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Mode of delivery after Lower Segment Cesarean Section

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ABSTRACT

Background: Lower segment cesarean section is a common method of childbirth and its impact on future mode of delivery remains important for both mothers and clinicians. In the next pregnancy, the main choice is between repeat cesarean section and vaginal birth after cesarean. The decision depends on the healing of the previous uterine scar, maternal health, and hospital readiness for emergencies. **Objective:** To determine the frequency of mode of delivery in women with history of previous lower segment cesarean section. **Study Design:** Cross sectional study. **Duration and Place of Study:** The study was carried out from June 2024 to November 2024 in the Department of Obstetrics and Gynaecology, Mardan Medical Complex, Mardan, Pakistan. **Methodology:** A total of 169 women aged 20 to 35 years with one previous lower segment cesarean section and singleton term pregnancy were included. Data were collected on demographic and obstetric factors. Mode of delivery was recorded as elective cesarean section, successful vaginal birth after cesarean, or failed vaginal birth after cesarean. **Results:** The mean age was 28.40 years and mean gestational age was 39.05 weeks. Elective cesarean was performed in 39.60 percent of women. Vaginal birth after cesarean succeeded in 36.70 percent, while 23.70 percent failed and required emergency cesarean section. **Conclusion:** Mode of delivery after previous cesarean remains challenging. Success of vaginal birth after cesarean is moderate and depends on careful selection, proper monitoring, and institutional preparedness.

INTRODUCTION

Lower Segment Cesarean Section is a very common surgical method used for childbirth when normal vaginal delivery is not safe for mother or baby.[1] It involves a horizontal cut made on the lower part of the uterus just above the urinary bladder and through this cut the baby is taken out.[1] This method usually causes less bleeding the wound heals better and there are fewer complications after the surgery.[2] This technique has become popular because it minimizes the risk of uterine rupture in future pregnancies and gives better cosmetic results.[2] It is usually indicated in cases such as obstructed labor fetal distress placenta previa or failed induction.[3] The healing of the uterine scar depends on many factors like infection nutrition and maternal health.[4] The integrity of the lower uterine segment scar is very important in deciding how a woman can deliver in her next pregnancy.[5] Most women after a properly healed LSCS recover well and can carry future pregnancies successfully but the risk of scar dehiscence or rupture still remains a clinical concern.[5]

In the next pregnancy, mode of delivery after previous LSCS is an important obstetric decision, mainly between elective repeat cesarean section and vaginal birth after cesarean (VBAC).[6] Repeat cesarean is commonly performed when there are multiple previous cesareans, unfavorable cervix, or any contraindication for vaginal trial.[7] It is considered safer in situations where scar integrity is uncertain or when there is a narrow pelvis or malpresentation.[7] Elective repeat cesarean allows planned timing of delivery, reduces the risk of emergency surgery, and avoids the unpredictable complications of labor.[8] However, it carries increased risk of operative complications like adhesions, bleeding, and injury to surrounding organs, as well as delayed recovery.[8] Despite these, many obstetricians prefer repeat cesarean when the maternal and fetal conditions make vaginal delivery risky. Vaginal birth after cesarean is a possible mode of delivery which can be tried in carefully selected women having one previous lower segment cesarean section and no major obstetric problem.[9] It is mostly seen as safe when the previous uterine scar is healed well, the pelvis is adequate, and the labor is observed carefully throughout.[9] This kind of delivery helps to shorten hospital stay, reduce risk of infection, and lower maternal illness that happen with repeated cesarean surgery.[10] A successful vaginal birth after cesarean also gives mental satisfaction and faster recovery after delivery.[11] But it needs proper setup with quick arrangement for emergency cesarean if uterine rupture or fetal distress happens.[11] So, proper counseling, right patient selection, and careful intrapartum

monitoring are very important.

