

Association Between Ultrasonographically Measured Lower Uterine Segment Scar Thickness and Obstetric Outcome in Women with Previous Caesarean

Ultrasonographically Measured Lower Uterine Scar and Obstetric Outcome with Previous C Section

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ABSTRACT

Objective: To assess the association between ultrasonographically measured lower uterine segment scar thickness and obstetric outcome in women with previous one caesarean section.

Study Design: A prospective observational study

Place and Duration of Study: This study was conducted at the department of obstetrics and gynecology, Lady Reading Hospital, Peshawar, from June 2021 to December 2021.

Materials and Methods: On a well-organized proforma, we entered all the important data. To measure the thickness of the lower uterine segment scar (LUS), trans-abdominal sonography was performed for all the enrolled women. For data analysis, data were input into SPSS version 20.

Results: In the current study, totally 120 participants were enrolled. Based on Scar Thickness, 24 (20%) patients had Scar Thickness of 2.5-3mm, 12 (10%) had 3.1-5mm scar thickness whereas 84 (70%) patients had scar thickness of >5mm. Based on the association between the lower uterine segment scar thickness and mode of delivery, significant association was observed ($p=0.001$). Significant association was observed between the scar status at the time of delivery and LUS thickness ($p=0.001$).

Conclusion: According to the findings of our research, prenatal evaluation of the lower uterine segment in women who have had prior cesarean sections is a valid technique for selecting women who should be given a chance to try labor. Our research has shown that a LUS thickness of 3.1-5mm at 38-40 weeks of gestation is linked to a higher likelihood of a successful VBAC.

Key Words: Ultrasonography; Lower uterine segment scar; Obstetric outcome; Women

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INTRODUCTION

Both emerging and developed nations have observed an increase in the global Caesarean Section Rate (CSR). The CSR is higher than the WHO-suggested safe range of 10 to 15% of the total number of births in a nation, according to the most recent National Family Health Survey, which found that it is as high as 87.1% in certain locations and has been increasing annually by 16.7%.^{1,2}

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There are thus more pregnancies among women who have scars on their uterus. Long-standing debates have surrounded the management of women who have had prior cesarean sections³ The "National Institute for Health Care and Excellence (NICE), the Royal College of Obstetricians and Gynecologists (RCOG), and the American College of Obstetricians and Gynecologists (ACOG)" all agree that planned VBAC is a safer option for most women who have had a single lower segment caesarean delivery in the past^{4,5} VBAC has been promoted as a strategy to save healthcare costs by lowering the prevalence of caesarean births. A trial of labour (TOLAC) is more economical than an intentional repeat caesarean birth for women who have had a single lower segment caesarean section (LSCS) in the past⁶ According to individual research, following a single prior caesarean, planned VBACs have attained success rates of 72 to 76%.⁵

In contrast, previous caesarean section has been identified as the most prevalent reason for repeat caesarean delivery in about 67 percent of parous women. All pregnancies with a history of caesarean section have a documented incidence of uterine scar problems ranging from 0.2% to 4.3%.⁷ Many

obstetricians do recurrent caesarean sections out of concern about uterine scar issues, often without strong reasons since uterine rupture is a terrible side effect of trying vaginal birth, which raises both morbidity and mortality in mother and child.³ The integrity of scarred LUS has been evaluated using a variety of sophisticated techniques, including "postoperative echographic examination of the uterine wound, interval hystero-graphy, magnetic resonance imaging, and amniography".⁸

Sonographic techniques, which are affordable and widely accessible, may be used to measure the thickness of the lower uterine segment as shown by many studies. The uterine scar rupture/dehiscence after birth is negatively linked with LUS thickness as determined by ultrasonography during the third trimester of pregnancy. In women who have previously had a caesarean section, a sonographic evaluation of the LUS has been utilized to detect a uterine abnormality and assess the degree of LUS thinning.^{9,10} In our institute we rely on clinical signs and scar tenderness for impending uterine scar dehiscence/uterine rupture, in women admitted for trial of labour after previous CS. But multiple studies have demonstrated that careful intra-partum treatment, sonographic findings, and consideration of clinical aspects may enhance the frequency of successful VBACs with a low risk of uterine ruptures and associated problems.¹¹ The aims of the present study is to evaluate the ultra-sonographic measurement of lower segment uterine scar (LUS) thickness in women with previous one lower segment caesarean delivery and its association with obstetric outcomes in the index pregnancy.

