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Research Article

**THE PREVIOUS CAESAREAN SCAR INTEGRITY BY  
TRANSVAGINAL ULTRASOUND DURING PREGNANCY AND  
ITS OBSTETRIC SUCCESS RATIO CORRELATION WITH  
LOWER UTERINE SEGMENT INTEGRITY**<sup>1</sup>Dr. Khansaw Iqbal, <sup>2</sup>Sana Fatima, <sup>3</sup>Dr. Muhammad Ibrar<sup>1</sup>RHC Mustafabad Kasur<sup>2</sup>Mayo Hospital Lahore<sup>3</sup>THQ Hospital Kharian**Abstract:**

**Objectives:** To assess the thickness of the lower uterine segment with transvaginal ultrasonography (TVS) and correlate with the obstetric outcome, and to obtain a critical cut value that is safe for vaginal birth.

**Study Design:** A prospective study.

**Place and Duration:** The study was held in Mayo Hospital, Lahore for the period of one year from March 2016 to March 2017.

**Methods:** In study group there were 140 control subjects with cesarean section History between the gestational weeks 37-40 and 100 prenatal women without the same profile uterine surgical tale in the control group. With TVS, lower uterine segment (LUS) was scanned. All the women were followed up after giving birth, and then two groups were made for the birth mode. Statistical analysis was performed by applying chi-square test.

**Findings:** Vaginal success rate (VBAC) and VBAC success rate after caesarean delivery were 48.57% and 65.38% respectively. The critical cut-off value for the safe thickness of the sub-segment derived from the receiver's characteristic curve is 2.5 mm.

**Conclusion:** TVS measures the thickness of the lower uterine segment, allowing for the assessment of scar complications and hence the management of the patient more safely.

**Keywords:** Cesarean section, transvaginal ultrasonography, vaginal delivery after cesarean section, lower uterine segment.

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**INTRODUCTION:**

The cesarean birth rate is mainly increased due to the incidence of elective cesarean section (CS), which represents a third of CS. In Pakistan, cesarean rates vary between 7% and 25% depending on the institution. "A cesarean section is always the cesarean section" (TOL) cesarean section (SSVD) and the evidence of labor after vaginal birth 1 times the famous obstetrician gynecologic science "was a scary increase in cesarean rates that appeared as an option for reducing the American College Obstetrics and Gynecologists The Implementation Committee (ACOG) stated that most women candidates with pre-cesarean delivery with low transverse incision should be advised about SSNG and TOL should be offered. The most frightening complication with TOL is scarring associated with sudden and / or fetal morbidity and mortality. However, the risk of uterine rupture in women who previously worked with CS. Compared to 0.5% in women with spontaneous labor after previous CS3, it ranges from 0.2% to 1.5% after labor induction. The success of VBAC depends mainly on the indication of primary cesarean section. Success rates were higher for recurrent indications than for recurrent ones. Several diagnostic modalities have been used to predict the integrity of the lower uterine segment (LUS) and also to determine the safety of VBAC. Here, transvaginal sonography (TVS) was used to measure the correlation thickness with the uterine lower segment (LUS), obstetric outcome, and to obtain a critical LUS thickness that is predictable for vaginal delivery.

**MATERIALS AND METHODS:**

This prospective study was held in Mayo Hospital, Lahore for the period of one year from March 2016 to march 2017.

In the study group, 140 prenatal women (37-40 weeks) with cesarean section birth and 100 prenatal women without cesarean section or uterine surgery were evaluated as controls. Selection criteria for test labor (TOL) was a clinically inappropriate recurrent cesarean section, previous low cross-cut maternal pelvis, a definite indicator for cesarean section, Vertex, Pro bishops or obstetric medical complications. Exclusion criteria for postpartum uterine contraction, pelvic contraction cesarean

section (TOLAC) before malpresentation, multiple pregnancies, low placenta, abnormal amniotic fluid volume, filtration vaginum, previous classical caesarean section T before the current gestation or CPD expectation. All women underwent a detailed examination of anamnesis and a transabdominal sonography (TMS) and transvaginal sonography (TVS) followed by (general systemic and obstetric). Scanning The Medison Model SA 8000 AG was performed with a transponder probe with a frequency of 3.5 MHz and a frequency of 7 MHz to generate an abdominal convex probe array. TMS, gestational, localization and classification of placenta, liquor, fetal heart activity and severe congenital anomalies with observed variables age predicted. The TVS was performed with a partially filled bladder and the LUS was assessed to determine the thickness of the thinnest area and the localized defect. USG LUS is a three-layer structure (I) endometrium membrane (ii) side by side myometrium layer and side by side with muscle layer and bladder mucosa, (iii) uterovaginal peritoneal reflection is decidualized. LUS was examined longitudinally and transversely to define the previous uterine scar. The weakening zone of the LUS was located in the middle sagittal plane along the cervical canal. This area was elongated for accurate measurement, and scar thick- ness measurement was performed with the bladder and myometrium / the interface myometrial wall cursor of amniotic membrane integrity. Two measurements were taken and the mean was taken as the skar thickness. LUS was scanned to detect any wedge deformation, balloon, funnel or defect.

**RESULTS:**

The majority of prenatal women were in the 21-30 age group, with an average age of 25.2. The observed mean parity was 1.2 and the average gestational age at delivery was 38-39 weeks. The maximum number of women with hemoglobin (Hb) level was reported as 8-9 gm. Taking into account the duration, the active and average working phases were found to be 6.8 hours and 3.59 hours, respectively (Table-1). Of the total 140 prenatal females in the study group, 36 (25.71%) were protected for elective cesarean section.

