

Outcome of Vaginal Birth after One Cesarean Section in Spontaneous Onset of Labour

Dr. Kazi Farhana Begum^{1*}, Dr. Mehera Parveen², Dr. Nigar Sultana³,
Dr. Selima Kawser⁴, Dr. Farah Noor⁵

¹Medical officer, Department of Obstetrics and Gynaecology, Bangabandhu Sheikh Mujib Medical University, Shahbag, Dhaka, Bangladesh

³Medical officer, Department of Obstetrics and Gynaecology, Bangabandhu Sheikh Mujib Medical University, Shahbag, Dhaka, Bangladesh.

⁴Medical officer, Department of Obstetrics and Gynaecology, Bangabandhu Sheikh Mujib Medical University, Shahbag, Dhaka, Bangladesh.

Senior Consultant, Department of Obstetrics and Gynaecology, Bangabandhu Sheikh Mujib Medical University, Shahbag, Dhaka, Bangladesh.

⁵Medical officer, Department of Obstetrics and Gynaecology, Bangabandhu Sheikh Mujib Medical University, Shahbag, Dhaka, Bangladesh.

Corresponding Author: Dr. Kazi Farhana Begum, Medical officer, Department of Obstetrics and Gynaecology, Bangabandhu Sheikh Mujib Medical University, Shahbag, Dhaka, Bangladesh

Abstract

Background: Concern about repeat cesareans and their associated risks has prompted an interest in the feasibility and safety of vaginal birth after cesarean (VBAC). Therefore, in women with one previous cesarean and spontaneous labor onset, vaginal birth after cesarean section represents potential alternative to election repeated cesarean section (ERCS) as it can lessen risks of surgical complications, more rapid recovery and mom's morbidity. This study aims to determine maternal and neonatal outcomes in women delivered by vaginal birth after cesarean section after a single prior cesarean section with spontaneous labor onset.

Methods: A cross sectional study at Bangabandhu Sheikh Mujib Medical University from 2016 to 2017 using 60 women who met inclusion criteria of one prior cesarean and spontaneous labor onset. Demographic details, labor progression, delivery mode as well as outcomes were used as data. Descriptive statistics for categorical data were run as well as comparative analysis of vaginal birth after cesarean section success vs election repeated cesarean section.

Results: From the 60 participants, 80% delivered spontaneously and successfully, 16.67% developed it and needed election repeated cesarean section due to labor complications or fetal distress. In 3.33% of cases instrumental vaginal delivery was necessary. No cases of major neonatal complications were reported and neonatal outcomes were favorable. Moreover, maternal outcomes were good, low incidence of uterine rupture and postpartum complications.

Conclusion: Women with one previous cesarean who had vaginal birth after cesarean section after spontaneous labor onset following appropriate planning had outcome similar to previous publication of low risk circumstances. Finally vaginal birth after cesarean section is supported by favorable maternal and neonatal outcomes as an alternative to election repeated cesarean section.

Keywords: Spontaneous labor, maternal outcomes, neonatal outcomes, cesarean section, vaginal birth after cesarean, vaginal birth after cesarean section success rate.

I. Introduction

The interest in vaginal birth after cesarean (VBAC) in women with a single previous cesarean section, spontaneous labor, is an area of interest in obstetrics for the potential benefit over repeat cesarean sections (RCS). As the number of cesarean births around the world has been increasing, so have concerns about the long term health hazards associated with multiple cesarean births, both for mother and baby. While necessary in many cases, cesarean sections come with risks such as adhesions, placental abnormalities in future pregnancies, and surgical complications.^{1,2} A number of studies indicate that vaginal birth after cesarean section is associated with fewer postpartum complications, a shorter recovery time, and lower maternal morbidity than RCS, and that it is an attractive option for those with factors such as optimal supine position.^{3,4}

Several factors, including indications for the first cesarean, interval between deliveries, maternal age and route of labor, play a role in vaginal birth after cesarean section success and safety. There are, however, two specific risk factors that are exemplary in the significant: spontaneous labor onset, which tends to be

associated with a higher vaginal birth after cesarean section success rate and less concentrated risk for the challenges including uterine rupture in contrast to induced labour which just isn't without its very own slightly increased risk profile.⁵⁻⁷ vaginal birth after cesarean section success rates of 60–80% for spontaneous labor onset indicate that natural labor onset is a beneficial factor for women attempting vaginal birth after cesarean section^{8,9}. The American College of Obstetricians and Gynecologists (ACOG) and the Royal College of Obstetricians and Gynaecologists (RCOG) therefore recommend offering a trial of labour following a low transverse uterine scar and absence of contraindications, such as previous uterine rupture or extensive uterine surgery.^{10,11}