MATERIALS AND METHODS

This prospective observational study was conducted in department of obstetrics and gynecology, Lady Reading Hospital, Peshawar, for a period of 6 months, after approval from hospital ethical committee from June 2021 to December 2021. The overall sample size based on WHO sample size calculator was 120 patients. Informed consent was signed from all the participants. The inclusion criteria of our study were women with prior lower segment caesarean section, with gestational age of more than 37-40 weeks cephalic presentation and singleton pregnancy. The exclusion criteria of our study were absolute indication for caesarean section (Contracted pelvis, Placenta previa, Placental abruption, Placenta accreta spectrum), scars like hysterotomy, myomectomy, congenital fetal/uterine abnormality, earlier classical caesarean, uterus with inverted J or T shaped incision, disorders that might affect outcomes of mother and inter delivery interval of less than eighteen months.

Following a thorough obstetric history that paid particular attention to prior caesarean deliveries, a general, systemic, physical and obstetrical assessment

was performed. Prior to the start of labour, obstetric ultrasound was done at routine ≥ 37 weeks of gestation, or upon admission. Every woman who wanted to give birth vaginally received a trial of labor. Patients were monitored for spontaneous labor progression. For emergency CS, all of the instances were prepared properly. Every four hours, or more often if necessary, a vaginal examination was performed to check on the progress of labour. At the first sign of any discrepancy, an emergency caesarean section was decided upon. An association between the intraoperative results ("thinned out scar, scar dehiscence, and rupture") and the sonographic findings was observed. On a well-organized proforma, we entered all the pertinent data. To measure the thickness of the lower uterine segment scar (LUS), trans-abdominal sonography was performed for all the enrolled women. For data analysis, data were input into SPSS version 20. Results were presented in terms of numbers, percentages, mean and standard deviations. To analyze the relationship between the variables, a Chi-square test was used. A p value below 0.05 was considered as statistical significant.

RESULTS

In the current study, totally 120 participants were enrolled. Out of 120 participants, the age of the 84 (70%) patients was <30 years while the age of 36 (30%) was >30 years. The mean age (SD) of the patients was 28 (4.32) years. (Figure 1) Based on gestational age, 90 (75%) patients had gestational age of 38-40 weeks while 30 (25%) patients had gestational age of 37-38 weeks. (Figure 2) Amongst the 120 participants, emergency C-section was done in 27 (22.5%) patients, vaginal delivery in 66 (55%) whereas elective C-section was done in 27 (22.5%) patients. (Figure 3) Based on Scar Thickness, 24 (20%) patients has Scar Thickness of 2.5-3mm, 84 (70%) had 3.1-5mm scar thickness whereas 12 (10%) patients had scar thickness of >5 mm. (Figure 4) Based on the association between the lower uterine segment scar thickness and mode of delivery, significant association was observed ($p=0.001$). Amongst patients with scar thickness of 2.5-3mm, the emergency C-section was done in 12 (50%) patients, vaginal delivery in 5 (20.83%) whereas elective C-section was done in 7 (29.17%) patients. Amongst patients with scar thickness of 3.1-5mm, the emergency C-section was done in 12(14.29%) patients, vaginal delivery in 57 (67.85%) whereas elective C-section was done in 15(18.86%) patients. Amongst patients with scar thickness of >5 mm, the emergency C-section was done in 3 (25%) patients, vaginal delivery in 4 (33.33%) whereas elective C-section was done in 5(41.67%) patients. (Table 1)

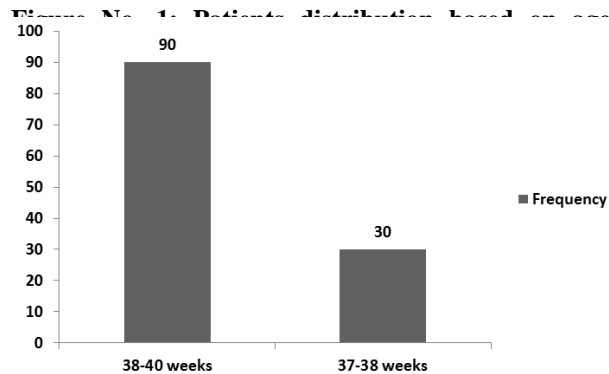
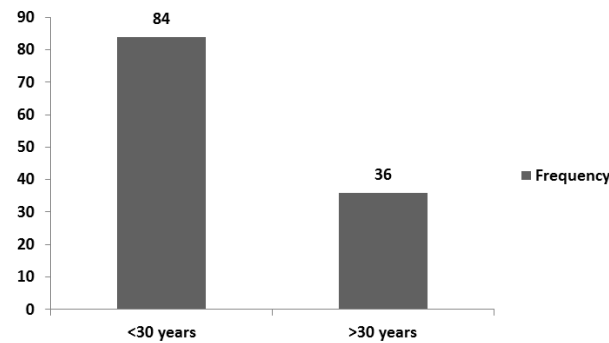