**Table 1: Patient profile**

Patients characteristics	Study group		Control group		P value
	Mean	S.D.	Mean	S.D.	
Age (years)	25.20	3.19	24.70	2.85	>0.05
Parity	1.26	0.50	1.36	0.63	>0.05
Period of gestation (weeks)	38.40	0.85	38.66	0.946	>0.05
Hb (gm/dl)	9.5	0.5	9.2	0.5	>0.05
Duration of latent phase of labor in patients with vaginal delivery (hours)	6.86	2.70	6.95	2.27	>0.05
Duration of active phase of labor in patients with vaginal delivery (hours)	3.59	1.47	3.90	1.46	>0.05

All women undergoing TOL were followed up with continuous external fetal monitoring. 104 (74.28%) of the women were TOL, 36 were emergency cesarean, and 68 were VBAC successful. Total VBAC rate was 48.57% and VBAC success rate was 65.38% (Table-2).

**Table 2: Mode of Delivery**

Mode of delivery	Study group		Control group	
	No.	%	No.	%
Elective repeat caesarean	36	25.71	-	-
Trial of labor group	104	74.28	-	-
a) Successful trial of labor	68	65.38	92	92
b) Emergency caesarean	36	34.61	8	8

Transvaginal ultrasonography showed a mean LUS thickness of  $3.23 \pm 0.911$  mm and  $3.59 \pm 0.63$  mm ( $p < 0.05$ ) in the study and control groups, respectively (Table-3).

**Table 3: Lus thickness on transvaginal ultrasonography**

Scar thickness (mm)	Study group		Control group	
	No.	%	No.	%
<2.0 mm	11	7.8	-	-
2.1-2.5 mm	17	12.14	2	2
2.6-3.0 mm	42	30	16	16
3.1-3.5 mm	28	20	20	20
3.6-4.0 mm	17	12.14	38	38
4.1-4.5 mm	14	10.00	10	10
4.6-5.0 mm	3	2.14	6	6
5.1-5.5 mm	6	4.28	2	2
>5.5 mm	2	1.43	6	6
Mean LUS thickness	3.23		3.59	
SD	0.94		0.633	
P value	<0.05		<0.05	

LUS has a thickness of 2.5 mm, SSND success rate is zero, while LUS has a thickness of 2.5-3.0 mm SSND and 67.74% of the thickness (Table 4).

**Table 4: Correlation of lus thickness with successful vbac**

LUS thickness in TVS (in mm)	Study group		VBAC		Emergency caesarean		Elective caesarean		VBAC rate	VBAC success rate
	No.	%	No.	%	No.	%	No.	%		
<2.0	11	7.8	-	-	6	54.5	5	45.0	0	0
2.1-2.5 mm	17	12.14	-	-	9	52.94	8	47.05	0	0
2.6-3.0 mm	42	30	21	50	10	23.8	11	26.2	50.00	67.74
3.1-3.5 mm	28	20	18	64.28	5	17.85	5	17.85	64.28	78.26
3.6-4.0 mm	17	12.14	9	52.99	4	23.52	4	33.53	52.93	69.23
4.1-4.5 mm	14	10	9	64.28	2	14.28	3	21.43	64.28	81.81
4.6-5.0 mm	3	2.14	3	100	-	-	-	-	100.00	100.00
5.1-5.5 mm	6	4.28	6	100	-	-	-	-	100.00	100.00
>5.5 mm	2	1.43	2	100	-	-	-	-	100.00	100.00

Sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) were 81.3%, 84%, 69.2% and 91.3%, respectively, with a cut of 2.5 mm. transvaginal ultrasonography, respectively (Table 5).

**Table 5: Sensitivity, Specificity, Ppv and Npv at Corresponding Lus Thickness**

LUS thickness	Sensitivity	Specificity	PPV	NPV
≤ 2.0 mm	63.6	100	100	86.2
2.1-2.5 mm	81.8	84	69.2	91.8
2.6-3.0 mm	90.9	72	58.8	94.7
3.1-3.5 mm	92.9	56	47.6	93.3
3.6-4.0 mm	90.9	24	34.5	85.7
4.1-4.5 mm	90.9	12	31.3	75
4.6-5.0 mm	100	8	32.4	100

### DISCUSSION:

In this study, the vast majority of women were diagnosed by N. Soni et al. Their average age was comparable to the work done by them. In this study, VBAC rate and VBAC success rate were 48.57% and 65.38% respectively, and Flam et al. 74% Singh et al. 6 reported similar success rates, 6 Pathania et al<sup>7</sup> and Iyer et al. In this study, it was found that the critical thickness cut of LUS obtained by transvaginal ultrasound is over 2.5 mm, and that reliable VBAC is possible. Specificity, PPV and NPV were 81.8%, 84%, 69.2% and 91.3%, respectively, in accordance with the study performed by Qureshi. They are taken as a 2 mm cut-off point. There was a very high correlation between perioperative LUS grading and LUS thickness measured at USG. All dissociation in the study group occurred at <2 mm. The thickness of LUS in control is similar to that observed by Qureshi et al., Greater than 2 mm.

### CONCLUSION:

The thickness of LUS is an excellent predictor of uterine scar defects in women who think of VBAC. However, the ideal cutting value is not recommended at this point, which underscores the need for more standard measurement techniques. Current medical evidence suggests that 60-80% of women have a successful vaginal delivery after cesarean section. For this reason labor testing should be encouraged under

vigilant fetal and maternal surveillance.

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