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Evaluating trial of scar in patients with a history of caesarean section

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Abstract

Aims: To analyze the outcome of trial of scar in patients with previous caesarean section and to assess the fetal and maternal complications after trial of scar. **Patients and Methods**: The study was conducted at Military Hospital, Rawalpindi, Pakistan, with 375 pregnant patients who had a previous delivery by caesarean and who had regular antenatal checkup. Data were recorded on special pro-forms designed for the purpose. **Results**: The results from the 375 patients who had one previous lower segment caesarean section due to non-recurrent causes were analyzed and compared with national and international studies. Indications of previous caesarean section (non-recurrent causes) included malpresentations, fetal distress/cord prolapse, failure to progress, severe pregnancy-induced hypertension/eclampsia and twins with abnormal lie of the first twin. 218 patients reported spontaneous labor. Among these patients, 176 delivered vaginally and 42 patients had repeat caesarean sections. There were A total of 157 patients who experienced induction of labor. 97 patients were induced by cervical ripening with mechanical method, followed by artificial rupture of membranes and augmentation (if required) with syntocinon infusion. 60 patients were induced with prostaglandin E_2 vaginal tablet. **Conclusion**: This study concludes that females with a prior caesarean are at increased risk for subsequent caesareans, regardless of mode of delivery. Eliminating vaginal-birth-after-caesarean will not eliminate the risk. Therefore, vaginal birth after caesarean should be encouraged in selected cases from obstetric units to reduce the risks of repeated caesarean sections. Failed vaginal-birth-after-caesarean can result in increased morbidity than that with elective caesarean section.

Keywords: Caesarean section, vaginal birth after caesarean section (VBAC), trial of labor.

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Introduction

In the first half of the 20th century, if patients had one caesarean section, then subsequent pregnancies were likely to be delivered in the same way. However, current medical evidence indicates that 60%-80% of women can achieve vaginal delivery after a previous lower uterine segment caesarean delivery. Patients who attempt a VBAC (vaginal birth after caesarean) but fail and require an emergency repeat caesarean section have the greatest morbidity. Uterine rupture is the most catastrophic complication of a trial of labor (TOL) after previous caesarean delivery. In such cases, prompt intervention is necessary to minimize both maternal and neonatal complications. Other complications include scar dehiscence, febrile illness, infections, thromboembolic events and bleeding due to morbidly adherent placenta. For women with a prior uterine scar, repeat elective caesarean birth or TOL for vaginal birth after caesarean birth (VBAC) are risk-free. When successful, VBAC-TOL is associated with less morbidity than repeat caesarean birth. However, when VBAC-TOL fails due to uterine rupture, severe consequences ensue. The challenge for clinicians is to provide women who desire TOL after caesarean birth with a more individualized risk assessment of uterine rupture, thereby enhancing success and optimizing the outcome.

The incidence of uterine rupture with VBAC in a mother who has had a low transverse incision is approximately

0.2%–0.5%. Accompanying the elevated risk of uterine rupture is an increased risk for hysterectomy. There is no conclusive evidence that labor induced with prostaglandin gel creates a risk in VBAC.

Patients and Methods

This study was conducted at Military Hospital, Rawalpindi, Pakistan, with 375 pregnant patients who have had one previous lower segment caesarean section (LSCS) done for a non-recurrent cause and who also had regular antenatal checkups (Table 1). Data were recorded on special pro-forms designed for the purpose.

Patients were excluded who had previous classic caesarean sections, more than one caesarean section, breech/transverse lie in current pregnancy, diabetic macrosomic baby in current pregnancy or any contraindication to vaginal delivery in current pregnancy, such as placenta previa or fetal compromise (Tables 2 & 3). Patients who had previous LSCS for recurrent causes, such as cephalopelvic disproportion (CPD), were also excluded.

For the patients selected for the study, a decision was made at 37 weeks of gestation regarding the trial of scar after ascertaining the pelvic adequacy and suitability of other factors. Spontaneous labor (in the absence of any complication indicating early induction of labor) was awaited until the end of the 41st week. After this time, induction of labor was performed and the mode of delivery and fetal and maternal complications were recorded. Maternal complications included uterine rupture/scar dehiscence, postpartum hemorrhage, febrile morbidity, wound sepsis, thromboembolic events and other infections. Fetal complications included meconium stained liquor, low Apgar score < 6 at 5 minutes and intrapartum death.

