

Diagnostic Accuracy of Lower Uterine Segment Scar Thickness ≤ 1.6 mm in Prediction of Scar Dehiscence in patients with Previous One LSCS Who are Undergoing Repeat LSCS after Trial of Labour taking Intraoperative findings as Gold Standard

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ABSTRACT

Background: Cesarean section uterine scar dehiscence (CSD) is a rare but notable complication of Lower segment cesarean section (LSCS) surgery. 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 dehiscence. Globally accepted option for assessing the CS scar is transvaginal ultrasonography of the non-pregnant uterus.

Objective: To determine the diagnostic accuracy of lower uterine segment scar thickness ≤ 1.6 mm in the prediction of scar dehiscence in patients with previous one LSCS who are undergoing repeat LSCS after trial of labour taking intraoperative findings as gold standard.

Material and methods: This cross sectional study was conducted in Services Hospital, Lahore for 6 months. The Non probability consecutive sampling technique was used to include women with previous one LSCS at 36-38 weeks were asked to get their TVS done for scar thickness. Women with scar thickness ≤ 1.6 mm and scar thickness > 1.6 mm were identified. Their intraoperative findings of scar dehiscence were confirmed. All the data was entered and analyzed on SPSS version 20.

Results: The mean age of patients was 29.87 ± 6.07 years. The emergency LSCS was done in 599 (49.1%) patients and elective LSCS was done in 621 (50.9%) patients. The sensitivity, specificity & diagnostic accuracy of TVS was 98.31%, 99.05% & 98.69% respectively.

Conclusion: According to our study results the TVS for uterine scar is a very useful and effective tool in the prediction of scar dehiscence in patients with previous one LSCS taking intraoperative findings as gold standard.

Keywords: Transvaginal sonography, TVS, Uterine, Scar, dehiscence, LSCS, Intraoperative

INTRODUCTION

The number of women who have undergone cesarean sections (CS) increases by 1.5 million every year¹. Thus, management of pregnant patients that have previously undergone CS has become routine in delivery rooms worldwide. The safety of vaginal birth after cesarean section (VBAC) has been evaluated in various clinical trials, although the possibility of uterine dehiscence and rupture exists in 0.3 to 3% of cases¹.

Several studies have reported the imminent risk of uterine dehiscence and rupture in women during trial of labor with prior history of lower segment cesarean section (LSCS). As the previous C-section is associated with greater risk of complication during trial of labor so the decision of mode of delivery in next pregnancy is left to the patient.² For the better access of risk of uterine dehiscence and rupture USG measurement of lower uterine segment scar thickness near term is being employed for the last few decades.

During the second half of 20th century, a cesarean section implied that all subsequent pregnancies were very likely to be delivered in the same way. This policy was the result from the fear of catastrophic uterine scar rupture of classical cesarean section, which persisted even after its replacement with lower segment cesarean section (LSCS) without the same basis.

Various prospective studies showed that there is an inverse relationship between scar thickness and risk of scar dehiscence.³ Globally accepted option for assessing the CS scar is transvaginal ultrasonography of the non-pregnant uterus. When compared to the transabdominal approach, the proximity of the transvaginal probe to the pelvic organs enables obtaining high resolution images of the CS scar. Sonographically lower uterine segment consist of echogenic muscularis and mucosa of bladder wall, part of visceral and parietal peritoneum and relatively hypoechoic myometrium⁴⁻⁶.

LUS thickness may work as an excellent predictor of uterine scar defect in women undergoing VBAC. However, as present in ideal cut-off value cannot be recommended⁴.

Uterine scar thickness can be assessed both by transabdominal or transvaginal scan but recent studies revealed that TVS is more reliable in this regard. The optimal cut off value for LUS scar by various studies is found to be 2 to 3.5mm. The positive predictive value for ultrasound measurement was found to be 60.7% while negative predictive value was 100%⁷ while specificity is 88.6% and sensitivity is 77.8%.⁴ Incidence of uterine scar dehiscence is 7.8%.⁶ The optimal cut-off value varied from 1.6 to 3.5mm for full LUS thickness.