In a study by Balachandran L, et al. has shown that frequency of elective lower segment cesarean section was 23.4%, successful VBAC 63.58% and failed VBAC was 12.58% in women with history of previous lower segment cesarean section.[12]

There is need to do this study in Mardan because many women after lower segment cesarean section face different outcomes during delivery in next pregnancy this study will help to understand the safe mode of delivery in such cases and guide doctors and mothers for better decision it will also provide local data because condition of women in Mardan may be different from other regions.

METHODOLOGY

This study was carried out in the Department of Obstetrics and Gynaecology at Mardan Medical Complex Mardan and it took place from June 2024 to November 2024 it was a cross sectional study. Ethical clearance was taken from the hospital research and ethics committee before starting data collection. A total of 169 women were included and the sample size was estimated using WHO sample size software at 95 percent confidence level and 5 percent margin of error using expected frequency of failed vaginal birth after cesarean as 12.58 percent.[12] Participants were selected by non probability consecutive sampling. Women aged 20 to 35 years with singleton pregnancy of 37 to 41 weeks and previous cesarean were included while those with uterine rupture malpresentation placenta previa or intrauterine growth restriction were excluded.

Before data collection every participant was informed about the study and consent was taken. Demographic and clinical information like age gestational age body mass index parity socioeconomic and educational level occupation and residence were recorded in predesigned proforma. On admission detailed medical and obstetrical history was taken followed by general abdominal and pelvic examination and findings were marked on partogram. Continuous fetal monitoring and scar observation were done with cardiotocography during labour till delivery and women were kept under observation for twenty four hours after delivery and shifted to postnatal ward if stable. Mode of delivery was recorded by the researcher according to defined criteria.

Women who had cesarean scheduled before expected date and decided more than one day before delivery were taken as elective cesarean cases while those who delivered baby placenta and membranes through birth canal were taken as successful vaginal birth after cesarean and those who developed fetal distress or labour lasting more than sixteen hours and converted to cesarean were labelled as failed vaginal birth after cesarean.

Data was analyzed using SPSS version 26 descriptive statistics such as mean and standard deviation were used for continuous variables and frequencies with percentages were presented for categorical data Shapiro Wilk test was used for checking normal distribution and chi square or Fisher exact test was applied to see association with significance level taken at p value equal or less than 0.05.

RESULTS

The study examined mode of delivery after lower segment cesarean section in 169 patients and the patient demographics are presented in Table I. The mean age of participants was 28.40±4.21 years with mean parity of 1.99±1.02 and mean gestational age of 39.05±1.43 weeks. The mean BMI was 26.77±2.07 kg/m^2. Regarding socioeconomic status 87 patients (51.5%) belonged to low socioeconomic class while 62 patients (36.7%) were from middle class and 20 patients (11.8%) were from high socioeconomic class. In terms of residential status 110 patients (65.1%) were from rural areas and 59 patients (34.9%) were from urban areas as shown in Table I.

Table 1

Patient Demographics

Demographics		Mean ± SD
Age (years)		28.40±4.21
Parity		1.99±1.02
Gestational Age (weeks)		39.05±1.43
BMI (kg/m^2)		26.77±2.07
Socioeconomic Status	Low n (%)	87 (51.5%)
	Middle n (%)	62 (36.7%)
	High n (%)	20 (11.8%)
Residential Status	Rural n (%)	110 (65.1%)
	Urban n (%)	59 (34.9%)

The frequency distribution of mode of delivery after lower segment cesarean section is presented in Table II. Among all participants 67 patients (39.60%) underwent elective LSCS while 102 patients (60.40%) did not undergo elective LSCS. Successful VBAC was achieved in 62 patients (36.70%) whereas 107 patients (63.30%) did not have successful VBAC. Failed VBAC occurred in 40 patients (23.70%) while 129 patients (76.30%) did not experience failed VBAC as shown in Table 2.

