



Vaginal Birth After Caesarean Section - Experience in Shree Birendra Hospital

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Abstract

Background: The rate of primary caesarean section (CS) is on the rising trend. Vaginal birth after CS (VBAC) can be an alternative to reduce this rate of CS worldwide. Antenatal examination and intrapartum monitoring are the most important factors for VBAC.

Aims: The aim of this study is to determine the prevalence of VBAC at SBH in selected cases. To analyze the maternal and fetal outcome of VBAC and repeat CS cases.

Methodology: It is a cross-sectional institute-based study carried out in Shree Birendra hospital, a tertiary level Nepalese Army Hospital, from March 2019 to March 2020. The study population included cases with one previous caesarean section fulfilling the inclusion criteria of Royal College of Obstetrician and Gynaecology (RCOG) for VBAC. After counseling for VBAC, the data were estimated of those who were willing for VBAC and those who refused. Trial of labor was given to the patients accepted for VBAC. Feto-maternal outcome were analyzed of VBAC and of repeat CS.

Results: There were total of 108 cases of previous LSCS reported at ANC OPD, among them 23 cases were excluded from the study as they were not meeting the RCOG inclusion criteria, 85 cases were enrolled in the study. Out of 85 cases, 75 (88.23%) refused to undergo VBAC, only 10 cases (11.76%) accepted to undergo trial of labor. Out of 10 cases, 5 (50%) had successful VBAC. The sample size was too small to come to any conclusion, still it is observed that women who had an emergency cesarean section in their first delivery had lower VBAC success particularly those with failed induction. No maternal and neonatal mortality observed.

Conclusion: Vaginal Birth after Caesarean section is relatively safe, provided it is conducted in carefully selected cases and under constant supervision. Spontaneous onset of labor, good Bishop score and average sized baby were good predictors of successful VBAC.

Keywords: VBAC; Antenatal; Intrapartum; Bishop Score; SBH; ANC

Introduction

VBAC is an alternative to repeated CSs. It peaked during the mid-1990s along with a lower total CS rate. A dramatic drop of the percentage of VBAC since that point of time accompanied with a steady rise of CS rates was explored. However, the evidence is inconsistent and the effect on VBAC is unclear. This decline has been a response to new evidence on the risks associated with VBAC and clinicians fear of professional liability [26,27]. In 1916, Cragin popularized the dictum "once a caesarean section, always a caesarean

section". That was the era of classical CS [1,2,17]. 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 on the scar integrity, fetal well-being, and improved facilities of emergency CS [2,17].

The unending dilemma of an obstetrician is about the management of subsequent labor, once the patient has a scarred uterus. Some suggest an elective Caesarean section, whereas others choose trial of labor. Many take a middle route, that is, individualization of

the case. A 60 to 80% success rate of vaginal birth after caesarean section has been reported by many authors if the primary caesarean section was done for non-recurring indications [7,18].

The data on the success and failure of the VBAC in Nepal is inadequate. There are limited number of studies available addressing the risk and benefits of VBAC. Moreover, the evidence is contradictory, the dilemma of the caregiver and the patients remain unanswered. So, we decided to conduct a prospective study for one year at SBH Maternity Unit, where we evaluated the number of cases of primary CS reported in the antenatal clinic, analyzed recurrent or non-recurrent causes of previous CS and prevalence of VBAC in our institution. We tried to analyze the maternal and fetal outcome of VBAC and repeat CS, as well as the success rate of VBAC in our tertiary care hospital of Nepalese Army.

Methodology

It is a cross-sectional observational prospective study carried out at Shree Birendra Hospital from March 2019 to March 2020 with the approval from IRC. All women coming with previous history of lower segment Caesarean section to the antenatal OPD, meeting the criteria of RCOG for VBAC were included in the study. We identified potential candidates for VBAC by a process of elimination.

Exclusion criteria

- History of more than one cesarean section
- Cephalopelvic disproportion
- Associated with obstetric complications
- Severe Preeclampsia, eclampsia and antepartum haemorrhage
- Multiple pregnancy
- Malpresentation, Malposition
- Short spacing less than 18 months
- Medical disorder
 - Moderate or Severe anaemia
 - Severe Hypertension
 - Diabetes mellitus
 - Renal disease
 - Heart disease.