Statistics Study

The data were presented as proportions expressed as percentages. Software version 10.00 (SPSS) was used to analyze the descriptive aspects of the data.

Results

In this study, patients were not allowed beyond the 41st week. Only 218 patients reported spontaneous labor. Among these patients, 176 delivered vaginally and 42 patients had repeat caesarean sections (Tables 4 & 5). There were a total 157 patients who experienced induction of labor. Ninety seven (97) patients were induced by cervical ripening with mechanical method followed by acceleration (if required) with syntocinon infusion. Fifty patients were induced with prostaglandin E_2 vaginal tablet. In the first group, 65 out of 107 patients delivered vaginally and 42 patients delivered by LSCS. In the second group of 50 patients who were induced with prostaglandin E_2 vaginal tablet, 30 were delivered vaginally and 20 were delivered by LSCS (Tables 6 &7).

Table 1 Indications of previous caesarean for a non-recurrent cause (n = 375)

Indication	Number	Percentage
Malpresentation	28	7.00
Fetal distress/cords prolapse	77	20.5
Failure to progress	81	22.00
Antepartum hemorrhage	37	10.00
Severe PIH/eclampsia	139	37.00
Twins	13	3.5
Total	375	100.00

Table 2 Pattern of labor in patients with previous caesarean section (n = 375)

Onset of Labor	Case No.	Vaginal delivery	LSC/section after failed trial of labor
Spontaneous	218	176	42
Induction	157		
Cervical ripening with intra-cervical Foley's catheter followed by syntocinon infusion	107	65	42
Prostaglandin E_2 vaginal tablet	50		
Cytotac	Nil	30	20
		-	-

Table 3 Outcome of trial of vaginal delivery following previous lower segment caesarean section (n = 375)

Mode delivery	Number	Percentage
Normal vaginal delivery	199	53.0%
Instrumental delivery	62	17.0%
Emergency caesarean section	114	30.0%
Total	375	100.0

Table 4 Type of vaginal delivery (n = 261)

Type of delivery	Number	Percentage
Normal vaginal delivery	199	76.0
Ventouse delivery	47	18.0
Outlet forceps	15	6.0
Total	261	100.00

Table 5 Indications for emergency lower segment caesarean section after failed trial of scar (n = 114)

Type of delivery	Number	Percentage
Failed progress of labor in first stage	63	55.5
Fetal distress	48	42.0
Scar tenderness or dehiscence of scar	03	2,5
Total	114	100.00

Table 6 Maternal complications during vaginal delivery (n =261)

Complications	Number	Percentage
Primary postpartum hemorrhage	7	2.5
Blood transfusion	4	1.5
Febrile morbidity	11	4.0
Uterine rupture/scar dehiscence	-	-
Episiotomy wound sepsis	-	-
Thromboembolic event	-	-
No complications	239	92.0
Total	261	100.00

Table 7 Maternal complications during emergency caesarean section (n = 114)

Complications	Number	Percentage
Blood transfusion	19	17.0
Wound sepsis	5	4.0
Uterine rupture/scar dehiscence	1	0.8
Primary postpartum hemorrhage	9	8.0
Febrile morbidity/other infections	2	1.2
Thromboembolic event	-	-
No complications	79	69.0
Total	114	100.00

Table 8 Fetal complication during normal vaginal delivery (n = 261)

Complications	Number	Percentage
Meconium aspiration	23	9.0
Low Apgar score < 6 at 5 min.	9	3.5
No complication	229	87.5
Total	261	100.00

Table 9 Fetal complication during emergency caesarean section (n = 114)

Complications	Number	Percentage
Meconium aspiration	29	25.5
Low Apgar score < 6 at 5 min.	8	7.0
No complications	77	67.5
Total	114	100.00