Personalized counseling regarding vaginal birth after cesarean section outcomes is dependent on completing an examination of maternal and newborn outcomes for spontaneous labor onset cases of vaginal birth after cesarean section. Indeed, vaginal birth after cesarean section is associated with favorable neonatal outcomes compared with RCS, involving less respiratory distress, and lower need for NICU, according to studies.^{12,13} When singleton labor begins spontaneously, these benefits are especially marked as cesarean deliveries without labor have an increased risk of respiratory complications in the neonate including transient tachypnea. Although vaginal birth after cesarean section is not without risk, uterine rupture retains a major complication, albeit of rare incidence, that can have devastating implications for maternal and neonatal health. The incidence of uterine rupture in vaginal birth after cesarean section cases is 0.5-1 per cent and labor induction associated with slightly higher incidence, as for selection of candidates and monitoring of labor, both vaginal birth after cesarean section cases require closely monitoring during labor.^{14,15}

This study is designed to evaluate maternal and neonatal outcomes in women attempting vaginal birth after cesarean section after spontaneous labor after a single prior cesarean section. Thus, we pursue contributions to the growing evidence on vaginal birth after cesarean section safety, feasibility, and benefit, with particular focus on outcomes in this specific population. This study will present current maternal and neonatal health indicators to provide health care providers with data that can enable more informed decision making and counseling regarding vaginal birth after cesarean section for women who are contemplating vaginal birth after cesarean section. The goals are to articulate the risks and benefits of a vaginal birth after cesarean section within the context of spontaneous labor and iterate refinement of recommendations for women with a history of cesarean delivery who are eligible for a trial of labor, to support a patient centered delivery choice.

II. Objectives

The objective of this study were to assess maternal and neonatal outcomes following a trail of vaginal birth after one previous cesarean section with spontaneous labor onset.

III. Methodology & Materials

This cross-sectional study was conducted at Bangabandhu Sheikh Mujib Medical University (BSMMU) over a one-year period, from 2016 to 2017, with a sample size of 60 women who had a history of one previous cesarean section and presented with spontaneous labor onset.

Inclusion Criteria:

- Women with a single previous cesarean section.
- Presence of a low transverse uterine scar.
- Spontaneous onset of labor.
- Absence of contraindications to vaginal delivery.

Exclusion Criteria:

- History of more than one previous cesarean section.
- Presence of a classical or vertical uterine scar.
- Malpresentation of the fetus.
- Diagnosis of placenta previa.
- Presence of any obstetric or medical condition contraindicating vaginal delivery.

Data collection: Data was collected through structured interviews and clinical assessments conducted at admission. Information included demographic characteristics, labor progress, mode of delivery, and maternal and neonatal outcomes.

Statistical analysis of data: Collected data was analyzed using statistical software to calculate frequencies and percentages for categorical variables, while continuous variables were summarized as means and standard deviations. Comparative analysis was conducted to evaluate outcomes between successful vaginal births and repeat cesarean sections.

IV. Result

Table 1: Patients Demographic and Maternal Characteristics (n=60)

Characteristics		Frequency(n)	Percentage (%)
Age	18-25	26	43.30%
	26-33	29	48.30%
	34-41	5	8.30%
Residence	Rural	23	38.30%
	Urban	37	61.70%
Education	Primary	5	8.30%
	Secondary	37	61.70%
	Tertiary	18	30.00%
Parity	1	35	58.33%
	2	14	23.33%
	3	10	16.67%
Gravida	2nd	35	58.33%
	3rd	15	25.00%
	4th or more	10	16.67%
Gestational Age	<35 weeks	11	18.33%
	35-38 weeks	37	61.67%
	>38 weeks	12	20.00%

Demographic and maternal profile of participants undergoing trial of labor after one previous cesarean section (vaginal birth after cesarean section) (n=60) is described in Table 1. A similar smaller proportion (8.3%) was aged 34-41, indicating a younger population trying vaginal birth after cesarean section. Most (61.7%) of the participants resided in urban areas, although improved access to care facilities may suggest this. The percentage educated is 61.7% that has finished secondary education; 30 that took tertiary education, thus moderately educated. Most women (58.3%) were nulliparous, with similar ratios in subsequent gravid states, suggesting a nominally younger, first time vaginal birth after cesarean section candidate. Most (61.7%) had delivery gestational age in the 35–38 week range, and only about 20 % was > 38 weeks, indicating that the medical team was hesitant to schedule delivery in those who were previous cesarean.