Figure No. 2: Patients frequency based on gestational age

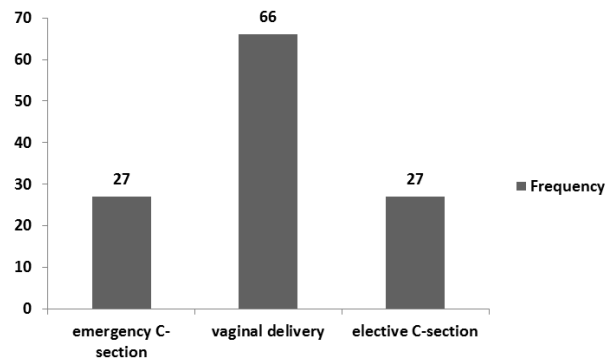


Figure No. 3: Patients frequency based on mode of deliveries

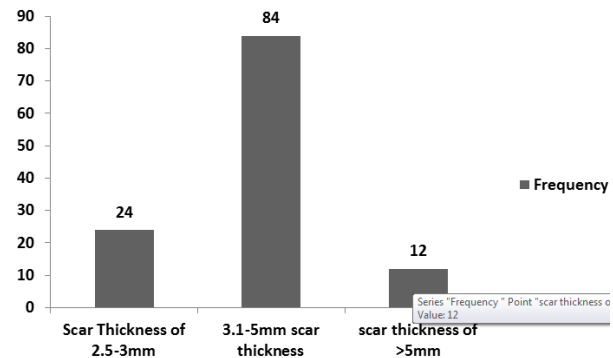


Figure No. 4: Frequency of patients based on scar thickness

Table No. 1: Association between the lower uterine segment scar thickness and mode of delivery

Scar thickness	Mode of delivery			P value
	emergency C-section	vaginal delivery	elective C-section	
2.5-3mm	12 (50%)	5 (20.83%)	7 (29.17%)	0.001
3.1-5mm	12(14.29%)	57 (67.85%)	15(18.86%)	
>5mm	3 (25%)	4 (33.33%)	5(41.67%)	

Table No. 2: Association between the scar status at the time of delivery and LUS thickness

Scar status	Mode of delivery			P value
	emergency C-section	vaginal delivery	elective C-section	
Thick	8 (29.63%)	Not assessed	7 (25.93%)	0.001
Thin	11 (40.74%)	Not assessed	12 (44.44%)	
Very thin	7 (22.22%)	Not assessed	8 (29.63%)	
Scar dehiscence	1 (3.70%)	Not assessed	00 (00)	

Significant association was observed between the scar status at the time of delivery and LUS thickness (p=0.001). Amongst the 27 participants of emergency C-section, 8 (29.63%) patients had thick scar, 11 (40.74%) patients had thin scar, 7 (22.22%) had very thin scar and only one patient (3.70%) had Scar dehiscence whereas amongst 27 patients with elective C-section, 7 (25.93%) patients had thick scar, 12 (44.44%) patients had thin scar, 8 (29.63%) had very

thin scar and no patients (n=0) had Scar dehiscence. (Table 2)

DISCUSSION

To give a trial of labour to women who have previously had a Cesarean birth is a significant problem for obstetricians in modern obstetric practice. The most serious complication is uterine rupture or scar dehiscence, the incidence of which ranges from 0.3% to 3.8%¹². There is a chance that a thin LUS with a scar

would rupture during childbirth, posing a serious danger to both the mother and the fetus in terms of morbidity and death. Its assessment has become crucial before birth in order to allow low-risk women to try labour and high-risk women to schedule planned Caesarean sections. According to numerous investigations, the LUS thinning, as determined by ultrasonography at various stages of pregnancy, is a marker of uterine rupture. In a meta-analysis of 12 papers on LUS status and the possibility of uterine scar defect, Jastrow et al. (2010) found a significant correlation between the degree of LUS thinning and the likelihood of uterine defects.¹³

