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# Assessment of Cesarean Scar Strength By Different Technique

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## Abstract

**Aim**: To evaluate the various methods for assessment of cesarean scar and there comparison during pregnancy.

**Methods**: This prospective study included 50 antenatal women with previous caesarean at term in study group and 50 antenatal women without H/O any uterine surgery of same profile in control group. LUS (lower uterine segment) was scanned using TAS (trans abdominal sonography) and TVS (trans vaginal sonogram) 2D as well 3D. All women were followed till delivery & further divided into 2 groups according to mode of delivery.

**Results**: It was found that as the thickness of LUS was more (2.5 mm or more), chances of vaginal delivery following trial of labour was high.

**Conclusion**: Antenatal ultrasonographic assessment specially 3D with trans vaginal probe can give fair idea of scar strength and more number of successful trial of labour is women with previous caesarean section.

**Keywords**: Lower uterine segment, caesarean section, Trans vaginal ultrasound.

## Introduction

Caesarean section rates have been steadily increasing and becoming an epidemic in most countries of world. In India too, depending on the institute, caesarean section varies from 7 to 25% and sometime as high as 45 to 65% in some hospitals specially in referral centers and health centers under central government health scheme(CGHS). Cesarean section may be associated with prolonged bed rest, restriction to routine activities, postpartum morbidity, mortality as well as more NICU admissions, perinatal morbidity and mortality.[1] This trend needs to be controlled so that prolong hospital stay and financial burden can be reduced. On other hand VBAC may be associated with a risk of uterine rupture and maternal and fetal consequence of uterine rupture can be serious & life threatening [2,3,4]. So there is a need to assess the integrity of uterine scar and risk factors before planning for trial of vaginal delivery.

Several methods have been used to evaluate the lower uterine segment after caesarean section. Sonographic methods abdominal as well as vaginal are being tried to evaluate the lower uterine segment thickness. If a

technique could be developed to predict the integrity of scarred uterus before labour, a large proportion of patients would be considered for trial of labour in future protocol. The purpose of this study is sonographic evaluation of lower uterine segment at term and its association with obstetrical outcome.

**Methods**:- This prospective case control study was carried out in the department of SN Medical College, Agra from, July12 to June 2014 with 50 antenatal women (gestational age 38 – 42 weeks) with history of one caesarean delivery in study group and 50 antenatal women with no previous caesarean or uterine surgery as control.

Inclusion criteria were antenatal patients with history of previous caesarean, at period. of gestation between 38 – 42 week latent phase of labour, vertex presentation, exclusion criteria includes non-vertex presentation, placental complications, multiple gestation, abnormal AFI, leaking per vaginum, previous classical caesarean section, uterine scar for any other surgery, patients with active labour. All the patients underwent a thorough history taking and complete examination followed by 2D and 3D transabdominal (TAS) and Transvaginal sonography (TVS) scanning was done. Estimation of gestational age, placental localization and grading, liquor, fetal cardiac activity, any gross congenital anomaly as well as thickness of lower segment at different places with 2D and 3D USG. TVS was done with partially full blander & LUS was evaluated for thickness of thinnest area and localized defect. On USG, LUS is found as 3 layered structure (1) chorioamniotic membrane with decidualised endometrium (2) middle layer of myometrium and (3) uterovesical peritoneal reflection juxtaposed to muscularis and mucosa of bladder.

LUS was examined longitudinally and transversely to identify the previous uterine scar. Thinning zone of LUS was identified in mid saggital plane along the cervical canal. This area was magnified for accurate measurement, and the measurement of scar thickness was taken with the cursors at urinary bladder wall myometrial interface and myometrium/chorioamniotic membrane, amniotic fluid interface. Two measurements were taken and average was taken as scar thickness. LUS was scanned to detect any dehiscence, ballooning, funneling or wedge defect. All women were followed till delivery. Women in study group were further segregated into two groups according to the mode of delivery.

Women with recurrent indications were posted for elective repeat caesarean section and women with no contraindication for vaginal delivery were allowed to go into spontaneous labour or induced. Women undergoing TOL were continuously monitored regarding maternal pulse, FHR, colour of liquor, bleeding pervaginum, scar tenderness and colour of urine. Patients who developed any maternal of fetal distress were taken for emergency caesarean section.

Statistical evaluation was done by using appropriate tests, p value <0.05 was considered significant.

**Result:** - Most of the antenatal women were found in the age group of 21.30 years with mean age of 25.07 +- 3.13 years in study group and 24.66 +- 3.36 years in control group. Mean parity seen was 1.28 in study group and 1.34 in control group. Mean gestational age was found to be 39.46 wks. in study group while 39.28 wks. in control group. Average latent and active phase of labour in study group was found to be 6.82 hrs. and 3.60 hrs. respectively (table - 1).