Table 2: Mode of delivery following trial of vaginal birth after cesarean section(n=60)

Mode of delivery	Frequency	Percentage (%)
Spontaneous vaginal delivery	48	80.00%
Repeat lower segment cesarean section	10	16.67%
Vaginal instrumental delivery	2	3.33%

Delivery outcomes, including after a trial of labor, are shown for this population in Table 2. Findings from the data show 80% of participants had successful spontaneous vaginal delivery, making vaginal birth after cesarean section under controlled conditions associated with high rates of success in achieving spontaneous labour and reflective of existing research that spontaneous labour increases vaginal birth after cesarean section success rates. A smaller segment (16.67%) required repeat lower-segment cesarean section, which may have been attributable to factors including labor progression or fetal distress. For intrusive intervention there were only 3.33% instrumental vaginal delivery, therefore, minimal invasion was provided. Together, these results underscore the feasibility of vaginal birth after cesarean section in patients at high risk of complication from TOL, given that the latter have close monitoring and access to emergency surgical intervention.

Table 3: Clinical findings of patients (n=48)

Variables		Frequency	Percentage (%)
Placenta	Normal	45	93.75%
	Small macerated	3	6.25%
Bleeding	Average	42	87.50%
	More than average	6	12.50%
Liquire	Clear	39	81.25%
	Deep meconium stained	6	12.50%
	Moderately stained	2	4.17%
	Nil	1	2.08%
Scar condition	Without injury	46	95.83%
	Rapture scare	2	4.17%

The findings of those who attempted vaginal birth after cesarean section (n=48) are summarized in Table 3 on a placental health, bleeding levels, amniotic fluid status and scar integrity. Ninety three and three quarters (93.75%) of the patients had normal placentas and half had small macerated placentas which may suggest prior stress by the mother or fetal stress. In 87.5% of cases, bleeding levels were average; in 12.5% bleeding levels were greater than average, a key safety factor for vaginal birth after cesarean section . The majority of cases (81.25%) had a clear amniotic fluid; 12.5% had deep meconium staining and was suggestive of fetal distress. In terms of scar condition, ~ all patients (95.83%) had an intact uterine scar with only 4.17% scar rupture, an expected but low incidence rate compared to vaginal birth after cesarean section settings. It is important to emphasize the value of careful clinical parameter checking in vaginal birth after cesarean section attempts to maintain maternal and neonate safety.

Table 4: Birth weight of baby the baby (n=48)

Birth weight	Frequency	Percentage
<2.5 kg	26	54.17%
2.5-3.5 kg	22	45.83%
>3.5 kg	0	0

The distribution of birth weights of newborns born after vaginal birth after cesarean section is shown in Table 4. The birth weights of the infants showed a prevalence of lower birth weights (54.17%) among the infants over half the infants (54.17%) had a birth weight of less than 2.5 kg. Factors like early delivery to minimize complications, maternal health and underlying growth restrictions may be associated with it. Cyr d'Etudes des Importations Exécuté par le Holdichertachitte Français. Supplement Birth weight distribution provides insights into neonatal outcomes following vaginal birth after cesarean section , and highlights the importance of tailored postnatal care for potential low birth weight implications with their implications for initial neonatal health and development.

V. Discussion

This study was describe the maternal and neonatal outcomes in women with a single prior cesarean and spontaneous labor onset who attempted vaginal birth after cesarean (VBAC). The findings are also notable in that, both in terms of spontaneous labor and, generally, for maternal and neonatal outcomes, vaginal birth after cesarean section performed as well as did TNC under these conditions.

