

## A study on outcome of trial of labour after cesarean (TOLAC) with one previous caesarean delivery

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### Abstract:

**Background:** The rate of primary cesarean section (CS) is on the rising trend. More and more women report to ANC OPD with a history of a previous cesarean delivery. Vaginal birth after cesarean section can be an effective alternative to cesarean section and decrease the complications associated with repeat cesarean. **Objectives:** This study aims to determine acceptability and outcome of TOLAC in women with one previous cesarean delivery in a tertiary care centre. **Methods:** The prospective observational study was carried out in a tertiary care teaching hospital over a period of one year. Sixty pregnant women with a history of one previous LSCS were enrolled in the study. **Results:** In the present study, a total of 60 cases with previous LSCS were included. 78.33% cases had a successful TOLAC i.e vaginal birth after cesarean (VBAC) and 21.67% underwent a repeat emergency LSCS for failed TOLAC. Cervical dilatation of 4 cm and more at the time of admission was a significant factor for successful TOLAC. Having a previous vaginal birth also had a favourable prognosis in achieving a VBAC (89%). Birth weight of more than 3,000 gm was associated with a lower success rate of TOLAC. The incidence of scar dehiscence was 1.6% in the present study. There was no maternal or neonatal mortality. **Conclusion:** TOLAC in selected cases has great importance in the present era because of the rising rate of primary CS. With continuous efforts and proper antenatal counseling TOLAC can be attempted with very low complication rates. This will further decrease the untoward complications associated with repeat cesarean.

**Keywords:** TOLAC, VBAC, cesarean delivery, pregnancy.

Acceptable cesarean delivery rate is one of the debatable and controversial topic in today's obstetrical practice. Wide variation in cesarean delivery rate and TOLAC (Trial of labour after cesarean) / VBAC (vaginal birth after cesarean) rate has been noticed between different private and teaching maternity care institution. Present obstetrics practice has changed from "once cesarean, always cesarean" to implement TOLAC / VBAC after through clinical and situational assessment. The overall cesarean delivery rate in England for 2012– 2013 was 25.5%; the majority were emergency (14.8%) rather than elective (10.7%) cesarean births<sup>1</sup>. Hence, counselling women for and managing birth after cesarean delivery are important issues. There is a consensus National Institute for Health and Care Excellence (NICE), Royal College of Obstetricians and Gynaecologists (RCOG), American College of Obstetricians and Gynaecologists (ACOG) / National Institutes of Health (NIH) that planned VBAC is a clinically

safe choice for the majority of women with a single previous lower segment caesarean delivery<sup>2,3</sup>. Such a strategy is also supported by health economic modelling and would also at least limit any escalation of the caesarean delivery rate and maternal morbidity associated with multiple caesarean deliveries. Implementation of a VBAC versus elective repeat caesarean section (ERCS) checklist or clinical care pathway is recommended to facilitate best practice in antenatal counselling, shared decision making and documentation.

Nevertheless, a previous CS does cast a shadow over the outcome of future pregnancies<sup>4,5</sup>. With present techniques and skill, the incidence of caesarean 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. Hence, the present study was undertaken to assess the success and safety of TOLAC in selected cases of one previous lower segment caesarean section (LSCS) / caesarean delivery and to evaluate the maternal and fetal outcome in these cases.

## Material and methods

This prospective observational study was carried out in postgraduate department of gynaecology and obstetrics, SMGS hospital Jammu, a tertiary care teaching hospital located in urban area of northern India from January 2018 to December 2018. This hospital gets referrals of high-risk cases from neighbouring villages and towns. Retrospective analysis of hospital delivery data revealed that approx. 24000 deliveries took place annually in the hospital with the rate of CS ranging between 25 and 30%. A total of 60 cases of a previous CS were selected either from the outpatient department (booked) or in labor (booked / unbooked). Booked cases were regularly followed up in the antenatal clinic and the unbooked patients, who reported directly for labor, were then assessed for a TOLAC after obtaining informed written consent. A study protocol was submitted to the institutional ethical committee of GMC Jammu, and approval was obtained 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 written 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 60 cases that fulfilled the selection criteria were enrolled in the study. Proper counselling was done in the antenatal period for TOLAC. The women who were admitted in the ward at 40 weeks if they did not develop spontaneous onset of labour and were given foley's catheter induction after through clinical and pelvic assessment by consultant / head of unit. On admission a repeat USG was done to assess the scar thickness and estimated foetal weight<sup>6,7</sup>. All cases which were selected for TOLAC were monitored using continuous electronic monitoring in active labor. Labor was assessed by using modified WHO partogram.