Table 2

Frequency of Mode of Delivery After Lower Segment Cesarean Section

Mode of Delivery		Frequency	%age
Elective LSCS	Yes	67	39.60%
	No	102	60.40%
Successful VBAC	Yes	62	36.70%
	No	107	63.30%
Failed VBAC	Yes	40	23.70%
	No	129	76.30%
	Total	169	100%

When age was stratified into ≤30 years and >30 years groups for elective LSCS 46 patients (42.2%) aged ≤30 years underwent elective LSCS compared to 63 patients (57.8%) who did not with p-value of 0.360 which was statistically insignificant. In age group >30 years 21 patients (35.0%) had elective LSCS while 39 patients (65.0%) did not. For successful VBAC in age ≤30 years group 38 patients (34.9%) had successful VBAC and 71 patients (65.1%) did not with p-value of 0.507. In age >30 years 24 patients (40.0%) achieved successful VBAC whereas 36 patients (60.0%) did not. For failed VBAC in age ≤30 years 25 patients (22.9%) experienced failed VBAC and 84 patients (77.1%) did not with p-value of 0.763. In age >30 years 15 patients (25.0%) had failed VBAC while 45 patients (75.0%) did not. When BMI was categorized as ≤25 kg/m^2 and >25 kg/m^2 for elective LSCS 14 patients (34.1%) with BMI ≤25 had elective LSCS

compared to 27 patients (65.9%) who did not with p-value of 0.408. In BMI >25 group 53 patients (41.4%) underwent elective LSCS while 75 patients (58.6%) did not. For successful VBAC in BMI ≤25 group 18 patients (43.9%) had successful VBAC and 23 patients (56.1%) did not with p-value of 0.271. In BMI >25 group 44 patients (34.4%) achieved successful VBAC whereas 84 patients (65.6%) did not. For failed VBAC in BMI ≤25 group 9 patients (22.0%) experienced failed VBAC and 32 patients (78.0%) did not with p-value of 0.766. In BMI >25 group 31 patients (24.2%) had failed VBAC while 97 patients (75.8%) did not. Regarding socioeconomic status and elective LSCS in low socioeconomic group 34 patients (39.1%) underwent elective LSCS compared to 53 patients (60.9%) who did not. In middle socioeconomic group 25 patients (40.3%) had elective LSCS while 37 patients (59.7%) did not. In high socioeconomic group 8 patients (40.0%) underwent elective LSCS whereas 12 patients (60.0%) did not with p-value of 0.988. For successful VBAC in low socioeconomic group 32 patients (36.8%) achieved successful VBAC and 55 patients (63.2%) did not. In middle socioeconomic group 21 patients (33.9%) had successful VBAC while 41 patients (66.1%) did not. In high socioeconomic group 9 patients (45.0%) achieved successful VBAC whereas 11 patients (55.0%) did not with p-value of 0.668. For failed VBAC in low socioeconomic group 21 patients (24.1%) experienced failed VBAC and 66 patients (75.9%) did not. In middle socioeconomic group 16 patients (25.8%) had failed VBAC while 46 patients (74.2%) did not. In high socioeconomic group 3 patients (15.0%) experienced failed VBAC whereas 17 patients (85.0%) did not with p-value of 0.621 using Fischer Exact Test as shown in Table 3.

Table 3

Association of Demographic Factors with Mode of Delivery After Lower Segment Cesarean Section

Demographic Factors		Elective LSCS		p-value	Successful VBAC		p-value	Failed VBAC		p-value
		Yes n(%)	No n(%)		Yes n(%)	No n(%)		Yes n(%)	No n(%)	
Age (years)	≤30	46 (42.2%)	63 (57.8%)	0.360	38 (34.9%)	71 (65.1%)	0.507	25 (22.9%)	84 (77.1%)	0.763
	>30	21 (35.0%)	39 (65.0%)		24 (40.0%)	36 (60.0%)		15 (25.0%)	45 (75.0%)	
BMI (kg/m^2)	≤25	14 (34.1%)	27 (65.9%)	0.408	18 (43.9%)	23 (56.1%)	0.271	9 (22.0%)	32 (78.0%)	0.766
	>25	53 (41.4%)	75 (58.6%)		44 (34.4%)	84 (65.6%)		31 (24.2%)	97 (75.8%)	
Socioeconomic Status	Low	34 (39.1%)	53 (60.9%)	0.988	32 (36.8%)	55 (63.2%)	0.668	21 (24.1%)	66 (75.9%)	0.621*
	Middle	25 (40.3%)	37 (59.7%)		21 (33.9%)	41 (66.1%)		16 (25.8%)	46 (74.2%)	
	High	8 (40.0%)	12 (60.0%)		9 (45.0%)	11 (55.0%)		3 (15.0%)	17 (85.0%)	