Most vaginal birth after cesarean section candidates were younger women (10% aged 26–33, 85% aged 24–29), residing in urban areas, and secondary education. Prior studies have found that these characteristics are associated with a more favorable outcome in particularly with respect to vaginal birth after cesarean section .²⁻⁴ Better healthcare access often comes with urban residency, an important factor in managing vaginal birth after cesarean section safely, as it enhances the close monitoring needed to safely manage complications.⁴

Results of the mode of delivery indicated that 80% of participants had spontaneous vaginal delivery, which showed a good outcome for vaginal birth after cesarean section in case labor starts spontaneously. These findings consistent with previous reports of vaginal birth after cesarean section success rates fluctuating between 60 and 80% in cases of spontaneous labor onset.⁹ Spontaneous labor onset may have contributed to our

success with vaginal birth after cesarean section in our study, as uterine rupture and maternal morbidity risks are decreased with spontaneous labor onset versus induced labor.¹ Such supporting reports indicated that about 15 to 20 percent of vaginal birth after cesarean section trials will need a repeat cesarean for reasons similar to such as labor progression complications or fetal distress.^{5,13} The low incidence of instrumental vaginal delivery (3.33%) indicates a cautious approach because studies show that strategic avoidance of excess intervention during vaginal birth after cesarean section can reduce risks to both mother and baby.¹⁶

Clinical findings in vaginal birth after cesarean section candidates were excellent, with 93.75% of patients having normal placentae, 87.5% at average bleeding and 81.25% being clear amniotic fluid. The success rate of vaginal birth after cesarean section depends on these clinical markers (clear amniotic fluid) which correlate with fetal well being and the decreased need for emergency interventions. vaginal birth after cesarean section is also associated with lower rates of NICU admissions in neonates than elective repeat cesarean section (election repeated cesarean section).¹² Moreover, scar rupture was reported in only 4.17% of participants, consistent with uterine rupture risks in vaginal birth after cesarean section trials of 0.5-2% among spontaneous labors with the exception of recent trials in which the risks ranged up to 7.5%.^{10,11} The results reiterate that vaginal birth after cesarean section can be carried out safely under vigilant observation in well selected candidates who come to labor spontaneously and that emergency surgical facilities are available.¹⁷

Observation of the majority of neonatal births weights the neonatal births weights below 2.5 kg in 54.17% with no neonatal births weights exceeding 3.5 kg. This might suggest that in cases with possibly lower birth weights, delivery timing was favored with a cautious approach, to avoid stress on the uterine scar during labor. Lower birth weights in the vaginal birth after cesarean section settings are better since they have been shown to be associated with lower labor stress, that may also result in a lower risk of uterine rupture, as was observed in this study.⁴ Nevertheless, these infants require more neonatal care since research indicates that infants born with lower weights, while less likely to suffer respiratory distress than election repeated cesarean section infants, do benefit from close postnatal monitoring.¹⁶

This study is in agreement with the guidelines of the American College of Obstetricians and Gynecologists (ACOG) and the Royal College of Obstetricians and Gynecologists (RCOG), who have identified vaginal birth after cesarean section as a safe alternative for women who were low transverse cesarean scar previously and without contraindications.¹⁰ In managing vaginal birth after cesarean section, it is imperative to offer vaginal birth after cesarean section, especially under controlled conditions with immediate surgical support available, to minimize overall cumulative risks related with several cesareans including placental abnormality and adhesion which increase with repetitive operations. This study adds to the evidence that vaginal birth after cesarean section is a safe and effective option in women with well monitored cases in those optimal conditions.

VI. Conclusion

The present study illustrates that vaginal birth after cesarean section is possible and safe in women with a single prior cesarean and a spontaneous labor onset, provided appropriate monitoring and provision of emergency services. The findings underscore that, in appropriately selected cases, vaginal birth after cesarean section is a safe and effective alternative to repeat cesarean, with the potential to minimize cumulative surgical risks and to support favorable maternal and neonatal outcomes. Refining vaginal birth after cesarean section recommendations will continue to require continued research optimizing vaginal birth after cesarean section selection criteria and assessing long term neonatal outcomes.

VII. Limitations And Recommendations

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community. Further studies could also investigate how factors such as gestational age, maternal BMI and certain labor interventions affect vaginal birth after cesarean section outcomes in order to refine clinical guidelines.

Acknowledgment

I would like to express my sincere gratitude for the invaluable support and cooperation provided by the staff, participants, and my co-authors/colleagues who contributed to this study.

Financial support and sponsorship

No funding sources.

Conflicts of interest

There are no conflicts of interest.

Ethical approval

The study was approved by the Institutional Ethics Committee.