Demographic data like age, occupation, educational status and current pregnancy details including gravida, gestational age, history of previous pregnancies, cause of previous CS, intraoperative and postoperative details from the documents if they possess or if they could recall, were obtained through an interview and recorded on predesigned and pretested proforma.

Detailed physical and obstetric examination along with fundal height, lie, presentation, position, scar tenderness and fetal heart rate was recorded. After evaluation, patients were thoroughly counseled regarding the potential benefits and risks of undergoing trial of labor and given her the choice to choose the mode of delivery. Informed verbal consent was obtained from all the patients agreed for VBAC.

The patients included were monitored according to the guidelines in the study design. Non progressing labor was identified as per the definition of Freidman for labor complication. A trial of labor was given, and progress was partographically monitored. Evaluation of fetal head descent by abdominal examination, cervical dilatation and effacement, progressive increase in frequency, duration and intensity of uterine contraction noted. Patients in spontaneous labor were also closely monitored for vital signs, fetal cardiac activity, lower abdominal tenderness, fetal distress, vaginal bleeding and urine retention. Signs and symptoms of scar dehiscence or rupture was monitored judiciously. Depending upon the clinical evaluation decision regarding the use of oxytocin and amniotomy was taken. If the progress of labor was satisfactory, trial of labor continued and allowed to deliver vaginally with an episiotomy or vacuum if needed. Facilities for emergency C-section were made available and postnatal patients with normal delivery was observed for 48 hours for vital signs, PPH or any other complications. Any sign of danger to mother or fetus during labor led to emergency C-section.

The success of VBAC was determined by the percentage of vaginal delivery. Data was analyzed using variables like maternal age, socio-economic status, educational status, type of onset of labor, perinatal outcome, maternal complications, indication of previous LSCS. Neonatal outcome was analyzed in relation to baby weight and APGAR score and NICU admission in context of VBAC as well as in repeat CS.

Statistical analysis

The categorial data was expressed in terms of frequencies and percentages while continuous data was expressed as mean.

Results

There were 1231 deliveries conducted at SBH in the maternity ward during the study period from March 2019 to March 2020. Among total deliveries 466 (38.8%) underwent Lower Segment Caesarean section. Out of 466 caesarean section 108 (23.1%) cases were of previous LSCS for various reasons. Above figure reflects the burden of previous LSCS in our institute.

Out of 108 total previous CS cases, 23 were excluded from the study and 85 (78.7%) women in the study group were defined as a potential candidate and were enrolled for a VBAC. 23 excluded cases included 4 previous 2 LSCS, 5 cases of previous LSCS with short spacing 18 months and below, 1 case of previous LSCS with PROM with Big Fibroid, 3 cases of previous LSCS with big baby > 3.5 kg, Previous LSCS in labor with scar tenderness 4 cases, 5 cases of Previous LSCS with high risk pregnancy and 1 case with multiple pregnancy. Out of 85 cases only 10 (11.76%) cases had attempted for VBAC and 75 (88.23%) cases had dropped out refused and demanded for repeat C-section. Among 85 cases, except 8 unbooked cases, rest were booked cases of our hospital. Among VBAC accepted cohort, except 1, all were booked cases. Booked cases were assessed regularly in antenatal clinic, and the unbooked cases, who reported directly for labor, were then assessed counseled for VBAC.

Demographic profile

Parity as defined using the obstetric history given by the patient. Recent research suggests that over 48% of women in this population had second child after 3 years to 5 years of first pregnancy and over 38% had their second child beyond 5 years to 11years of previous pregnancy. More than half the study population (58.8%) were second gravida.

In the present study, the commonest age group of study population was between 21 to 29 years which constituted of 37 (43.5%) cases, 31 women (36.4%) were between 30 -34 years of age. There were 7 cases (8.2%) above 35 years of age which falls into elderly group.