*Fischer Exact Test

DISCUSSION

The findings of current study showed that majority of patients 102 (60.40%) did not undergo elective LSCS while 67 patients (39.60%) had elective repeat cesarean section which indicates that significant proportion of women were considered for trial of labor after cesarean section. This finding suggests that obstetricians are increasingly offering vaginal birth after cesarean as an option to suitable candidates rather than automatically scheduling repeat cesarean deliveries. The successful VBAC rate was 36.70% in our study population which is relatively moderate and reflects the real world challenges associated with vaginal delivery after previous cesarean section. The lower success rate may be attributed to several factors including patient anxiety about uterine rupture and physician concerns regarding maternal and fetal safety during labor. The failed VBAC was 23.70% indicating the cases that trial of labor after cesarean was attempted but resulted in repeat cesarean section due to obstetric complications such as labour arrest, dystocia or non-reassuring fetal heart rate pattern. Clinical concern with this rate is that failed VBAC is often associated with more maternal morbidity than elective repeat cesarean, largely due to the increased duration of labor, emergency surgery and increased intraoperative blood loss. The average age of the mothers stood at 28.40 Marin and Standard Deviation of 4.21 years, which indicated that the majority of the women were at the most productive age bracket of reproduction as would be the case with the average obstetric population in our environment. The average parity was 1.99 and the range of parity was 1.02 indicating that the majority of the patients had one to two previous deliveries and this would be typical in VBAC indication following a single previous cesarean delivery. Mean gestational age was 39.05 +1.43 weeks with term pregnancies, which were fit to undergo labor trial since preterm or post term gestation would complicate the outcome of perinatal care. The average BMI was 26.77 plus or minus 2.07 kg/m 2 and this indicates that most of the women were a bit overweight and this is a very critical clinical circumstance since the greater the BMI, the less the VBAC success because of the augmented soft tissue resistance and potential cephalopelvic disproportion. In terms of social class, 87 (51.5) patients were in the low socioeconomic group that may influence the antenatal follow-up and advice on the delivery mode choice. Most of the women 110 (65.1%), were rural indicating the demographic make-up of our catchment population and potential delay in access to emergency obstetric intervention in instances of unsuccessful trial of labor.

The rate of successful VBAC was 36.70, which is not very high in comparison with other obstetric facilities. In Ayub Teaching Hospital, Abbottabad, 64.7% success was found by Qazi L et al. [13] a fact that is likely attributed to improved case selection, close intrapartum observation, and oxytocin and emergency measures. Alani WY et al. [14] recorded 41.5% success in Bahrain a bit higher than ours, perhaps due to a large proportion of total vaginal deliveries and higher parity, known to raise VBAC success. According to a report by Patil SR et al. [15] in Karnataka, India, 58% were successful, which could be attributed to the 58% better pre-labor assessment and favorable Bishop score on admission. Masoom K et al. [16] found success of 56% at PIMS, Islamabad, and more so at spontaneous labor

(58.8) than induction (10%), thus our lower rate might be due to more induced labors or bad cervix. Similar risk profiles were reported by Bari A et al. [17] who reported 48.4% success at Civil Hospital, Karachi with Flamm and Geiger score. Nisa Q et al. [18] Sadaf R et al. [19] and Kashif S et al. [20] found 58 percent, 72 percent, and 58 percent respectively, revealing that hospital set up, adequate antenatal registration, patient counseling and spontaneous births onset are powerful factors behind VBAC achievement.

