

# Induction of Preterm Vaginal Delivery at 20 to 28 Weeks Gestation in Previous One Lower Segment Caesarean Section by Foley Catheter

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**Abstract:** ***Objective:** The aim of the study to assess the maternal outcome and safety of induced preterm vaginal birth after a previous one lower segment caesarean delivery. **Methodology:** In this study, 50 women who had singleton pregnancies with a previous one term lower segment caesarean section, in whom induction of labour was required in between 20 to 28 wks of gestation, were included. All 50 women were induced by Intracervical foley catheter and then progression of labour was monitored. Cases were evaluated in terms of induction delivery interval, efficacy and safety. **Results:** In our study all women were delivered vaginally and hysterotomy was not required. The mean induction delivery interval in Foley catheter group was 20.18±3.34 hrs. There was no case of uterine rupture. **Conclusion:** Women with previous lower segment caesarean section in whom premature induction of labour is required for any reason can be done easily, safely and effectively by using intracervical foley catheter without maternal morbidity. It has short induction delivery interval, low complication, low cost. Hence, I suggest that every woman with previous one lower segment caesarean section who requires premature induction should go for trial of labour before repeat caesarean section.*

**Keywords:** Preterm, vaginal delivery, caesarean section, foley catheter.

## 1. Introduction

A woman with previous caesarean delivery have two choices to give birth again either by a scheduled caesarean delivery or birth vaginally (VBAC). A trial of labor after caesarean delivery (TOLAC) is the attempt to have a vaginal birth after caesarean delivery. The dictum, “once caesarean section always caesarean section” no longer holds true. Several studies suggest that in women with prior caesarean section for nonrecurring cause, a trial of labour is safer than elective repeat caesarean section. This tendency to resist caesarean section arose from the wish not to compromise a patient’s obstetric future<sup>1</sup>. There are some obstetric situations where induction of labour is required in previous one caesarean section such as 1). Intrauterine fetal death, 2). Anhydramnios, 3). Fetal congenital anomalies and 4). Preterm premature rupture of membranes.

To avoid hysterotomy and caesarean section and to maintain further better obstetrics outcome induction of premature labour may be required. In the absence of a ripe or a favourable cervix, a successful vaginal delivery is less likely. The cervix is considered to be unfavourable for full term vaginal delivery if the Bishop’s score is less than 6 but in cases where induction is required for above reasons, cervix is usually os closed and uneffaced. A common dilemma facing the obstetrician is the induction of labour in the presence of an unfavourable cervix.

Various techniques have been used to ripen the unfavourable cervices, which include pharmacological and non-

pharmacological (mechanical) methods. The pharmacological methods include prostaglandins (PGE<sub>1</sub>, PGE<sub>2</sub>), oxytocin, oestrogens, mifepristone, etc.<sup>2</sup> The non-pharmacological methods include a transcervical Foley catheter, bougies, hygroscopic laminaria tents and forewater amniotomy.<sup>3</sup> Such mechanical methods are advantageous in terms of their reversibility and the reduced expenditure<sup>4</sup>. With the induction of labour in a previous caesarean section, the uterine rupture can be a serious complication. So, adequate precaution should be taken in inducing labour in the women with a previous one caesarean section.

## 2. Material and Methods

This prospective study was conducted in the Department of Obstetrics & Gynaecology, SMS Medical College, Jaipur from March 2015 to October 2016. Fifty women who were admitted in labour room with a previous one term lower segment caesarean section, in whom induction of labour was required in between 20 to 28 wks of gestation, were selected for the study. Those who had singleton pregnancies with a previous one caesarean section were included.

Inclusion Criteria for this study were women with previous one lower segment caesarean section (LSCS) with 20 to 28 wks gestation of pregnancy with: - 1). intrauterine fetal death, 2). preterm premature rupture of membranes, 3). anhydramnios, 4). fetal congenital anomalies. Women with any other uterine scar and previous hysterotomy were excluded. A written informed consent was taken from all the cases included in the study. All women evaluated thoroughly

regarding complete history, parity, indication for previous LSCS, thorough clinical examination, per-abdominal examination, pelvic examination were done and all risk factors were evaluated. Intracervical Foley catheter No. 16 F method was used to ripen the cervix in all cases. Under aseptic conditions, with the patients lying in the lithotomy position, the cervix was assessed through per vaginal examination. A 16 French Foley catheter was inserted into the endocervical canal, beyond the internal os and the balloon was inflated with 30ml of sterile water.