References

- [1]. Landon MB, Hauth JC, Leveno KJ, Spong CY, Leindecker S, Varner MW, Moawad AH, Caritis SN, Harper M, Wapner RJ, Sorokin Y. Maternal and perinatal outcomes associated with a trial of labor after prior cesarean delivery. *New England Journal of Medicine*. 2004 Dec 16;351(25):2581-9.
- [2]. Guise JM, Eden K, Emeis C, Denman MA, Marshall N, Fu RR, Janik R, Nygren P, Walker M, McDonagh M. Vaginal birth after cesarean: new insights. Evidence report/technology assessment. 2010 Mar 1(191):1-397.
- [3]. McMahon MJ, Luther ER, Bowes Jr WA, Olshan AF. Comparison of a trial of labor with an elective second cesarean section. *New England journal of medicine*. 1996 Sep 5;335(10):689-95.
- [4]. Smith GC, Pell JP, Cameron AD, Dobbie R. Risk of perinatal death associated with labor after previous cesarean delivery in uncomplicated term pregnancies. *Jama*. 2002 May 22;287(20):2684-90.
- [5]. 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. *Australian and New Zealand journal of obstetrics and gynaecology*. 2004 Oct;44(5):387-91.
- [6]. ACOG Practice Committee. ACOG Practice bulletin no. 115: Vaginal birth after previous cesarean delivery. *Obstet Gynecol*. 2010;116(2 Pt 1):450-63.
- [7]. Flamm BL, Goings JR, Liu Y, Wolde-Tsadik G. Elective repeat cesarean delivery versus trial of labor: a prospective multicenter study. *Obstetrics & Gynecology*. 1994 Jun 1;83(6):927-32.
- [8]. Hibbard JU, Ismail MA, Wang Y, Te C, Karrison T, Ismail MA. Failed vaginal birth after a cesarean section: How risky is it?: I. Maternal morbidity. *American journal of obstetrics and gynecology*. 2001 Jun 1;184(7):1365-73.
- [9]. Grobman WA, Lai Y, Landon MB, Spong CY, Leveno KJ, Rouse DJ, Varner MW, Moawad AH, Caritis SN, Harper M, Wapner RJ. Prediction of uterine rupture associated with attempted vaginal birth after cesarean delivery. *American journal of obstetrics and gynecology*. 2008 Jul 1;199(1):30-e1.
- [10]. Royal College of Obstetricians & Gynaecologists. Birth after previous caesarean birth. Green-top guideline. 2015 Oct 31(45).
- [11]. Grobman WA, Gilbert S, Landon MB, Spong CY, Leveno KJ, Rouse DJ, Varner MW, Moawad AH, Caritis SN, Harper M, Wapner RJ. Outcomes of induction of labor after one prior cesarean. *Obstetrics & Gynecology*. 2007 Feb 1;109(2 Part 1):262-9.
- [12]. Cahill AG, Waterman BM, Stamilio DM, Odibo AO, Allsworth JE, Evanoff B, Macones GA. Higher maximum doses of oxytocin are associated with an unacceptably high risk for uterine rupture in patients attempting vaginal birth after cesarean delivery. *American journal of obstetrics and gynecology*. 2008 Jul 1;199(1):32-e1.
- [13]. Shipp TD, Zelop CM, Repke JT, Cohen A, Lieberman E. Interdelivery interval and risk of symptomatic uterine rupture. *Obstetrics & Gynecology*. 2001 Feb 1;97(2):175-7.
- [14]. Spong CY, Landon MB, Gilbert S, Rouse DJ, Leveno KJ, Varner MW, Moawad AH, Simhan HN, Harper M, Wapner RJ, Sorokin Y. Risk of uterine rupture and adverse perinatal outcome at term after cesarean delivery. *Obstetrics & Gynecology*. 2007 Oct 1;110(4):801-7.
- [15]. Bujold E, Mehta SH, Bujold C, Gauthier RJ. Interdelivery interval and uterine rupture. *American journal of obstetrics and gynecology*. 2002 Nov 1;187(5):1199-202.
- [16]. Lydon-Rochelle M, Holt VL, Easterling TR, Martin DP. Risk of uterine rupture during labor among women with a prior cesarean delivery. *New England Journal of Medicine*. 2001 Jul 5;345(1):3-8.
- [17]. Clark EA, Silver RM. Long-term maternal morbidity associated with repeat cesarean delivery. *American journal of obstetrics and gynecology*. 2011 Dec 1;205(6):S2-10.