Among cohort who had accepted VBAC were between age group 24 to 37 years

Age in years	No.	Success of VBAC	Rate (%)	Failed VBAC	Rate (%)
20 - 24 years	1	1	100%	0	100%
25 - 30 years	5	3	60%	2	40%
31 - 34 years	2	1	50%	1	50%
35 - 37 years	2	0	0	2	100%

No association was found with literacy rate. Out of 85 cases 62 had attained education upto 10 - 12 standard. 15 had studied till Bachelor level. 8 had attained Master's degree. The study population who had accepted VBAC were 2 patients having bachelor's degree, 3 had education till 10th standard and 5 patients had completed intermediate studies. So, we could see there is no correlation with the education level in relation to accepting VBAC in this population of study.

Indications of previous LSCS and outcome of labor in present pregnancy among accepted VBAC group

Indication of Previous CS	No. of cases	Success of VBAC	Failed VBAC	Success Rate (%)
PROM with oligo	1	0	1	0
Fetal distress	5	4	1	80%
Crossed EDD	1	0	1	0
CPD	1	1	0	100%
Failed Induction	1	0	1	0
Transverse lie	1	0	1	0

On assessment of previous caesarean section in the previous pregnancy and outcome of the present labour, it was observed that all the patients who underwent caesarean section due to fetal distress in the previous pregnancy has a highest success rate than other non-recurrent causes. Among 5 cases, 4 delivered vaginally and only 1 required emergency LSCS for NPOL. It is observed that elderly patients have failed VBAC even though there was no recurrent cause of previous caesarean section.

Indications of previous caesarean section in patients who underwent elective repeat CS

Indications of previous CS	No. of patients	Percentage
Fetal distress	17	22.66%
CPD	3	4%
Breech, Transverse	5	6.66%
NPOL	9	12%
Failed Induction	11	14.66%
APH	2	2.6%
DTA	5	6.66%
PROM >24hrs not in labour	5	6.66%
Severe PIH with IUGR	7	9.33%
Primigravida with multiple pregnancy	2	2.6%
Oligohydramnios	4	5.33%
Big Baby	5	6.66%

The commonest cause of previous caesarean section is fetal distress followed by failed induction.

Indications of caesarean section in failed VBAC n = 5 among 10 accepted cases for VBAC

Patient Characteristics	No. of patients	Rate (%)	Outcome
Failed Induction	2	20%	Emergency LSCS
Crossed EDD	1	10%	Elective LSCS
Scar Tenderness	2	20%	Emergency LSCS

1 patient had repeat CS for failed induction, and the indication of previous CS was also failed induction. 1 patient had accepted VBAC, but later did not go into labor, so, CS done at 41 weeks. 2 patients having scar tenderness were found to have thinned out LUS, intraoperatively.

There were not any complications encountered in successful VBAC group. We observed one case of wound infection in failed VBAC who underwent emergency Caesarean section for failed in-

Neonatal outcome

Patient Characteristics	Success VBAC	Rate (%)	Failed VBAC	Rate (%)	Repeat CS	Rate (%)
Neonatal Weight in grams	Mean 3100		Mean 2950		Mean 3225	
Apgar score ≤ 6 in 1 min	2	40%	4	80%	27	36%
Apgar score > 6 in 1 min	3	60%	1	10%	48	64%
NICU admission	2	20%	0		12	16%

While analyzing the neonatal outcome, 2 babies from successful VBAC cohort were admitted in NICU for low APGAR score of 4 and 5 in 1 minute for observation and supportive care. After 48 hrs. of observation they were discharged. Low APGAR score in accepted VBAC cohort may be the consequences of second stage of labor.

In repeat CS cases there were 12 admissions in NICU, 3 for meconium aspiration, 6 for low APGAR score 4/10 -5/10 in 1 min and 8/10 in 5 minutes, 1 for low birth weight 2.1 kg, 2 for birth asphyxia. All of them were discharged after treatment. There was no neonatal mortality.

Discussion

Caesarean section is one of the most performed major surgical procedure [3]. Worldwide increase in caesarean section rate

duction with oxytocin. Whereas there were 17 cases that constituted 22.6% of total repeat caesarean section. Culture and sensitivity were sent, and 3 cases were found to have Klebsiella and Pseudomonas infection. Most Common commensals were Staphylococcus aureus, and few were found to have proteus species, too. All were treated with antibiotics after culture sensitivity.