Out of the total 50 antenatal women in study group 14 (28%) were kept for repeat elective caesarean. Rest 36 (72%) women underwent trial of labour with continuous maternal and fetal monitoring. Out of 36 women kept for TOL, 13 had emerging caesarean and 23 had successful VBAC. (table – 2)

On transvaginal sonography mean LUS thickness was 3.30 1.05mm and 3.66 0.65mm ($p < 0.05$) in study and control group respectively (table – 3). No woman delivered vaginaly with LUS thickness < 2.5mm. While at thickness of 2.5 – 3.0 mm VBAC success rate was 63%. In the present study grade III and grade IV were considered abnormal LUS while I and II were considered normal LUS. Out of 27 (54%) cases (14 elective & 13 emergency) who had repeat caesarean, 8 (29.62%) had grade I LUS, and 9 (33.3%) had grade II LUS peroperatively while 7 (25.92%) and 3 (11.1%) had grade III and IV LUS peroperatively respectively. (table – 4). At a cut off of 2.5mm the sensitivity, specificity, positive predictive value and negative predictive value was 80.6%, 83%, 70% and 90.3% using transvaginal ultrasound respectively (table – 5).

**Discussion:** - In the present study mean age was found to be 25.07 years in study group and 24.66 years in the control group which was comparable to studies performed by *N. Soni et al*[5]. Mean LUS thickness was 3.30 mm in study group and 3.66 mm in control group. The LUS thickness was found to be statistically thicker compared to the study group similar to that observed by *Quereshi et al*[6] LUS thickness imaging on ultrasonography was used to assess the risk for intrapartum rupture or dehiscence. The risk of dehiscence was directly related to degree of thining & risk increases significantly when LUS thickness was 2.5 mm or less. In the present study VBAC success rate was 63%. This was consistent with study conducted by *Singh et al*[7]and *Pathania et al*[8] who found VBAC success rate 65.84% and 67.6% respectively. Similar success rate were reported by *Flam et al*[9] and *Iyer et al*[10]..

In the present study, the cut off LUS thickness derived was 2.5mm on transvaginal sonography. At this thickness, the sensitivity was 80.6j%, specificity was 83%, positive predictive value was 70% and negative predictive value was 90.3%. These findings were closely matched with that of *Quereshi etal*[6] and *Asakura et al*[11]. The high negative predictive value in the present study implies that a thick LUS is generally strong & may encourage obstetrician to offer trial of labour at LUS thickness of 2.5mm.

We conclude that sonography evaluation of LUS thickness is a reliable, practically useful method to predict the risk of scar rupture in a woman with previous caesarian section and trial of labour should be encouraged under vigilant fetal and maternal monitoring.

Table - 1. Patient profile:

| Patient characteristics | Study group | | Control group | | P. value |
|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | |
| Age (years) | 25.07 | 3.13 | 24.66 | 3.36 | >0.0 |
| Parity | 1.28 | 0.50 | 1.34 | 0.63 | >0.0 |
| Period of gestation | 39.36 | 0.98 | 39.28 | 0.92 | >0.0 |
| Duration of latent Phase of labour in patients with vaginal delivery (hours) | 6.82 | 2.70 | 6.96 | 2.27 | >0.0 |
| duration of active phase of labour in patient with vaginal delivery (hours) | 3.60 | 1.46 | 3.88 | 1.44 | >0.0 |

Table - 2. Mode of delivery:

| Mode of delivery | Study group | | Control | |
|---|---|---|---|---|
| | No. | % | No | % |
| Elective repeat caesarean | 14 | 28% | - | - |
| Trial of labour group | 36 | 72% | - | - |
| **a.** Successful trial of labour | 23 | 63.88% | 46 | 92% |
| **b.** emergency caesarean | 13 | 36.11% | 4 | 8% |

Table - 3. LUS thickness of transvaginal Ultrasonograghy

| Scar thickness (mm) | 50% Study group | | 50% control group | |
|---|---|---|---|---|
| | No | % | No. | % |
| <2.0 mm | 4 | 8% | - | - |
| 2.1 – 2.5 mm | 6 | 12% | 1 | 2% |
| 2.6 – 3.0 mm | 15 | 30% | 8 | 16% |
| 3.1 – 3.5 mm | 10 | 20% | 10 | 20% |
| 3.5 – 4.0 mm | 6 | 12% | 19 | 38% |
| 4.1 – 4.5 mm | 5 | 10% | 5 | 10% |
| 4.6 – 5.0 mm | 1 | 2% | 3 | 6% |
| 5.1 – 5.5 mm | 2 | 4% | 1 | 2% |
| >5.5 mm | 1 | 1% | 3 | 6% |
| Mean LUS thickness | 3.30 | | 3.66 | |

| | | | | |
|---|---|---|---|---|
| SD | 1.05 | | .65 | |
| p. value | <0.05 | | | |