Discussion

The American College of Obstetricians and Gynecologists (ACOG) updated their guidelines concerning vaginal delivery after previous caesarean section. The ACOG Committee on Obstetrics: Maternal and Fetal Medicine stated; "the concept of routine repeat caesarean birth should be replaced by a specific indication for a subsequent abdominal delivery and in the absence of a contraindication, a woman with one previous caesarean delivery with a low transverse incision should be counseled and encouraged to attempt labor in her current pregnancy" [1]. Enthusiasm for vaginal birth after caesarean section has waned. As a result, the caesarean birth rate is again on the rise. There is now a large obstetric population with caesarean sections and most of these have been done for non-recurrent conditions. In developing countries such as Pakistan, the parity is high and restriction of family size is not generally accepted due to social, religious or psychological beliefs. Therefore, in Pakistan, the overall rate of caesarean section should be reduced by a sound indication for the first caesarean section and then encouragement for vaginal birth after a caesarean section to reduce operative morbidity and mortality.

Current obstetric opinion is that the lower segment caesarean section is not a contraindication for the use of oxytocin for induction and augmentation of labor, however, the role of prostaglandin is controversial. To determine the impact of labor induction on both the success and safety of a trial of labor in women who were candidates for VBAC, a prospective observational analytical study was conducted at the Medical University of South Carolina. The vaginal delivery rate was significantly higher (77.1% vs. 57.9%) in the spontaneous labor group compared with the induced labor group. Uterine scar separation occurred more frequently in the induced labor group (7%) than in elective repeat caesarean group (1.5%). The study concluded that induction of labor in women attempting vaginal birth after caesarean is associated with a significantly reduced rate of successful vaginal delivery and an increased risk of serious maternal morbidity [2].

The risk of major maternal complications has been reported to be almost twice as likely in women who underwent a trial of labor than in women who chose an elective repeat caesarean section. Rageth et al disclosed an elevated risk of uterine rupture in patients who had a history of caesarean delivery and were undergoing a trial of labor versus elective repeat caesarean [3]. In the literature to date, the overall risk of uterine rupture for women undergoing a trial of labor after caesarean delivery has been reported to be between 0.2% and 0.1%. Naef et al retrospectively reviewed the delivery outcomes of 262 women with lower vertical uterine incisions over a 10-year period. Fifty-four percent experienced a trial of labor with 83% having a successful vaginal delivery rate. The uterine rupture rate was 1.1% (2/174) in the trial of labor group versus nil in the elective repeat caesarean group. No serious adverse sequelae were observed following uterine rupture [4].

In 2001, Lydon-Rochelle et al demonstrated a 3-fold increase in the risk for uterine rupture when comparing patients induced with prostaglandins to those induced with oxytocin [5]. Stone et al studied 89 women with one previous caesarean section using 2 mg intracervical prostaglandin E_2 gel and reported a 66% vaginal delivery rate and a 2% uterine scar dehiscence rate (all asymptomatic) [6]. Del Valle et al in a retrospective series also did not report any major maternal or perinatal complication [7]. Norman and Ekman applied 0.5 mg prostaglandin E_2gel intracervically, achieving a 63% vaginal delivery rate with no cases of uterine rupture [8]. Use of prostaglandin for women with one previous caesarean section is controversial; concern has been expressed regarding the safety of these agents in a scarred uterus for fear of increased risk of uterine rupture. Several small series have been published investigating prostaglandin E_2 (administered either vaginally or intracervically) for cervical ripening in women with prior caesarean section. Blanco et al assessed 25 women with low Bishop scores who received 1mg of prostaglandin E_2 gel intracervically. The vaginal delivery rate was 72% and no major complications were reported [9]. In 1998, Wing et al reported a case study of 17 patients who were induced with misoprostol, in which 2 uterine ruptures occurred. These findings have led to the decreased use of prostaglandins for induction, particularly misoprostol [10]. Recent reports on the use of misoprostol (Cytotec) in patients with a uterine scar suggest that there may be a much greater risk associated with induction in these women than has been previously observed. The study performed by

Rageth et al [3] noted that complications, namely maternal febrile episodes, thromboembolic events, bleeding due to placenta previa, uterine rupture and perinatal mortality, were significantly frequent in the previous caesarean group. The post-caesarean group also showed a 0.28% rate of peripartum hysterectomy.

