

SONOGRAPHIC PREDICTION OF SCAR DEHISCENCE IN WOMEN WITH PREVIOUS CAESAREAN SECTION

Shubhada Suhas Jajoo¹, Joseph Stalin Augusti Mary Priyanka²

¹Associate Professor, Department of Obstetrics and Gynaecology, Datta Meghe Institute of Medical Sciences, Sawangi, Wardha, Maharashtra.

²Second Year Postgraduate Student, Department of Obstetrics and Gynaecology, Datta Meghe Institute of Medical Sciences, Sawangi, Wardha, Maharashtra.

ABSTRACT

BACKGROUND

Caesarean section (Sectio Caesarea) is a surgical method for the completion of delivery. After various historical modifications of operative techniques, modern approach consists in the transverse dissection of the anterior wall of the uterus. The rate of vaginal birth after caesarean section was significantly reduced from year to year and the rate of repeated caesarean section is increased during the past 10 years. Evaluation of scar thickness is done by ultrasound, but it is still debatable size of thick scar that would be guiding "cut-off value" for the completion of the delivery method. To better assess the risk of uterine rupture, some authors have proposed sonographic measurement of lower uterine segment thickness near term assuming that there is an inverse correlation between LUS thickness and the risk of uterine scar defect. Therefore, this assessment for the management of women with prior CS may increase safety during labour by selecting women with the lowest risk of uterine rupture.

The aim of the study is to study the diagnostic accuracy of sonographic measurements of the Lower Uterine Segment (LUS) thickness near term in predicting uterine scar defects in women with prior Caesarean Section (CS). We aim to ascertain the best cut-off values for predicting uterine rupture.

MATERIALS AND METHODS

100 antenatal women with history of previous one LSCS who come to attend antenatal clinic will be assessed for scar thickness by transabdominal ultrasonography and its correlation with intraoperative findings. This prospective longitudinal study was conducted for 1 year after IEC approval with inclusion criteria previous one LSCS. Exclusion criteria- 1) Previous myomectomy scar; 2) Previous 2 LSCS; 3) Previous hysterotomy scar.

RESULTS

Our findings indicate that there is a strong association between degree of LUS thinning measured near term and the risk of uterine scar defect at birth. In our study, optimal cut-off value for predicting uterine scar defect is 3.9 mm.

CONCLUSION

Sonographic measurement of scar thickness is an excellent method for safely predicting the risk of scar dehiscence/rupture in women with previous one CS. With different cut-off values in different studies, critical thickness of LUS for evaluation of scar defects is need of the hour to save many pregnant women and babies from significant morbidity and mortality.

KEYWORDS

Caesarean Section, Uterine Scar Dehiscence, Sonographic Prediction.

HOW TO CITE THIS ARTICLE: Jajoo SS, Priyanka JSAM. Sonographic prediction of scar dehiscence in women with previous caesarean section. J. Evid. Based Med. Healthc. 2018; 5(1), 71-74. DOI: 10.18410/jebmh/2018/16

BACKGROUND

Caesarean Section (CS) rates are increasing worldwide. Previous CS is becoming the most common indication for CS confirming the age old dictum proposed by Edward Craigin in 1914 "once a caesarean always a caesarean." Incidence of uterine scar dehiscence irrespective of cause is around 0.6% worldwide.¹ Several methods have been used to

evaluate the lower uterine segment after caesarean section. Sonographic methods can be used 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 a trial of labour in future protocol.

Although, the absolute risk of uterine dehiscence/rupture in lower segment CS is very low (0.2-1.5%).¹ The unpredictable nature of this complication and its grave consequences for both mother and baby has resulted in decreased rates of Trial of Labor After CS (TOLAC) in many countries. Ultrasound estimation of Lower Uterine Segment (LUS) thickness provides a fairly simple and non-invasive method for prediction of scar dehiscence/rupture.

Financial or Other, Competing Interest: None.

Submission 23-11-2017, Peer Review 15-12-2017,

Acceptance 25-12-2017, Published 01-01-2018.

Corresponding Author:

Dr. Joseph Stalin Augusti Mary Priyanka,

Plat No. 102, Subhadra Mansion, Sawangi, Wardha-442001.

E-mail: draugusti16@gmail.com

DOI: 10.18410/jebmh/2018/16



The successful outcome of TOLAC depends on the scar of previous CS, which is directly related to its thickness is generally considered that, among carefully selected patients who have full participation in decision making, most women with 1 previous lower segment transverse caesarean delivery are suitable candidates for VBAC and should be offered a trial of labor.

Hence, the present study was planned to estimate the risk of scar dehiscence/rupture by Transabdominal Ultrasound (TAS) to determine the correlation between LUS thickness measured by TAS with actual thickness graded during surgery and to ascertain an optimal cut-off value of scar thickness.

Aims and Objectives- To study the diagnostic accuracy of sonographic measurements of the Lower Uterine Segment (LUS) thickness near term in predicting uterine scar defects in women with prior Caesarean Section (CS). We aim to ascertain the best cut-off values for predicting uterine rupture.

MATERIALS AND METHODS

The present study was conducted in Department of Obstetrics and Gynaecology at AVBRH, Wardha, from April 2016 to March 2017.