There were 3 cases of postpartum hemorrhage making 4% of total repeat C-section which was managed with uterotonic drugs and blood transfusion. Puerperal pyrexia was 8% of total cases, investigated and mostly had urinary tract infection and chest infection.

2 cases of scar tenderness who underwent emergency caesarean section were found to have scar dehiscence of around 4 - 7 cm. In elective C-section, 9 cases that is 12% of total repeat C-section had scar dehiscence of 4-5 cm.

Fortunately, in our institution there were no cases encountered with uterine rupture, ureteric, bladder or gut injuries intraoperatively during the study period.

during the last three decades has been the cause for concern. Even though the variation exists in the rates of caesarean delivery across countries; currently the rate ranges from 10% to 40% [7,22,33]. Even in our institution the CS rate in 2069 was 22.5% with time now at present it has increased to 38%. The reasons for women adopting caesarean delivery include medical considerations such as, the complications during pregnancy or labor and delivery processes, and non-medical causes such as fear of pain, late marriages, on patients demand or more predictable delivery date and time. In Chinese and Asian culture, it is particularly common to have babies delivered at certain " auspicious " points in time. Many Chinese believe that the positive destiny of a person is crucially determined by the time and date of that person's birth [3]. On analyzing, these are some of the factors which are the causes of increasing CS rate in our institution especially, on demand CS.

Although attempts at trial of labor after caesarean section have become accepted practice, rate of attempted and successful VBAC has decreased during past 10 years in developed world. The number of patients attempting VBAC has drifted down in developing world from 20% to 10% during 2002 - 2005 [8,28]. In the USA, the overall rate of VBAC (i.e. successful VBAC/all women with a previous caesarean section) decreased from 24% in 1996 to 8% in 2010 [8]. A qualitative study from USA suggest that fear of litigation is a further reason why providers are highly selective in choosing candidates for VBAC [11,12]. Similar to these studies, even in our study the VBAC rate is found to be 11.7%, which is quite low and the one of the reasons may be fear of litigation. These differences in national rates are likely to arise from a combination of factors, including the type of healthcare system, patient preferences and extent to which national clinical guidelines recommend VBAC. In the current study, the attempted cases of VBAC was 85 out of total of 108 cases of previous CS, who attended the antenatal OPD, out of which 75 cases refused to accept the VBAC and only 10 cases (11.76%) accepted to undergo trial of labor, which is comparable to study done in a tertiary care center in Eastern Nepal (11%) and another similar study done in Pakistan (10.4%) [1,34]. These rates are much lower than many other studies conducted in developed countries.

The acceptance for trial of labor in this study group was too less to come to any conclusion, similar to the study conducted by Knight, *et al.* where among such 50,000 women in England, just over one-half attempt to give birth vaginally. Mother's choice on mode of delivery is the most important single factor in offering trial of labor. In the context of less acceptance for VBAC studies conducted by clinicians in Germany and Ireland suggested that giving information early in the pregnancy helps to build a woman's confidence that she can achieve a VBAC. It can also help her to view VBAC as the "norm" which is vital [14]. Likewise, in our study thorough counseling of the patients about the VBAC did worked but it again raised the issue of continuity of care by the same obstetrician and midwives all the time. In teaching institution like ours, difficult to maintain the continuity of care by the same obstetrician and midwives all the time for one patient.

Less acceptance of the patients for trial of labor may also be due to the fear of labor pains and another most concerning issue to both patient as well as the doctor is the uterine rupture. We could observe, in this study there were 11 cases of scar dehiscence who had undergone repeat cesarean section, which again plays a vital role

in lowering the rate of VBAC due to fear of neonatal and maternal morbidity and litigation to the doctors. This study is unlike to study done in Peshawar, Pakistan by Qudsia Qazi, *et al.* where only 1/3rd of total previous C-section cases had VBAC, due to lack of sophisticated monitoring devices in their set up which was coinciding with figures by Yousaf, *et al.* and Elkhousy, *et al.* [8,23,24].

