. Many take a middle route, that is, individualization of case. By far, the greatest problem for the attendant in subsequent labor is the integrity of the uterine scar.^[6] Uterine rupture has the potential for causing serious harm to the pregnant woman as well as the baby. This is the most important risk to be noted, but the advantage which the vaginal delivery imparts largely outweighs the risks associated with a repeat CS. The maximum percentage of cases in the present study were in the age group of 21 to 30 years as compared to other age groups, reflecting the child-bearing age of most of the women. The interval between the previous cesarean and the present pregnancy was more than two years in 77% cases, whereas it was less than two years in 23% of the cases. Shipp *et al.*^[6] studied the risk of scar dehiscence in relation to the interval between a previous CS and the present pregnancy. He reported that the rate of scar rupture was 2.3%, when the interval was less than 18 months as compared to 1%, when the interval was more than 18 months. Similarly, in the present study, the rate of scar rupture was 2% and the interval was less than two years. In the present study, the commonest indication for a previous CS was fetal distress. The success rate of VBAC in these cases was 83%. Similar results (68 to 83%) have been reported by other workers.^[7-9] The success rate of VBAC in cases with a previous CS for cephalopelvic disproportion was 85% in the present study, which was much higher than reported by other workers (25 to 77%).^[7,10-12] It could be because of the over diagnosis of cephalopelvic disproportion in previous pregnancies. In this study, the success of VBAC in cases with a previous CS done for breech presentation was 80%. Studies by Jansen *et al.*^[10] and Phelan *et al.*^[7] have reported similar results. The success of VBAC in the present study was 85%. This result was comparable with the results of other studies reported by Riva and Teich,^[13] Dayal V,^[14] Allahabadia,^[15] Phelan *et al.*,^[7] and O Sullivan.^[16] In our study, the rate of a repeat CS was 15% and commonest indication was fetal distress. Phelan *et al.*^[7] and Dayal V.^[14] reported a lower (15%) rate of fetal distress requiring CS.

The success rate of VBAC in cases augmented with oxytocin was 83%. Dayal V.^[14] reported that the success rate of VBAC in cases induced with oxytocin depend on the Bishop's score. Flamm *et al.*^[17] reported that the use of oxytocin for induction or augmentation is safe in cases of previous CSs, when the infusion of oxytocin is well monitored. Lao *et al.*^[18] studied the safety of induction of labor in women scheduled for trial of labor.

They concluded that higher rates of infusion of oxytocin increase the rate of scar rupture, and that the use of a standard rate of infusion is useful in increasing the success rate of VBAC. In the present study, there were two cases of scar rupture. Both cases had a spontaneous onset of labor and oxytocin was not used in them.

The success rate of VBAC was significantly higher (93 as against 7%) in cases with cervical dilatation of more than 3 cm as against less than 3cm at the time of admission. Landon *et al.*,^[19] Demianczuk *et al.*,^[20] and Pickhardt *et al.*^[21] reported similar findings in their studies. In the present study, the rate of successful VBAC in cases with previous normal vaginal delivery was 91%. Landon *et al.*,^[19] Kraiem *et al.*,^[22] Whiteside DC *et al.*,^[23] Bedoya, *et al.*^[24] and Phelan *et al.*^[7] reported that a previous vaginal delivery was the greatest predictor for a successful VBAC. There were two cases of scar dehiscence and one case each of cervicovaginal laceration and broad ligament hematoma. Cases with scar dehiscence were managed by CSs. Obara *et al.*^[25] reported two cases of ruptured uterus (0.93%) in their study of 214 cases of a previous CSs. Phelan *et al.*^[7] reported scar dehiscence in 1.9% cases and uterine rupture in 0.3% cases. Dayal V^[14] reported a higher rate (4.2%) of scar rupture. Palerme GR and Freidman EA *et al.*^[26] reported that the incidence of uterine rupture was 2.2% with classical CS, 1.3% with lower segment cesarean and 0.07% with lower segment transverse scar.

The American college of Obstetricians and Gynecologists (ACOG)^[27] estimated the risk of uterine rupture in women with a previous CS and concluded that the lower segment caesarean scar has a minimum risk (0.2–1.5%) of rupture during vaginal delivery. There was no maternal mortality in the present study. Neonatal morbidity in the form of a low Apgar score (<6) was observed in 4% babies. One of these four babies was born by ventouse extraction for prolonged second stage of labor, due to maternal exhaustion and poor maternal bearing down. The remaining three babies were born by emergency CS, following failed trial of vaginal delivery. One CS was performed for scar dehiscence and the other two were performed for fetal distress. Two babies had a tight loop of cord around the neck. All three caesarean babies had developed meconium aspiration, which resulted in birth asphyxia. There was no associated co-morbidity in these babies. All the four babies born with low Apgar score were kept in the neonatal intensive care unit. They received prophylactic antibiotics and breast feeding and were discharged from hospital with their mothers. Morbidity was three times more in cases which required a repeat CS than those with a successful VBAC delivery. Similar observations were reported in other studies.^[14,25] There was no perinatal mortality in the present study. Phelan *et al.*,^[7] in his study of 1,796 cases,

reported a perinatal mortality of 4.5/1,000 deliveries. It was observed that the success rate of VBAC depends on the birth weight of the baby. The success rate of VBAC decreased (18.7%) significantly when the birth weight was more than 3000 gm. Similar observations were made by other workers.^[19,23,28-30] The average duration of hospital stay for VBAC was 4.59 days, whereas it was six days for instrumental deliveries, and 8.4 days for cases requiring repeat CS. Benson *et al.*^[31] carried out a survey of the benefits of a successful VBAC and found out that a shorter hospital stay in a VBAC delivery has a positive impact on the psychology of the woman and decreases the total cost of hospitalization. Similar observations were made by other workers.^[32,33]

In spite of the ongoing efforts by the government to promote the norm of the small family, there is a perennial desire for more number of children, especially male children among the rural uneducated population. Many women do not accept sterilization even during the second CS. This decision exposes them to the development of complications related to scar rupture in subsequent pregnancy and labor. If women are explained about the option of VBAC and told about the risk associated with a repeat CS, many CSs can be avoided. VBAC should be encouraged in selected cases to reduce the risk of a repeated CS.^[34] Many obstetricians running private nursing homes do not conduct VBAC deliveries, with the fear of scar rupture and subsequent medico-legal litigations. They ignore the possible increase in the risk of scar rupture with two previous CSs, the incidence of which has risen over the last few decades. They also need to be educated about the long-term implications of preferring repeat CSs over VBAC deliveries. For the aforementioned reasons, conducting VBAC deliveries has a special significance among the rural uneducated population.

Limitations

The limitation of the study lies in the fact that the study was carried out in a tertiary care centre, where there is adequate manpower to supervise each delivery, reducing complication rates of VBAC. Similar results may not be replicated at centres other than tertiary care centres.

Conclusion

Majority of the cases of previous CS done for nonrecurrent indication can be delivered safely by the vaginal route, without any major complication to the mother and the newborn, in an institution having facilities for emergency CSs. It has been proved to be a safe alternative to repeat an elective CS.

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