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A study of risk factors for scar dehiscence in previous caesarean delivery

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Abstract
Aim: The aim of this study is to determine the risk factors for uterine scar dehiscence among women undergoing repeat cesarean delivery.
Methodology: This is a prospective observational study conducted at ESIC - Medical College & PGIMSR, Rajajinagar, Bangalore from January 2015 to June 2017. 100 women who underwent repeat LSCS and uterine scar dehiscence recorded by the operating surgeon were eligible. Data was collected regarding maternal age, obstetrical history, associated risk factors and outcome.
Results: 100 women with Uterine Scar Dehiscence were studied and risk factors determined. Inter-delivery interval <24 months was observed in 23%, associated with pre-term delivery in 31%.
Conclusion: Uterine scar dehiscence is not uncommon among women undergoing elective repeat cesarean delivery. It is a clinically occult benign condition identified incidentally at repeat caesarean delivery and is not associated with any adverse maternal or perinatal outcome compared to uterine rupture which is associated with significant morbidity. However, it was significantly associated with NICU admissions and neonatal low birth weight. This could be explained by the fact that more premature infants were found to belong to uterine scar dehiscence group. Therefore it is important to prevent risk factors like pre-term delivery, prevent anemia and treat infections like UTI in women with previous caesarean delivery to reduce the incidence of Uterine Scar Dehiscence.

Keywords: previous LSCS, scar dehiscence, pre-term, anemia, elective caesarean delivery

Introduction

Caesarean section is the most common major surgical obstetric intervention. Eighty to ninety percent of women with previous caesarean section are delivered by elective repeat caesarean delivery in subsequent pregnancy [1, 2].

Previous Caesarean Delivery is the most important risk factor for both uterine scar rupture and dehiscence; hence, it is not surprising to witness a surge of both conditions that paralleled the recent increase in cesarean section rates [3].

Uterine rupture typically is classified as either (1) *complete* when all layers of the uterine wall are separated, or (2) *incomplete* when the uterine muscle is separated but the visceral peritoneum is intact. Incomplete rupture is also commonly referred to as *uterine dehiscence*.

A uterine rupture is a life-threatening event for mother and baby. A uterine rupture typically occurs during active labor, but may already develop during late pregnancy. Uterine dehiscence is a similar condition, but involves fewer layers, less bleeding, and less risk.

Uterine Scar Dehiscence generally refers to an incomplete uterine scar disruption where the serosa remains intact and the fetus, placenta and umbilical cord remain contained within the uterine cavity [4]. Usually it is a clinically occult benign condition Identified accidentally at repeat caesarean delivery.

The incidence of cesarean section scar defect reportedly ranges between 6.6 % to 69 % with variations mainly due to absence of criteria for the Caesarean Scar Dehiscence [5, 6]. Compared to complete uterine rupture, uterine dehiscence has much lower maternal and neonatal morbidity. The cause for a uterine scar dehiscence is based on the etiology behind the uterine scar defect or any event that would predispose the cesarean scar to dehisce. Underlying anatomical defects in the uterus which would have been corrected prior to pregnancy like uterine septum or fibroid uterus may weaken the uterus and the resultant scar of the cesarean section.

Generally the uterine dehiscence appears to be clinically occult and is not associated with any adverse maternal or perinatal outcomes. However, it was significantly associated with NICU admissions and neonatal low birth weight. This could be explained by the fact that more premature infants were found to belong to uterine scar dehiscence group.

This study was designed to explore the incidence of Uterine Scar Dehiscence and to investigate the risk factors associated with this condition in our obstetric population.

Materials and methods

This is a prospective observational study conducted in the department of Obstetrics and Gynecology at ESIC - Medical College & PGIMSR, Rajajinagar, Bangalore. A total of 100 cases of uterine scar dehiscence from January 2015 to June 2017 were included in this study to find out the predisposing risk factors. Women who underwent repeat caesarean delivery with uterine scar dehiscence found incidentally on table were studied. The studied variables included maternal characteristics like age, parity and presence of any medical co-morbidities; obstetrical history like previous preterm birth, gestational age, order of Caesarean Delivery, inter-delivery interval, twin gestation, presence or absence of labor at the time of Caesarean Delivery (documented on routine pre-operative cardiotocogram), pain at the site of cesarean scar and technique of previous LSCS closure (single versus double layer closure).

Inclusion criteria

Women with previous caesarean delivery undergoing elective or emergency cesarean delivery were eligible for the study.