The catheter was strapped to the thigh with gentle traction. Progression of labour was monitored at 6 hours intervals. The catheter was expelled spontaneously and it was checked whether the cervix became favourable or whether a spontaneous rupture of the membranes had occurred. The Artificial Rupture of the Membranes (ARM) was followed by the starting with an intravenous oxytocin infusion of 2.5 units of oxytocin in 500ml of 5% dextrose at 10 drops/minute. The dose was titrated till the desired uterine contractions were achieved.

All women were monitored for cervical ripening, induction delivery interval, mode of delivery (vaginal or hysterotomy) and maternal complications (uterine hypertonicity, uterine rupture and sepsis).

### 3. Results

In the study of 50 cases with gestational age of 20 to 28 wks with previous one lower segment caesarean section in whom induction of labour required induced by using intracervical foley catheter. Cases were evaluated regarding induction delivery interval, efficacy, and safety. Table no. 1 showing different characteristics of women in terms of maternal age, gravida, parity, gestational age. Various indications are there for preterm labour induction.

Gravidity also affects mean induction delivery interval. The mean interval of induction to delivery in 2<sup>nd</sup> gravida women was 21.84±2.56 hrs and in 3<sup>rd</sup> gravida women was 17.59±2.37 hrs. The mean interval of induction to delivery in 4<sup>th</sup> gravida women was 14.38±0.53 hrs. 3<sup>rd</sup> and 4<sup>th</sup> gravida women considered having one and two previous vaginal delivery respectively along with one lower segment caesarean section. Table no. 2 showing mean time interval from induction to ARM/Oxytocin and delivery interval by using using foley catheter. The mean time interval of induction to ARM/Oxytocin was 17.8±3.71hrs, this is the time when the cervix became favourable for the vaginal delivery and the mean induction to delivery interval was 20.18±3.34hrs.

**Table 1:** Characteristics of women

Parameters	Group A
Mean Age	24.72 ± 2.86 yrs
Mean gravid	2.40 ± 0.57
Mean parity	1.4 ± 0.57
Gestational Age	24.16 ± 2.61 wk
Indication of induction	
Intrauterine fetal death	17
Preterm premature rupture of membranes	15
Anhydramnios	4

Fetal congenital anomalies	14
<b>Gravida with induction delivery interval</b>	
G2	21.84 ± 2.56 hr
G3	17.59 ± 2.37 hr
G4	14.38 ± 0.53 hr

**Table 2:** Mean time interval (Hr)

	N	Mean time interval(hrs)
Induction to ARM/Oxytocin	50	17.8±3.714
Induction to delivery	50	20.18±3.3499

**Table 3:** Distribution of the cases according to induction delivery interval

Induction delivery interval (Hr)	No.	%
<24	42	84
≥24	8	16
Total	50	100

Table. 3 showing number of women delivered within 24 hrs was 42 (84%) and rest of 8 women delivered after 24 hrs. indicates significant no. of women delivered in short time. There was no case of uterine rupture, puerperal pyrexia, post partum haemorrhage, uterine hyperstimulation.

### 4. Discussion

The rate of caesarean deliveries has increased significantly in recent years, most of the increase being due to repeat caesarean sections. If we are to control this rapid rise in the caesarean section rate, it is especially important to try to give women with a previous caesarean section a trial of vaginal delivery. The unripe cervix is a major impediment to the success of labour induction and vaginal delivery<sup>5</sup>.

The goal of labour induction is to achieve vaginal delivery by ripening the cervix and stimulating uterine contractions before the spontaneous onset of labour. The mechanical methods stimulate the endogenous prostaglandin production, thus ripening the cervix<sup>4</sup>. Such mechanical methods are advantageous in terms of their reversibility and the reduced expenditure<sup>6</sup>. But Foley catheter has been linked with a possibility of infections in some larger studies. Thus, tremendous attention should be drawn towards carrying out aseptic measures while it is being inserted, to avoid maternal and probable neonatal infections<sup>7</sup>.

Induction of labour in previous one caesarean section offers distinct advantages over a repeat caesarean section since the operative morbidity and mortality are completely eliminated, the hospital stay is much shorter and expenses involved are much less. The rate of caesarean section needs to be reduced by resorting to a trial of vaginal delivery after previous caesarean section.