Table - 4. LUS and outcome

| LUS thickness on TVS | Study group | Pu operative granding | | | | VBAC | | Repeat caesarean Section | | VBAC success |
|---|---|---|---|---|---|---|---|---|---|---|
| (in mm) | No. % | IV | III | II | I | No. | % | No. | % | Rate |
| <2 mm | 4 | 2(50%) | 2(50%) | - | - | - | - | 4 | 8 | 0 |
| 2.1 – 2.5 mm | 6 | 1(16.6%) | 2(33.3%) | 2(33.3%) | 1(16.6%) | - | - | 6 | 12% | 0 |
| 2.6 – 30 mm | 15 | - | 2925.0% | 3(37.5%) | 3(37.5%) | 7 | 14% | 8 | 16% | 63 |
| 3.1 – 3.5 mm | 10 | - | 1(25%) | 2(50%) | 1(25%) | 06 | 12% | 4 | 8% | 66 |
| 3.6 – 4.0 mm | 6 | - | - | 1(33.3%) | 2(66.6%) | 3 | 6% | 3 | 6% | 75 |
| 4.1 – 4.5 mm | 5 | - | - | 1(50%) | 1(50%) | 3 | 6% | 2 | 4% | 75 |
| 4.6 – 5.0 mm | 1 | - | - | - | - | 1 | 2 | -- | 100 | |
| 5.1 – 5.5 mm | 2 | - | - | - | - | 2 | 4 | - | - | 100 |
| >5.5 mm | 1 | - | - | - | - | 1 | 2 | - | - | 100 |

Table - 5. LUS thickness and sensitivity pattern:

| **LUS thickness** | **sensitivity** | **Specificity** | **PPV** | **NPV** |
|---|---|---|---|---|
| <2 mm | 62.4 | 100% | 100 | 52.8 |
| <2.5 mm | 81.6 | 83% | 71 | 90.3 |
| <3.0 mm | 89.7 | 70% | 56.8 | 90.4 |
| <3.5 mm | 91.7 | 54% | 47.5 | 94.5 |
| <4.0 mm | 87.7 | 22% | 36.4 | 82.2 |

| | | | | |
|---|---|---|---|---|
| <4.5 mm | 91.1 | 10% | 32.2 | 76.4 |
| <5.0 mm | 99.9 | 6% | 27.6 | 100 |

**References**


1. Liu S. Listin RM. et al Maternal mortality and severe morbity associated with low risk planned cesarean delivery verses planned vaginal delivery at term. CMAJ 2007 Feb 13; 176(4): 455-460
2. Hillian EM. Postoperative morbity following cesarean delivery. JAv Nurs 1995;22: 1035-42.
3. Liu .S, Heaman M. Joseph KS,et al;Maternal health study group of the Canadian perinatal surveillance systemrisk of maternal postpartum readmission associated with mode of delivery. Obstet Gynecol 2005 ; 105:836.
4. Abdel Baset F Mohammed, Diaa A. Al-Mog'hazi, Mamdouh T. Hamdy, Enas M. Mohammed. Ultrasonographic evaluation of lower uterine segment thickness in pregnant women with previous caesarean section. Middle East Fertility Society Journal 2010; 15: 188 – 193.
5. Neelu Soni, Sumita Dhegle. Assessent of lower uterine segment caesarean scar by ultrasonography and its clinical correlation. Arian Journal of Obs & Gynae Practice 2010; 1: 8-12.
6. Qureshi B, Inafuku K, Masamoto H, Kanezawa K. Ultrasonographic evaluation of lower uterine segment to predict the integrity and quality of caesarean scar during pregnancy. A prospective study. Tohukas J Exp Med 1997; 183(1): 55 – 65.
7. Singh VK, Nawani M, Bhagliwal A, Rohtagi B. Trial of labour in patients with previous caesarean section. J Obst. Gyne India 1995, 45(5): 640 – 4.
8. Pathania K, Premi HK, Gupta T, Sood A. Delivery following previous caesarean section (A prospective study) J Obst. Gyne India 2000; 50(4): 63 – 67.
9. Flamm BL, New man LA, Thomas SJ, Fallon D, Yoshida MM. Vaginal birth after caesarean delivery: Results of a 5 year multicentre collaboration study. Obstet Gynecol 1990; 76: 750.
10. Iyer S, Hand PR, Basu SB, Delivery after one previous caesarean section – one year prospective study. J Obst. Gyne India 2001; 51(2): 51 – 4.
11. Asakura H, Nakai A, Ishikawa G, Suzuki S, Araki T. Prediction of uterine dehiscence by measuring lower uterine segment thickness prior to the onset of labour: evaluation by transvagial ultrasonography. J Nippon Med Sch 2000; 67(5): 352 – 6.