Although the rates of uterine rupture and neonatal asphyxia were slightly higher in women who attempted a VBAC than in women who underwent an elective caesarean section, obstetricians should offer the option of a trial of labor since more than one-half of the women with a previous caesarean delivery might have successful vaginal deliveries. In addition, the VBAC-related maternal mortality rate does not reportedly differ between women undergoing a trial of labor and women undergoing an elective repeat caesarean section [11].

A study was conducted by Hibbard et al that showed blood loss was lower and chorioamnionitis was higher in women who attempted vaginal births after caesarean. Patients who experience failed vaginal birth after caesarean have higher risks of uterine disruption and infectious morbidity compared with patients who have successful vaginal births after caesarean or elective repeat caesarean delivery [12]. A study was conducted by Hibbard et al to determine the maternal risks associated with failed attempt at vaginal birth after caesarean compared with elective repeat caesarean delivery or successful vaginal birth after caesarean. It suggests that patients who experience failed vaginal birth after caesarean delivery have higher risks of uterine disruption and infectious morbidity compared with patients who have successful vaginal birth after caesarean or elective repeat caesarean delivery [12]. There is an increased risk of uterine rupture in patients who have an excessive amount of oxytocin, who experience dysfunctional labor and who have a history of two or more caesarean deliveries. Hence, all patients with a history of caesarean delivery should be observed closely for progression of labor. If an active phase arrest disorder is recognized despite adequate augmentation with oxytocin, operative delivery is required. The dehiscence rate of a lower segment transverse uterine scar is 2% to 4%, but a vertical scar is much higher. Therefore, the strongest predictor of the safety of labor after previous caesarean is the location of the previous uterine scar. Neonatal outcomes of elective caesarean delivery were at increased risk of developing respiratory problems [13].

The results also predict that complications following successful vaginal delivery were much less than emergency caesarean sections. Only 1 case of scar dehiscence was reported, which was in the group of emergency LSCS. The overall rate of blood transfusions was higher in both groups, as Pakistani women were more likely both multiparous and malnourished. The rate of blood transfusions was highest in the group who had emergency caesarean section. This higher rate of transfusion can be due to added effect of blood loss during emergency surgery. Similarly, wound sepsis and febrile morbidity were higher in the emergency LSCS group, and again this may be due to poor health or complication of emergency surgery. After reviewing the health status and parity of these women, VBAC should be encouraged with strict feto-maternal monitoring during labor in hospitals. As in underdeveloped countries, the non-availability of modern neonatology equipment leads to a higher rate of complication in neonates. In the current study, the fetal complication rate during vaginal delivery was 12.5 %, while fetal complications after failed trial of scar were 32.5%.

It is obvious that trial of scar after previous caesarean delivery is safe for patients who are managed in tertiary care centers and in those hospitals where intensive surveillance, expertise and facilities for emergency caesarean section and exploratory laparotomies are available. There is no role for unsupervised deliveries or home deliveries in a trial of scar. Moreover, successful VBAC has less maternal and fetal complications as compared to the emergency/repeat caesarean section group. Therefore, vaginal birth after caesarean in modern obstetrics is very sound and should be encouraged.

Conclusion

The current study concludes that women with a prior caesarean are at increased risk for repeat caesareans, regardless of mode of delivery; eliminating VBAC will not eliminate the risk. Vigilance with respect to indication at primary caesarean delivery, proper counseling for trial of scar and evaluation of patients with prior caesarean section are key to reducing the caesarean section rate. There is no doubt that a trial of labor is a relatively safe procedure, but it is not risk free (Tables 8 & 9). Therefore, patient evaluation prior to trial of scar, careful observation throughout labor in a well-equipped unit with around the clock services for emergency surgery and availability of expertise is the backbone for successful trial of scar. Higher morbidity and costs of repeat lower segment caesarean sections outweigh the advantages. The results of the present study show that VBAC should be encouraged in all well-established obstetrics units.

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