The rationale of this study is to determine diagnostic accuracy of LUS scar thickness ≤ 1.6 mm in prediction of scar dehiscence after trial of labour as there are no local studies available and positive predictive value is proportional to magnitude of the disease in the population which is different in different areas.

The objective of the study was to determine the diagnostic accuracy of lower uterine segment scar thickness ≤ 1.6 mm in the prediction of scar dehiscence in patients with previous one LSCS who are undergoing repeat LSCS after trial of labour taking intraoperative findings as gold standard.

MATERIALS AND METHODS

This cross sectional study was conducted in the Department of Gynae Unit, Services Hospital, Lahore for a period of six months from 26-1-2016 to 26-7-2016. Sample size of 1220 patients is calculated with 95% confidence level, 7% margin of error for sensitivity i.e. 77.8% and 5% margin of error for specificity i.e. 88.6% of LUS scar thickness ≤ 1.6 mm and percentage of scar dehiscence 7.8%. Sampling technique used was non probability consecutive sampling

Inclusion Criteria: Pregnant women with singleton pregnancy at term 37-40wks assessed by LMP with previous history of one LSCS with vertex presentation assessed by scan undergoing trial of labor.

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Exclusion Criteria: Women who have previous upper uterine segment incision, inadequate pelvis for trial of labour assessed by clinical pelvimetry, who have absolute indication for LSCS i.e. placenta previa type 4, fetal macrosomia, prev. ≥ 2 LSCS, with H/O previous other uterine surgeries i.e. myomectomy etc. were excluded.

Data collection procedure: After approval from hospital ethical committee, 1220 females fulfilling the selection criteria was enrolled in the study from OPD. Informed consent was acquired. Demographic information was also obtained. All women with previous one LSCS at 36-38 weeks were asked to get their TVS done for scar thickness. Women with scar thickness ≤ 1.6 mm and scar thickness > 1.6 mm were identified. All patients with previous one LSCS who get their repeat LSCS after trial of labour were eligible for the study. Their intraoperative findings of scar dehiscence were confirmed and then it was collaborated with pre-determined sonographic scar thickness. Subperitoneal separation of uterine scar with chorioamniotic membranes visible through peritoneum of LUS on naked eye, intraoperatively. LUS was defined as smallest measurement between amniotic fluid and urine in maternal bladder seen on TVS LUS thickness ≤ 1.6 mm is predictor of scar dehiscence

Data Analysis: Data was entered and analyzed through SPSS version 20. 2x2 table was generated to calculate sensitivity, specificity, positive predictive value, negative predictive value and predictive accuracy of scar thickness ≤ 1.6 mm in the prediction of scar dehiscence by taking intraoperative findings as gold standard.

RESULTS

In our study total 1220 patients participated with mean age of 29.87 ± 6.07 years. There were 254 (20.8%) primiparous while 966 (79.2%) were multiparous. The emergency LSCS was done in 599 (49.1%) patients and elective LSCS was done in 621 (50.9%) patients (Table 1).

The study results showed that the sensitivity of TVS was 98.31% with specificity of 99.05%, PPV value was 98.98%, NPV value was 98.42% and diagnostic accuracy of TVS was 98.69% for diagnosing scar dehiscence taking Intraoperative as gold standard (Table 2)

Table 1: Demographics of patients

N	1220
Age (years)	29.87 ± 6.07
Parity	
Primiparous	254 (20.8%)
Multiparous	966 (79.2%)
Type of LSCS	
Emergency	599 (49.1%)
Elective	621 (50.9%)

Table 2: Accuracy of TVS diagnosis with intraoperative diagnosis

		Intraoperative		Total
		Positive	Negative	
TVS	Positive	580	6	586
	Negative	10	624	634
Total		590	630	1220