Statistical analysis: Relevant information on maternal and foetal parameters including outcome of the present pregnancy, age, parity, interval between present pregnancy and previous LSCS were collected in structured proforma, entered in Microsoft Office Excel format, and statistical analysis was performed using SPSS software (version 20.0).

## Results

Total 60 cases were participated the study during the study period. Mean age of study population was  $26.92 \pm 3.61$  years (age  $\pm 1$  SD) (figure 1). Out of a total of 60 patients studied, 36 (26%) belonged to age group 26-30 years, followed by 13 (21.67%) in the group 21-25 years and 11 (18.33%) in 31-35 years age group. There were 45 (75%) patients with para 1, followed by 8 (13.33%) para 2 and 7 (11.67%) para 3 or more. Our study comprised of 27 (45.00%) women with 37<sup>+0</sup> - 37<sup>+6</sup> weeks period of gestation (POG), followed by 20 (33.33%) women with 38<sup>+0</sup> - 38<sup>+6</sup> weeks POG, 11 (18.33%) women with gestational age of 39<sup>+0</sup> - 39<sup>+6</sup> weeks POG and least number of patients i.e. 2 (0.04%) were of gestational age of 40 weeks onward POG (table 1).

In our study majority patients belonged to the inter delivery interval of 2-4 yrs (41/60 68.33%). Only 8 patients of study group opted to undergo TOLAC had inter delivery interval of less than 2 years (13.33%).

It was seen in our study that the maximum women presented with cervical dilatation of 4 cm and more at the time of admission in the hospital (60%) and they had a better chance (88.89%) of VBAC than women with a dilatation of less than 4 cm (62.5%). The overall success rate of TOLAC done in our study was 78.33% (47/60). The indications of previous CS in these cases were non recurrent type like fetal distress, mal-presentations, pre-eclampsia, premature rupture of membranes, and postdated pregnancy. On the other hand, the success rate of TOLAC among patient group where previous CS was done for indications like non progress of labor, was statistically significant lower proportion.