Statistical analysis of data was carried out using SPSS statistical software. Quantative data were analysed with mean, median and standard deviation. Qualitative data (categorical) were analysed with percentages and frequencies. The significance in difference between the two groups were assessed with cross tables, Pearson's chi square test and Fishers exact test were applied where ever necessary

Results

Table 1: Age

Age	No. of cases
<20	1
20-25	38
26-29	34
30-34	24
>35	3

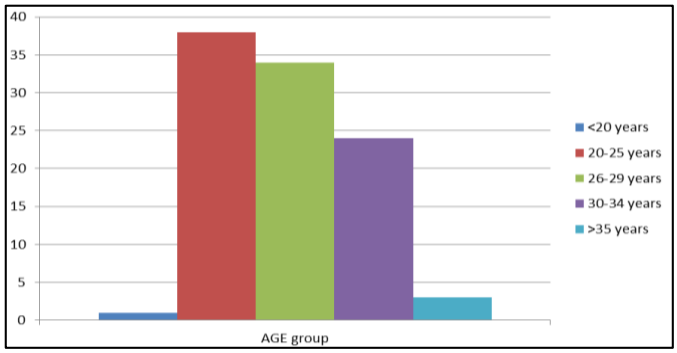

Fig 1

In the age groups, maximum uterine scar dehiscence were noted in age group of 20-25 years (38%) and 26-30 years (34%) and the number of pregnancies are also seen more in these age groups. however significant number of uterine scar dehiscence were noted in age group 31-35 years (24%)

Table 2: Period of gestation

Period of Gestation	No. of cases
<37 weeks	31
37-40 weeks	67
>41 weeks	2

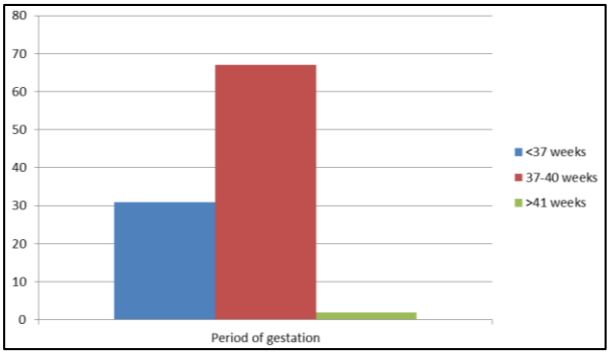

Fig 2

The rate of Uterine scar dehiscence was found to be associated with increased pre-term delivery, around 31% in our study. This leaded to increased neonatal pre-term delivery, low birth weight (19%) and NICU admissions. Ramadan MK *et al.* found 33% association of uterine scar dehiscence and pre-term delivery [7]. Other studies also reported similar finding. Bashiri *et al.* found that preterm delivery is an independent risk factor of uterine scar dehiscence [4]. They suggested an association between preterm delivery and uterine infection/inflammation that may have simultaneously led to weakness of the uterine scar.

Table 3

CO-Morbidities	No of cases
Pih	12
GDM	10
Hypothyroid	22
Anemia	15
Infections (UTI, Bacterial vaginosis)	15
Polyhydramnios	2
Oligohydramnios	6
PROM	11
Nil	39