Methodology- 100 women with history of previous one LSCS was measured for scar thickness by transabdominal ultrasonography (USG Machine Aloka Arietta - 70 USG - Curvilinear Probe 3-5 MHz).

The findings at caesarean section were classified into 4 grades as described by Qureshi et al.²

Ultrasound scar thickness and findings at caesarean section were correlated.

Inclusion Criteria- Singleton term pregnancy with previous one LSCS.

Exclusion Criteria- Multiple pregnancy, placenta previa, previous classical caesarean section/hysterotomy and previous uterine surgery other than CS.

Transabdominal sonography was carried out with a full bladder (to the extent that the patient had the urge to void). The LUS was examined longitudinally and transversely to identify any areas of obvious dehiscence or rupture (any balloon effect as described by Michaels et al consisting of any abnormal bulging of the outer layer associated with foetal movement or changes in amniotic fluid pressure against the urinary bladder base was noted).

The thinnest zone of the lower segment was identified at the mid sagittal plane along the cervical canal (this area was magnified to the extent that any slight movement of the caliper would produce a change in measurement by only 0.1 mm).

The measurement was taken with the cursors at the urinary bladder wall - myometrium interface and the myometrium/chorioamniotic membrane, amniotic fluid interface.

At least, 2 measurements were made and the lowest value was taken as the LUS thickness.

During CS, surgeon made an objective evaluation of the integrity and thickness of the LUS as described by Qureshi et al.²

The LUS was graded as follows-

- Grade I (LUS was well developed).
- Grade II (LUS was thin without visible content).
- Grade III (LUS was translucent with visible content).
- Grade IV (LUS had well-circumscribed defects, either dehiscence or rupture).

OBSERVATION AND RESULTS

Distribution of patients according to age in years, BMI and gravida.

Age Group (Years)	Number of Women	Percentage
20-25 years	44	44
26-31 years	45	45
32-37 years	10	10
>37 years	1	1
Total	100	100
Mean ± SD	26.60 ± 3.99 (20-38 years)	

Table 1. Distribution of Age in Years

Majority of the patients in present study were from age group 20-31 years (89%).

BMI (kg/m2)	Number of Women	Percentage
Underweight (<18.5)	0	0
Normal weight (18.5-24.9)	79	79
Overweight (25-29.9)	8	8
Obese (30 or more)	13	13
Total	100	100
Mean ± SD	28.16 ± 1.87	

Table 2. Distribution of BMI

Gravida	Number of Women	Percentage
Gravida 2	69	69
Gravida 3	18	18
Gravida 4	7	7
Gravida 5	5	5
Gravida 6	1	1
Total	100	100

Table 3. Distribution of Gravida

Maximum number of patients were gravida 2 (69%), this is probably due to trend of small family norm.

Indications of LSCS	No. of Women	Percentage
CPD	22	22
Foetal distress	14	14
PIH + failure of induction + NPOL	30	30
Abnormal presentation	9	9
Oligo + Doppler changes	20	20
Twins	5	5
Total	100	100

Table 4. Distribution of Patients According to Indications of LSCS in Previous Pregnancy

Interdelivery Interval	Number of Women	Percentage
<18 months	7	7
18-36 months	50	50
>36 months	43	43
Total	100	100
Mean ± SD	48.12 ± 23.08 Months	
Scar Thickness		
2-3.5	41	41
3.6-5	53	53
>5	6	6
Total	100	100
Mean ± SD	3.91 ± 0.90 (2.50-8)	

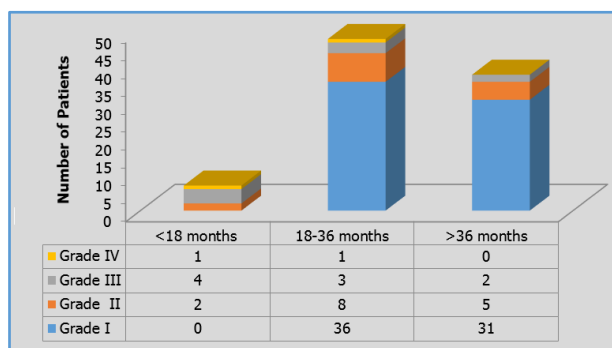
Table 5. Distribution of Patients According to Interdelivery Interval in Months and Scar Thickness in mm

Mode of Delivery	Number of Women	Percentage
LSCS	93	93
VBAC	7	7
Total	100	100

Table 6. Distribution of Patients According to Mode of Delivery in the Present Pregnancy

Interdelivery Interval	Number of Women	Grade I	Grade II	Grade III	Grade IV
<18 months	7	0	2	4	1
18-36 months	48	36	8	3	1
>36 months	38	31	5	2	0
Total	93	67	15	9	2
p-value	29.73; p-value=0.0001, S				

Table 7. Interdelivery Interval from Last CS and Correlation with Intraoperative Grades II, III and IV of LUS



Graph 1. Interdelivery Interval from Last CS and Correlation with Intraoperative Grades II, III and IV of LUS

DISCUSSION

Out of 100 patients, 60 patients underwent LSCS without giving trial of labour, 40 patients having nonrecurring indications with scar thickness >3.9 mm were given trial of labour, 7 patients delivered vaginally, while 33 patients underwent repeat LSCS. Abandoning of a trial was mainly due to foetal distress and non-progress of labour in majority of cases.