We had 80% success rate for VBAC for cases for non-recurrent causes of primary CS like fetal distress as reported by other studies showing high success rate of VBAC. A 60 to 80% success rate of vaginal birth after caesarean section has been reported by many authors [7,18]. Many cases could not be tried for VBAC in this study due to refusal by the patients. Attempts at vaginal delivery were abandoned, at every moment, when there was even a bit of suspicion of scar dehiscence and also to avoid neonatal morbidity and lastly patient's unwillingness thereafter, for trial of labor. Similar result was also obtained by study conducted at Tribhuvan University teaching hospital, Maharajgunj, Kathmandu by Pooja, *et al.* as VBAC remained at 0.15% to 0.7% [6].

During 1996-2000, the VBAC rate in California decreased from 23% in 1996 to 15% in 2000, a decline by 35% is reported after maternal race/ethnicity, age, insurance status, and education were stratified, a consistent downward trend in VBAC rates were observed for all populations. By education level, college graduates had the highest VBAC rates, and women with less than a high school education had the lowest rates; declines in VBAC rates were similar among women of all education level [13], as in the present study acceptance for the VBAC was more from the college graduates and declination were observed more among high school educated lot.

Studies have shown that women with Health Maintenance Organization coverage had the highest VBAC rates, and women with MediCal/Medicaid had the lowest rates [13]. Likewise the present study conducted in an institute, is a welfare hospital run by Nepalese Army where the medical expenses of the dependents of the army personal are free, so this factor also plays a major role for patients not accepting to undergo trial of labor as there is no financial burden on the patients. This may be the reason in the present study, patients refused to accept VBAC more than 88% refusal, and ultimately landing up into CS. This is a big financial burden to the institution.

Similar study in Taiwan, a population-based was done in June 2019 and reported that specifically, women from wealthier families

are less likely to undertake VBAC, while older women and women with higher fertility are more likely to undertake VBAC [3]. We evaluated that all study population belongs to army who all can maintain the standard of living may be the reason for reduced acceptance of VBAC in our institution similar to other studies.

Contrary to other studies [5], the acceptance for trial of labor was more from elderly age group in this particular study. It was observed that the success of VBAC was more with patients who had not crossed 40 weeks (i.e. between 38 - 39 weeks) in our study. Failed induction and scar dehiscence were observed, more in cases who had crossed 40 weeks. This was an important clinical observation for the decision of VBAC in future which is also supported by the retrospective study done in China and Thailand also concluded that women with <41 weeks, with spontaneous onset of labor were significantly more likely to achieve success of TOLAC [4,5,15]. In the delivery process, Bishop score ≥ 5 had successful TOLAC, whereas women with rupture of membrane and using oxytocin augmentation were significantly less likely to achieve success of VBAC [5]. A cohort study conducted in Thailand also showed that late gestational age was significantly associated with a higher failure rate.

This study further strengthens the observations made by previous studies that the success of VBAC is more in cases where an emergency LSCS was performed in the previous pregnancy. In this study all successful VBAC had emergency C-section previously. So, we recommend that a fair trial of VBAC should be given to all the patients who fulfill the criteria of RCOG/ACOG for VBAC with a single previous CS. Spontaneous progress of labor was a favoring point for the successful VBAC in the present study, we observed that 5 patients who had successful VBAC all had spontaneous onset of labor which gave 100% success for VBAC, whereas cases induced with oxytocin followed by rupture of membrane had failed induction and scar dehiscence. Due to small sample size of the accepted cohort, difficult to comment on women with prior vaginal birth were three times more likely to achieve success of TOLAC as other studies had reported. Contrary to this, among the unaccepted cohort the patients who had vaginal delivery in previous pregnancy none had accepted for trial of labor may be due to fear of labor pains and concern for neonatal morbidity.

Vaginal birth after caesarean section is associated with short period of hospitalization, less blood loss and fewer transfusions, fewer infections and fewer thromboembolic events than caesarean

delivery. Several reports have indicated that the absolute risk of uterine rupture, attributable to a trial of labor is about 1 per 1000. A successful VBAC has fewer complications than an elective repeat caesarean. In the present study too, there was no case of uterine rupture, lesser transfusion and infections were encountered in VBAC group.