In the current study, totally 120 participants were enrolled. Out of 120 participants, the age of the 70% patients was <30 years while the age of 30% was >30 years. The mean age (SD) of the patients was 28 (4.32) years. Based on gestational age, 75% patients had gestational age of 38-40 weeks while 25% patients had gestational age of 37-38 weeks. Amongst the 120 participants, emergency C-section was done in 6 (5%) patients, vaginal delivery in 66 (55%) whereas elective C-section was done in 48 (40%) patients. Based on Scar Thickness, 20% patients has Scar Thickness of 2.5-3mm, 12 (10%) had 3.1-5mm scar thickness whereas 84 (70%) patients had scar thickness of >5mm. In accordance with our study another study carried out by Habiba S A et al. in 2017 reported comparable results. In their study majority of the patients were less than 30 years of age and gestational age of the majority participants was 37-40 weeks. Mode of delivery and thickness of scar was also comparable to our findings.¹⁴

In our study, Based on the association between the lower uterine segment scar thickness and mode of delivery, significant association was observed ($p=0.001$). Amongst patients with scar thickness of 2.5-3mm, the emergency C-section was done in 12 (50%) patients, vaginal delivery in 5 (20.83%) whereas elective C-section was done in 7 (29.17%) patients. Amongst patients with scar thickness of 3.1-5mm, the emergency C-section was done in 12(14.29%) patients, vaginal delivery in 57 (67.85%) whereas elective C-section was done in 15(18.86%) patients. Amongst patients with scar thickness of >5mm, the emergency C-section was done in 3 (25%) patients, vaginal delivery in 4 (33.33%) whereas elective C-section was done in 5(41.67%) patients. Significant association was observed between the scar status at the time of delivery and LUS thickness ($p=0.001$). Amongst the 27 participants of emergency C-section, 8 (29.63%) patients had thick scar, 11 (40.74%) patients had thin scar, 7 (22.22%) had very thin scar and only one patient (3.70%) had Scar dehiscence whereas amongst 27 patients with elective C-section, 7 (25.93%) patients had thick scar, 12 (44.44%) patients had thin scar, 8 (29.63%) had very thin scar and no patients ($n=0$) had Scar dehiscence. Another study reported comparable

results to our findings. Based on the criteria for inclusion, 180 patients in total were included in their research. LUS thickness measurements taken throughout pregnancy were shown to significantly correlate ($p=.001$) with scar status after birth. Scar thickness and method of delivery did not significantly correlate ($p=.390$). Only one of their research subjects had a scar dehiscence.¹⁴ Another study carried by T Ganapathi and H K Chaudhari reported comparable results to our study. In their research, 55% of women delivered vaginally, 7% needed an instrumental birth, and 45% needed a second cesarean section. They observed a significant association between mode of delivery and LUS thickness which is similar with our study (12). The VBAC rate in a research conducted by Nilanchali et al. (2014) was 67%.¹⁵ In a different research by Wadhwan S et al., 63% of patients with a history of LSCS had a safe VBAC. In a 2013 research by Goel S. et al., 60% of women with a history of LSCS had successful VBAC.¹⁶ Large studies are urgently needed to determine the impact of many variables, including the time between pregnancies, previous vaginal births, the number of previous Caesarean section and previous labor, on the scar status in women who have had prior caesarean section..

CONCLUSION

According to the findings of our research, prenatal evaluation of the lower uterine segment in women who have had prior cesarean sections is a valid technique for selecting women who should be given a chance to try labor. Our research has shown that a LUS thickness of 3.1-5 mm at 38–40 weeks of gestation is linked to a higher likelihood of a successful VBAC. Multicentre studies with large sample size are needed for better outcomes..

Author's Contribution:

Concept & Design of Study:	Syeda Sitwat Fatima
Drafting:	Shahida Sultan, Amna Fareed
Data Analysis:	Amna Fareed
Revisiting Critically:	Syeda Sitwat Fatima, Shahida Sultan
Final Approval of version:	Syeda Sitwat Fatima

Conflict of Interest: The study has no conflict of interest to declare by any author.

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