Our findings indicate that there is a strong association between degree of LUS thinning measured near term and the risk of uterine scar defect at birth. In our study, optimal cut-off value for predicting uterine scar defect is 3.9 mm. Dehiscence was found in 2 patients.

In a prospective study in which women who had the thickness of their lower uterine segment measured with ultrasound were followed up with regard to pregnancy outcome, the rate of uterine rupture or dehiscence is on average 6.6% (range 1% to 46%).³ A prospective observational study by Rozenberg et al. The aim of the study⁴ was to estimate the sensitivity and specificity of the full lower uterine segment thickness as measured by transabdominal ultrasound with regard to uterine rupture or dehiscence. It includes 642 women with a caesarean scar who had their full lower uterine segment thickness measured with transabdominal ultrasound at 36-38 gestational weeks by one single ultrasound examiner. The full lower uterine segment thickness varied between 1.6 and 12.3 mm. Uterine rupture and uterine dehiscence were diagnosed either at caesarean section or by uterine exploration after vaginal delivery. Uterine rupture was diagnosed in 15 (2.3%) women and uterine dehiscence in 10 (1.6%) women, i.e. the rate of uterine defect was 3.9%. The authors themselves suggested a cut-off of 3.5 mm to be optimal and suitable for clinical use, values for full lower uterine segment thickness <3.5 mm being taken to indicate a high risk of uterine rupture. In their study population, this cut-off had a sensitivity of 88% and a specificity of 73%.^{3,4,5}

Jastrow et al in a systematic review published in 2010,⁶ the aim was to estimate the strength of the association between sonographic thickness of the lower uterine segment in women who had undergone caesarean delivery and uterine scar dehiscence or rupture and to find the best cut-off value for the thickness of the lower uterine segment with regard to predicting uterine dehiscence or rupture.

They reviewed 12 studies between 1988 to 2009 including 1834 women and with a 6.6% rate of uterine scar defects confirmed the strong association between degree of LUS thickness and risk of uterine scar defect at delivery. The cut-off value proposed for predicting these complications varied between 2.0 and 3.5 mm.

Sandip Lahiri et al in a prospective study done in Malda Medical College and Hospital, West Bengal, in 2014.⁷ Lower uterine segment thickness measured by ultrasonography correlated well with the thickness measured by Vernier calipers at caesarean section. Sensitivity of 92.86%, specificity of 77.27%, positive predictive value of 83.87% and negative predictive value of 89.47% suggested that if the thickness of lower uterine segment was 2.6 mm.

The study by Bujold et al also confirms the same. Using the thinnest of the two LUS measurements, they proposed a cut-off value of 2.3 mm.

CONCLUSION

In our study, we found a strong association between the sonographic prediction of lower uterine segment thinning at term and uterine scar defect at the time of delivery. In our study, the cut-off value of scar thickness is 3.9 mm. Therefore, while selecting patient of TOLAC, one should have well-investigated parameters like ultrasound measurement of scar thickness, nonrecurring indication of LSCS in previous pregnancy and interdelivery interval with

proper intrapartum management. VBAC should be considered in cases of previous one caesarean section done for non-recurrent indications. Repeat LSCS rate is higher due to trend towards less trial of labour and early decision of repeat LSCS. There is a need for more studies (large and well designed) before ultrasound assessment of the non-pregnant or pregnant uterus can be introduced into clinical practice to help select women for a trial of labour after caesarean.

REFERENCES

- [1] Fukuda M, Fukuda K, Mochizuki M. Examination of previous caesarean section scars by ultrasound. *Arch Gynecol Obstet* 1988;243(4):221-224.
- [2] Qureshi B, Inafuku K, Oshima K, et al. Ultrasonographic evaluation of lower uterine segment to predict the integrity and quality of caesarean scar during pregnancy: a prospective study. *Tohoku J Exp Med* 1997;183(1):55-65.
- [3] Cheung VY. Sonographic measurement of the lower uterine segment thickness in women with previous caesarean section. *J Obstet Gynaecol Can* 2005;27(7):674-681.
- [4] Rozenberg P, Goffinet F, Phillippe HJ, et al. Ultrasonographic measurement of lower uterine segment to assess risk of defects of scarred uterus. *Lancet* 1996;347(8997):281-284.
- [5] Araki T, Inooka H. The diagnostic value of ultrasonography with reference to previous caesarean section scars during full term pregnancy. *Acta Obstet Gynaecol* 1982;34:738-744.
- [6] Jastrow N, Chaillet N, Roberge S, et al. Sonographic lower uterine segment thickness and risk of uterine scar defect: a systematic review. *J Obstet Gynaecol Can* 2010;32(4):321-327.
- [7] Mandal SC, Lahiri S, Radhika B, et al. Study of role of metformin in management of polycystic ovarian syndrome. *Obstet Gynecol Int J* 2017;6(1):00190.