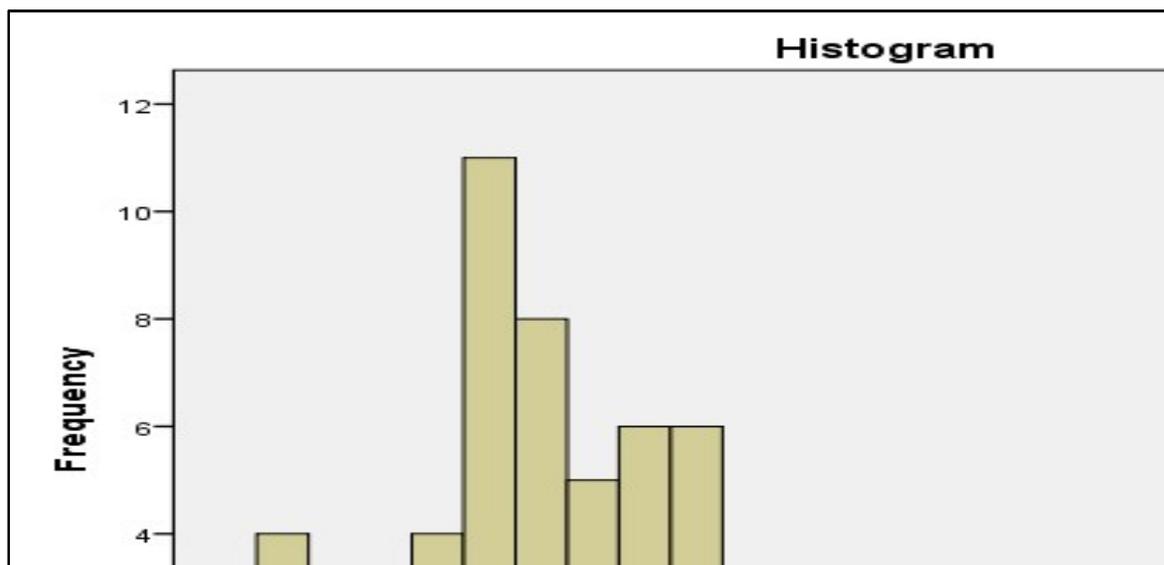


Figure 1: Age distribution of study population

Characteristics	Frequency (n)	Percentage (%)
Age group in years	21 to 25	21.67
	25 to 30	60.00
	30 to 35	18.33
Parity	1	75.00
	2	13.33
	3	11.67
Gestational age in weeks+days	37+0 to 37+6	45.00
	38+0 to 38+6	33.33
	39+0 to 39+6	18.33
	40+0 onwards	0.04
Inter delivery interval	Less than 2 yrs	13.33
	2- 4 yrs	68.33
	More than 4 yrs	18.34
Mode of delivery	VBAC	78.33
	Em LSCS	21.67
Cervical dialation	Less than 4cmm	40.00
	4 cm and more	60.00
Birth weight (NBB)	Less than 2.5 kg	25.00
	2.5 to less than 3 kg	68.33
	More than 3 kg	6.66

The indications of a repeat CS were fetal distress (30.76%), scar dehiscence (23.08%), non-progression of labour (23.08%) and failed induction (23.08%) respectively (table 2). It was further observed that women with a previous vaginal delivery had a better chance (88.89%) of a successful TOLAC as compared to women who did not have a previous vaginal delivery (76.47%). In the present study, there was only one case of scar rupture, one cases of bladder repair, 3 cases of puerperal pyrexia and one case of birth asphyxia. There was no stillbirth or neonatal death (table 3). The average duration of hospital stays for women having a VBAC was lower (2 days) than women who required a repeat CS (3-4 days).

Indications	Frequency (N = 13)	Percentage (%)
Non progress of labour	3	23.08
Failed induction	3	23.08
Fetal distress / fetal heart rate abnormality	4	30.76
Scar dehiscence	3	23.08

Maternal complications			
SL No	Nomenclature	Frequency (N =60)	Percentage (%)
1	Scar rupture	1	1.66
2	Bladder repair	1	1.66
3	Puerperal pyrexia	3	5
Fetal complications			
SL No	Nomenclature	Frequency (N =60)	Percentage (%)
1	Low Apgar Score	3	5
	Stillbirth	0	-
2	Meconium aspiration syndrome (MAS)	2	3.33
3	Birth asphyxia	1	1.66
4	Fetal growth restriction	2	3.33

## Discussion

Out of a total of 60 patients observed, majority 36(60%) belonged to age group 26-30 years. This was in comparison to Vardhan Shakti et al who observed majority of their patients 105 (40%) ageing 26-30 years, and Doshi Haresh et al where majority were in the age group of 21-30 years<sup>8,9</sup>.

Out of 60 patients observed, 45 (75%) observed patients were para 1, followed by 8 (13.33%) para 2 and 7 (11.67%) para 3 or more. In a study by Puja Puri et al the gravida ranged from gravid 2 to gravid 6 and the parity ranged from para 1 to para 3<sup>10</sup>. In another study by Rajita S Jani et al maximum number of patients 45 (90%) were para 1 and para 2, compared to just 5(10%) patient falling in higher parity<sup>11</sup>. We observed majority 27 (45%) women with 37<sup>+0</sup> - 37<sup>+6</sup> weeks POG, which was in concordance with a study conducted by Shah Jitesh Mafatlal et al<sup>12</sup>.

Forty one (68.33%) out of 60 had inter-delivery interval of 2-4yrs, whereas only 13.33% had an interval of less than 2 years. In a systematic review of 22 observational studies by Conde-Agudelo et al it was concluded that short intervals are associated with increased increase risk of uterine rupture in women for TOLAC<sup>13</sup>.

In our study we observed majority of women i.e. 4 /13 (30.76%) who had fetal distress /fetal heart rate abnormality as the indication for cesarean section followed by failure of induction of labour and non-progress of labour as equal contributor (23.08%). This was in accordance with Vardhan Shakti et al who conducted a study in which it was observed that fetal distress was observed in 99 (41.7%) as the major indication for previous cesarean section<sup>8</sup>. McMohan et al have reported vaginal delivery in 66% of those with dystocia, 84% of those with malpresentation

and 75% of those with fetal distress as indication of previous cesarean section<sup>14</sup>. Chhabra S et al studied 77% of women with fetal distress as the indication for previous cesarean section<sup>15</sup>.