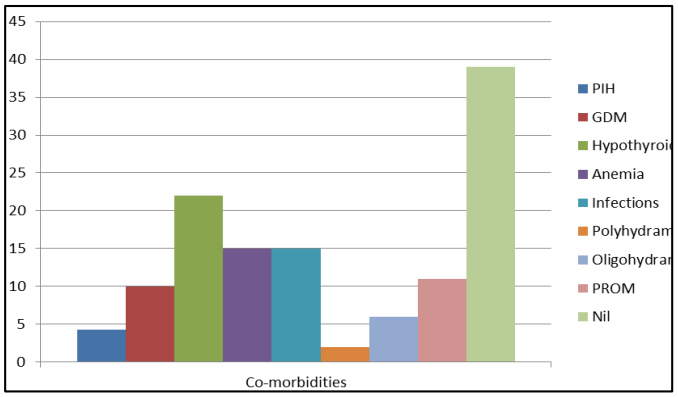

Fig 3

Table 4

Current pregnancy	No. of cases
1 prev LSCS	91
2 prev LSCS	9
≥3prev LSCS	0

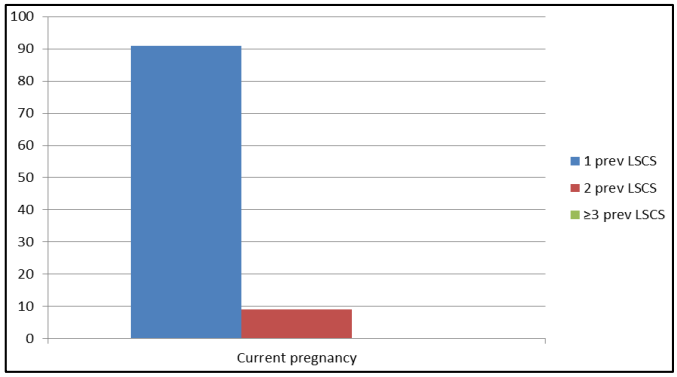

Fig 4

Table 5

Inter-Delivery Interval	No. of cases
<2 years	23
>2 years	77

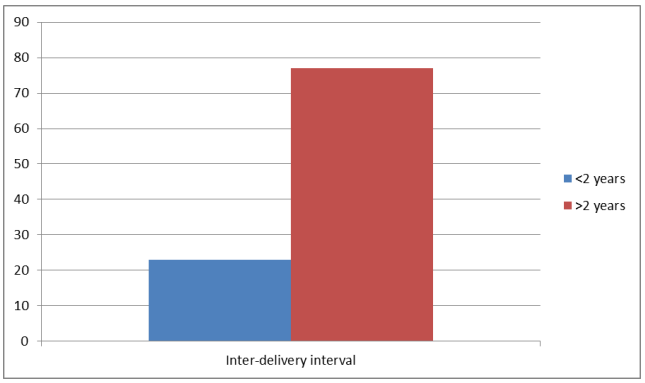

Fig 5

Another important risk factor noted was inter-delivery interval <24 months in 23%. This might be due to heavy weight lifting, sexual contact, infections (15%) peri or postpartum (6 weeks) in first cesarean delivery include chorioamnionitis, postpartum infection including wound infection, urinary tract infection, endometritis, or infection of unknown origin, history of fever in puerperium. Bujold *et al.* reported that 10.5% of dehiscence occurred in patients with inter-delivery interval of less than 24 months compared to 3% after 24 months.[8] This finding may be related to the time needed for proper scar healing. Using magnetic resonance imaging, Dicle *et al.* showed that uterine scars needed at least 6 months to reach a normal appearance.[9]

Table 7

In labour	No. of cases
YES	69
NO	31

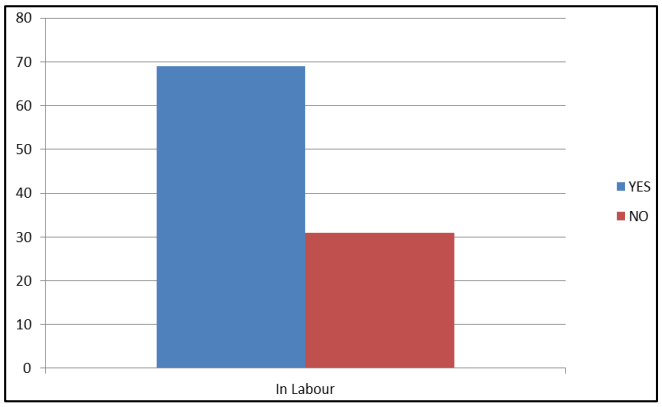

Fig 6

Table 8

Birth weight	No. of cases
>2.5kg	81
<2.5kg	19

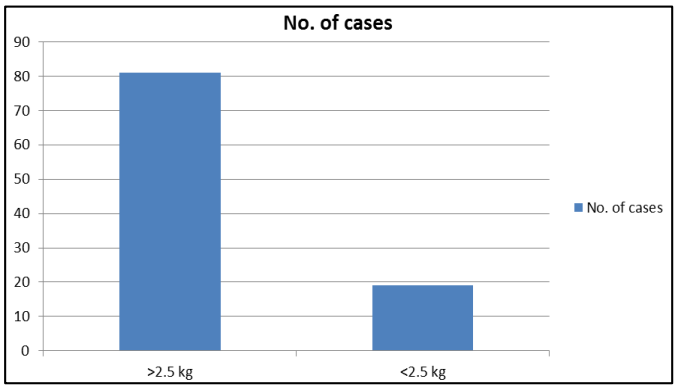

Fig 7

Discussion

The caesarean delivery rate is increasing worldwide. Several studies have shown that one caesarean section implies a high risk for caesarean section in the next pregnancy, confirming the age old dictum proposed by Edward Craigin in 1914 "Once a cesarean always a cesarean. Caesarean section, especially repeat caesarean section, is associated with an increased risk for uterine rupture, abnormal placental implantation, placental abruption and uterine scar dehiscence in subsequent pregnancies [10].