Compared with a planned caesarean delivery, a successful TOLAC is associated with the multiple benefits such as no abdominal surgery, shorter recovery period, lower risk of infection, less blood loss. If women desire to have more children, VBAC may help her to avoid problems linked to multiple caesarean deliveries. These problems include hysterectomy, bowel or bladder injury and certain problems with the placenta<sup>8</sup>.

In this study all 50 women with previous lower segment caesarean section on preterm induction delivered vaginally successfully, no women needed hysterotomy and there was no other complication. The mode of induction using foley catheter in women with previous one caesarean section are safe, simple and effective.

The objective of our study is- to assess the maternal outcome and safety of induced preterm vaginal birth after a previous one lower segment caesarean delivery. To assess the safety of preterm vaginal birth in previous one lower segment caesarean section and to reduce the risk of recurrent caesarean section and associated maternal morbidity.

The mean time interval of induction to ARM/Oxytocin or the time when the cervix became favourable for the vaginal delivery was 17.8±3.71hrs and the mean induction to delivery interval was 20.18±3.34hrs.

No. of women delivered within 24 hrs in group A was 84% (42 out of 50 women). By using foley catheter significant no. of women delivered within 24 hrs. It always creates a big mental trauma to the women and her family members, as they come to know the bad status of their baby in utero and requirement of preterm delivery. In this condition, after taking decision, they want to deliver the baby as earliest without increasing mother's morbidity.

In similar study done by Farah Ziyauddin et al<sup>9</sup> in seventy women with singleton pregnancies at term, with previous one lower segment caesarean sections by using foley catheter and prostaglandin E<sub>2</sub> gel concluded that foley catheter induces a significant ripening and dilatation of the cervix and a short induction to the delivery interval with advantages of low cost, reversibility and the low risk of systemic and serious side effects like uterine hyperstimulation and rupture.

Women with one or more previous vaginal delivery, particularly previous VBAC, is the single best predictor of successful VBAC and is associated with a planned VBAC success rate of 85–90%. Previous vaginal delivery is also independently associated with a reduced risk of uterine rupture. [C]<sup>10</sup>

With the induction of labour in a previous caesarean section, the uterine rupture can be a serious complication. There was no case of uterine rupture, puerperal pyrexia, post partum haemorrhage, uterine hyperstimulation or any other complication.

Planned preterm VBAC has similar success rates to planned term VBAC but with a lower risk of uterine rupture. [B]<sup>10</sup> Induction of labour using mechanical methods (amniotomy or Foley catheter) is associated with a lower risk of scar rupture compared with induction using prostaglandins. [D]<sup>10</sup> The induction by using Foley catheter mimick the physiology of the labour onset more closely, resulting in a less likelihood of hyperstimulation and postpartum haemorrhage as compare to prostaglandin E<sub>2</sub> gel<sup>9</sup>.

Samia Khotaba et al<sup>11</sup> carried out Induction of labor in 37 women with previous caesarean section using the Atad double balloon device (ARD). Vaginal delivery achieved in

78.6% and repeat caesarean section in 22.3%. No complications were noted using the device. They concluded that *the* double balloon device appears to be a safe and effective method of inducing labor in women with a previous lower segment caesarean section.

Marta Jozwiak et al<sup>12</sup> studied induction of labour with a Foley catheter in 208 women with an unfavorable cervix and a history of one CS. Of the women 60% had a spontaneous vaginal delivery and 11% were delivered by vacuum extraction. Concluded that, Induction of labor with a transcervical Foley catheter is an effective method to achieve vaginal delivery in women with a previous caesarean delivery. There is a low risk of uterine rupture and maternal and neonatal (infectious) morbidity in this cohort.

Eran Ashwal et al<sup>13</sup> studied pregnancy outcome of women with prior single low transverse CS who underwent labor induction (study group) was compared to women with prior single low transverse CS who admitted with spontaneous onset of labor during the same period (control group). No difference was found in the rate of uterine rupture/dehiscence. Concluded that induction of labour in women with one previous lower segment CS neither increases the risk of uterine rupture nor adversely affects immediate neonatal outcome.

## 5. Conclusion

To conclude, I would like to say that women with previous lower segment caesarean section in whom premature induction of labour is required for any reason can be done easily, safely and effectively by using intracervical Foley catheter without maternal morbidity. It has short induction delivery interval, low complication, low cost. Better result is seen in women who have had a vaginal delivery along with one previous lower segment caesarean section. Hence, I suggest that every woman with previous one lower segment caesarean section who requires premature induction should go for trial of labour before repeat caesarean section.

## 6. Disclosure

Authors report no conflicts of interest in this work

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