In our study we observed that only 10 women had successful prior VBAC and 9 women in our study population had prior spontaneous vaginal delivery before cesarean. In a study by Malede Birara et al prior successful VBAC was found to be associated with successful VBAC<sup>16</sup>. In a study by Rahman R et al of the 100 patients 6 had previous spontaneous vaginal delivery and all 6 women had successful VBAC<sup>17</sup>.

The success rate of VBAC was significantly higher (88.89% against 62.50%) in cases with cervical dilatation of 4 cm and more as against less than 4 cm at the time of admission. Landon et al, Demianczuk et al and Pickhardt et al reported similar findings in their studies<sup>18-20</sup>. In the present study, the rate of successful TOLAC in cases with previous normal vaginal delivery was more than 88.89%. Landon et al, Kraiem et al, Whiteside DC et al, and Bedoya et al reported that a previous vaginal delivery was the greatest predictor for a successful VBAC<sup>18, 21-23</sup>.

According to RCOG the risk of rupture in attempting VBAC after a LSCS is 1 in 200 (0.5%)<sup>1</sup>. There was no maternal mortality in the present study. Neonatal morbidity in the form of a low Apgar score (<5) was observed in 5% babies. Among the rest 13 were born by emergency CS, following failed TOLAC. Three CS was performed for scar dehiscence; four were performed for fetal distress and rest for failed induction and non progression of labor. All the three 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.

There was no perinatal mortality in the present study. Phelan et al in his study of 1,796 cases, reported a perinatal mortality of 4.5/1,000 deliveries<sup>24</sup>. The average duration of hospital stay for VBAC was 2 days, and 3-4 days for cases requiring repeat CS. Benson et al 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<sup>25</sup>.

Planned VBAC is associated with an additional 10 per 10000 prospective risk of antepartum stillbirth beyond 39+0 weeks of gestation (recommended timing for ERCS delivery) while awaiting spontaneous labour<sup>1</sup>. The pathophysiology of the increased risk of stillbirth associated with VBAC is unexplained, but this increased risk is evident in women with previous caesarean delivery compared with no prior caesarean delivery despite correcting for gestation and other factors. In the NICHD study, planned VBAC is associated with a 4 per 10 000 risk of term perinatal death (i.e. intrapartum stillbirth or neonatal death), with around one-third (1.4 per 10 000 overall) of deaths due to uterine rupture<sup>3, 17</sup>. In contrast, ERCS is associated with a risk of delivery-related perinatal death of 1 per 10000 or less. There are no data reporting on long-term maternal or infant outcomes of planned VBAC versus ERCS cohort groups. There are considerable data to show that repeated ERCS is associated with an increased risk of placenta praevia, placenta accreta and surgical complications at the time of subsequent pregnancy and delivery, such as hysterectomy<sup>1</sup>.

A reasonable summary of the evidence is that planned VBAC exposes the woman to a very low (0.25%) additional risk for experiencing perinatal mortality or serious neonatal morbidity and an additional 1.5% risk of any significant morbidity compared with opting for ERCS from 39+0 weeks of gestation. Nevertheless, it may be helpful to emphasise to women that the absolute risk of delivery-related perinatal death associated with VBAC is extremely low (4 per 10000) and comparable to the risk for nulliparous women in labour<sup>26</sup>.

Cochrane reviews suggest that there are benefits and risks associated with planned ERCS and planned induction of labour in women with a prior caesarean delivery<sup>1</sup>. There is a paucity of randomised controlled trials that would provide the most reliable evidence and help women to make an informed choice<sup>3</sup>. The related evidence for the established care pathways is potentially biased, as it is drawn from nonrandomised studies. Hence, the results and conclusions should be interpreted with caution and the uncertainties should be discussed with women.

## Conclusion

TOLAC is acceptable to women with previous one CS. VBAC is a much safer alternative to conducting ERCS in a developing country like ours where despite regular efforts still couples opt for multiple children. The Outcome of TOLAC is not associated with increased morbidity and mortality to both mother and babies.

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