Cesarean delivery is defined as the delivery of a fetus through surgical incisions made through the abdominal wall and the intact uterus. Currently 18.6% of all births occur by Cesarean Section, ranging from 6% to 27.2% in the least and most developed regions, respectively [11]. One of the most common indication for cesarean delivery is Prior cesarean delivery. One notable complication of c-section is uterine scar dehiscence (USD), in which scar tissue remaining from a previous c-section is disrupted and separates. Although USD has not been precisely defined, the reported incidence of this condition ranges between 0.2% and 4.3% of all pregnancies associated with a previous c-section [12]. The major complication of USD is uterine rupture, which is reported in approximately 1 in 16,000–19,000 women without a history of previous uterine surgery [13].

Uterine Scar Dehiscence generally refers to an incomplete uterine scar disruption where the serosa remains intact and the fetus, placenta and umbilical cord remain contained within the uterine cavity [4]. Usually it is a clinically occult benign condition identified accidentally at elective repeat caesarean delivery.

Compared to complete uterine rupture, uterine dehiscence has much lower maternal and neonatal morbidity. The cause for a uterine scar dehiscence is based on the etiology behind the uterine scar defect or any event that would predispose the cesarean scar to dehisce. Underlying anatomical defects in the uterus which would have been corrected prior to pregnancy like uterine septum or fibroid uterus may weaken the uterus and the resultant scar of the cesarean section Factors which predispose to scar dehiscence in pregnancies after previous caesarean section are:

- Type of caesarean - The incidence of uterine rupture after a lower segment transverse caesarean section is about 1%, low vertical scar 1-7% and following a J, inverted T incision or previous classical caesarean is 4-9% [14].
- Number of previous caesarean sections - Risk of uterine rupture increases with the number of previous caesarean sections. Overall reported rate of uterine rupture after one caesarean is 0.7-0.9% and 0.9-1.8% after two or more caesarean sections [15].
- Short inter-delivery interval between the caesarean section and the subsequent pregnancy increases the incidence of scar dehiscence and rupture. The rate of rupture increases from 1.3-4.8% when the inter-delivery interval is more than 24 months and less than 18 months, respectively [16].
- Induction of labor with oxytocins and prostaglandins also increases the risk compared to women labouring spontaneously [17].

Other factors - History of fever in puerperium or woud infection following caesarean. Instrumental delivery, placental implantation over scar, and multiple pregnancy are factors in the current pregnancy which raise the risk of rupture.

The rate of Uterine scar dehiscence was found to be associated with increased pre-term delivery, around 31% in our study. This leaded to increased neonatal pre-term delivery, low birth weight (19%) and NICU admissions. Ramadan MK *et al.* found 33% association of uterine scar dehiscence and pre-term delivery. Other studies also reported similar finding. Bashiri *et al.* found that preterm delivery is an independent risk factor of uterine scar dehiscence [4]. They suggested an association between preterm delivery and uterine infection/inflammation that may have simultaneously led to weakness of the uterine scar.

Another important risk factor noted was inter-delivery interval <24 months in 23%. This might be due to heavy weight lifting, sexual contact, infections (15%) peri or postpartum (6 weeks) in first cesarean delivery include chorioamnionitis, postpartum infection including wound infection, urinary tract infection, endometritis, or infection of unknown origin, history of fever in puerperium. Bujold *et al.* reported that 10.5% of dehiscence occurred in patients with inter-delivery interval of less than 24 months compared to 3% after 24 months. This finding may be related to the time needed for proper scar healing. Using magnetic resonance imaging, Dicle *et al.* showed that uterine scars needed at least 6 months to reach a normal appearance.

Anemia was also found to be a risk factor leading to uterine scar dehiscence (15%), this might be due to poor previous scar healing, short inter-delivery interval, puerperial infections.

in the age groups, maximum uterine scar dehiscence were noted in age group of 20-25 years (38%) and 26-30 years (34%) and the number of pregnancies are also seen more in these age groups. however significant number of uterine scar dehiscence were noted in age group 31-35 years (24%).

Roberge *et al.* in their study found out that there was no impact of single or double layer closure of low transverse caesarean section on uterine scar dehiscence [18]. Similar was concluded in our study, however single-layer closure of caesarean incision is a well-known risk factor for uterine scar dehiscence in women undergoing TOLAC.

Conclusion

Uterine scar dehiscence is identified incidentally at repeat caesarean delivery However, it is significantly associated with NICU admissions and neonatal low birth weight. It is important to identify and prevent the risk factors to reduce the incidence of Uterine Scar Dehiscence.

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