The hospitalization for repeat caesarean is much more than the successful VBAC due to wound infection, increase blood loss during C-section leading to blood transfusions. This is another positive impact of VBAC we could observe in our study, like other studies. The average duration of hospital stay for VBAC was 4.59 days, whereas it was 8.4 days requiring repeat caesarean section [4]. Benson, *et al.* carried out a survey of the benefits of successful VBAC and found out that a shorter hospital stay in a VBAC delivery has a positive impact on psychology of the woman and decreases the total cost of hospitalization [4,35]. Similar observations were made by other workers [4].

Carmen B Young in 2018 comparing maternal and fetal outcomes after attempted vaginal birth after caesarean delivery versus repeat cesarean delivery. (10.7v5.65 per 1000 deliveries, respectively). His results interpreted that although absolute rates of adverse outcomes are low, attempted vaginal birth after cesarean delivery continues to be associated with higher relative rates of severe morbidity and mortality in mothers and infants. The association between vaginal birth after cesarean delivery, and serious neonatal morbidity and mortality showed a temporal worsening (adjusted RR 0.94, 95% CI to 1.15 in 2003 - 2005; adjusted RR 95% CI 1.83 to 2.35 in 2012-2014) [16]. Like our study where the neonatal morbidity was more in failed VBAC with APGAR < 6 was 80% whereas in elective repeat CS cases there was only 36%. NICU admission was 20% in failed VBAC group whereas 12% in elective repeat CS cohort. The scar dehiscence in the failed VBAC group was 20% whereas in the elective repeat CS cases it was reported to be 12% [16].

There was no maternal mortality in the present study. Neonatal morbidity in the form of low APGAR score (<6) in 1 minute was observed more in failed VBAC group up to 80% due to failed induction and prolong labour with cord around the neck. All three babies had developed birth asphyxia for transient period. Admitted in NICU for observation. They received prophylactic antibiotics and breast feeding and were discharged from the hospital with their mothers.

On the contrary to our study research article of Jha., *et al.* [30], found that infants born after successful VBAC (36%) had the lowest rates of NICU admission and the lowest resuscitation needs; those born otherwise (13%) had the highest resuscitation needs [8,29]. Qazi., *et al.* demonstrated in his study that failed TOL are at increased risk of jeopardized fetal conditions and operative interference should be made in time if complications like fetal or maternal distress comes into the picture, thus fetuses in jeopardized conditions had low APGAR score and needed NICU admission. Thus, clinician must respect patient's autonomy and decision-making capabilities while considering route of delivery after counseling her about all maternal and fetal risks [8,29].

Maternal as well as neonatal morbidity is three times more in cases which had repeat caesarean section and failed VBAC, than with those with successful VBAC. This study has similar results, as study conducted in Maharashtra, India by Vidhyadhar B Bangal., *et al.* However, our study did not reveal any perinatal mortality or maternal mortality other than scar dehiscence 20% in TOLAC group which is the same reported worldwide. Similar observations were made by other workers.

Strength and Limitation

The strength of this study was the methodology, the use of inclusion and exclusion criteria.

The study was subject to several limitations. First a very high percentage of women (88.23%) made a request of repeat CS by themselves or their family members among the participants with previous CS. The sample size is too much limited to estimate the maternal and neonatal adverse events in VBAC, which were the secondary outcomes in our study. The sample size was very small to calculate the success of VBAC. In addition, the development of the prediction model was based on a cohort of women who attempted TOLAC, while some women who were good candidates for TOLAC, chose an elective caesarean section.

Another issue is the reliability of the history given by the patients, where the documents were missing.

Conclusion

Stringent selection criteria and meticulous intra partum monitoring for VBAC often leads to successful VBAC. It helps in reduction rate of caesarean section and thereby reducing maternal morbidity due to repeat CS.

Proper counselling for trial of scar and evaluation of the case has been considered as a key method of reducing the CS rate. Majority of the cases of previous CS done for non- recurrent 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 CS. This research should encourage Obstetricians to encourage VBAC in the properly screened antenatal patients and decrease the rate of CS. This not only decreases the financial burden to the organization but also helps in decreasing the health care expenditure and avoid over-crowding in the Army run tertiary care hospital like ours.

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Conflict of Interest

None declared.

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