The failed VBAC rate was 23.70% which included the cases which needed emergency cesarean after trial of labor which is similar to Masoom K et al. [16] who reported 44% and Nisa Q et al. [18] who reported 41.7. Major reasons to failure were fetal distress, arrest of labour and failed induction as was reported by Patil SR et al. [15] and Nisa Q et al. [18] where fetal distress caused about 34-36.5% failures. As reported by Abbasi AN [21] improper case selection and inadequate intrapartum surveillance can also increase the risk of failure and this is why the outcomes of VBAC are institutionally different.

Maternal age was not significantly related with VBAC success (p=0.507), which is similar to the results of Qazi L et al. [13] and Alani WY et al. [14] yet older maternal age is typically associated with a higher number of obstetric complications and low efficiency of the uterus. Our cohort maternal age mean was 28.40 +/- 4.21 years and had a very low effect on the outcome of delivery. Similarly, the correlation of BMI was not significant (p=0.271), which is consistent with Masoom K et al.[16] and Kashif S et al. [20] but consistent with Alani WY et al. [14] (p=0.117). The small range of the BMI (mean 26.77 ± 2.07 kg/m 2) in our series could have reduced the statistical power to identify differences. The social economic status was also not significant (p=0.668) and it agrees with Qazi L et al. [13] which suggests that uniform care in hospitals minimizes the impact of social inequality. Rural residence, which was found in 65.1% of participants did not favor the successful VBAC as compared to Qazi L et al. [13] (p=0.049], but perhaps because of the late hospital presentation, fewer antenatal visits, and logistical factors among the rural women.

The average gestational age was 39.05+ 1.43 weeks, which compares to Alani WY et al. [14] and Qazi L et al. [13] who reported that term pregnancy (less than 39 weeks) is correlated with a good VBAC success (p=0.028). Mean parity was 1.99 + 1.02, with prior vaginal birth and parity being the key positive predictors, as reported by Alani WY et al. [14] and Kashif S et al. [20] in their studies, and were present in 79% of their successful VBAC. The rate of elective cesarean section 39.60% indicates that, most of the patients either desired or were indicated to have planned repeat cesarean section which has also been replicated in a number of tertiary care hospitals.

The most desirable fact was spontaneous onset of labor. Masoom K et al. [16] reported 58.8% success in spontaneous and 10% in induced labor whereas Nisa Q et al. [18] recorded 67.0% spontaneous cases. Abbasi AN [21] recommended that no induction of prostaglandin should be done because it may lead to uterine rupture. The comparatively low VBAC success rate in the given study demonstrates the necessity to enhance the patient selection, the prenatal information, the alertness of intrapartum conditions monitoring, and the overall institutional readiness of the emergency cesarean delivery, which is in line with the views of Abbasi AN [21] who highlighted the necessity to continue the fetal monitoring and ethical care as the only means of safe practice of VBAC.

This study had certain limitations which should be taken into consideration when interpreting the results. It was a single-centre study conducted in one tertiary care hospital which limits the generalization of the study to other clinical settings with different patient load, obstetric practices as well as resource availability. The sample size of 169 patients was relatively low and may have reduced the statistical power to demonstrate significant relationships between the maternal variables and the delivery outcomes and this was particularly when comparisons were conducted in sub groups. The design of the study was cross-sectional and, thus, evaluating long-term maternal or neonatal outcomes and post-discharge complications was not possible. There was no testing of certain vital obstetric variables such as Bishop score upon admission, cervical dilatation and effacement degree, previous cesarean indication, interval between pregnancies and mode of labor onset (spontaneous or labor induction), which are known factors in VBAC success. In addition, the lack of information about antenatal counselling and maternal preference concerning mode of delivery restricts the knowledge of psychological and clinical determinants of decision of elective cesarean section or trial of labor.

CONCLUSION

Our study has concluded that mode of delivery after lower segment cesarean section remains challenging clinical decision with moderate success rate for vaginal birth after cesarean section in our setting. The majority of women with previous cesarean section were offered trial of labor however successful vaginal delivery was achieved in only about one third of cases while failed attempts requiring emergency cesarean occurred in significant proportion.

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