Sensitivity = 98.31%, Specificity = 99.05%, PPV = 98.98%, NPV = 98.42%, Diagnostic Accuracy = 98.69%

DISCUSSION

The Cesarean birth rate is rising primarily due to the incidence of elective CSs which accounts for one third of CSs. Sonographic examination of the LUS has been used to diagnose a uterine defect and to determine the degree of LUS thinning in women with previous CSs. The measurement of the LUS thickness prior to the onset of labor may have clinical significance if it can identify the uterine dehiscence⁸.

Uterine dehiscence is known to be asymptomatic and the absence of clinical significance of 'silent' scar dehiscence has been mentioned by Peaceman and Sciarra⁹ and by Petrikovsky¹⁰.

Dehiscence was the most frequently observed primary outcome in the majority of studies. In our study the sensitivity, specificity, PPV, NPV and diagnostic accuracy of TVS for diagnosing scar dehiscence was 98.31%, 99.05%, 98.98%, 98.42% and 98.69% respectively taking Intraoperative as gold standard. A study by Sabaa et al¹¹ resulted that As regards the agreement between both ultrasonic tools and actual measures, the bias of TAS (0.3 mm) was bigger than that of TVS (0.06 mm) and the range of limits of agreement for TAS is wider than that for TVS. Although, the agreement between both ultrasonic tools and actual measures was clinically acceptable.

A study by Asakura et al¹ demonstrated in their study that the sensitivity was 77.8%; specificity 88.6%; positive predictive value 25.9%; negative predictive value 98.7%. Measurement of the lower uterine segment is useful in predicting the absence of dehiscence among gravidas with previous CS. The positive predictive value for ultrasound measurement was found to be 60.7% while negative predictive value was 100%⁵ while specificity is 88.6% and sensitivity is 77.8%⁴.

Another study by Grace Rebekah¹² showed that the sensitivity was 90.9%, specificity was 43.5%, positive predictive value was 12.5%, and negative predictive value was 98.3% at this cutoff for scar rupture or dehiscence. A study by Vincent Y. T. Cheung et al¹³ presented that in the cesarean group, 44 patients (83.0%) had a normal-appearing LUS indistinguishable from that of control groups; 2 patients (3.8%) had an LUS defect suggestive of dehiscence; and 7 patients (13.2%) had thickened areas of increased echogenicity with or without myometrial thinning. One of the 2 patients who had a sonographically suspected LUS defect had confirmed uterine dehiscence during surgery. The prenatal sonographic examination is potentially capable of diagnosing a uterine defect and determining the degree of LUS thinning in patients with previous CS.

Fukuda et al¹⁴ and Suzuki et al¹⁵ using transabdominal sonography without clearly defining the site of measurement, concluded that a wall thickness of 2 mm or less was a potential sign of a uterine defect. Sen et al showed the correlation between TAS and TVS in measuring LUS thickness to be excellent¹⁶. However, a more recent study showed inter-observer agreement to be better when TVS was used¹⁷.

CONCLUSION

According to our study results the TVS for lower uterine segment scar thickness ≤ 1.6 mm is a very useful and effective tool in the prediction of scar dehiscence in patients with previous one LSCS taking intraoperative findings as gold standard.

Conflict of interest: None

REFERENCES

- 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 Labor. J Nippon Med School 2000;67(5):352-6.
- Cheung VY. Sonographic measurement of the lower uterine segment thickness: is it truly predictive of uterine rupture? J Obstet Gynaecol Canada 2008;30(2):148-51.
- Samar DS, Heba AK. Measuring Lower Uterine Segment Thickness using Abdominal USG to predict timing of C-Section in Women with Scarred Uterus at Elwiya Maternity Teaching Hospital. . KCMJ 2013;9(2):9-13.
- Jastrow N, Chaillet N, Roberge S, Morency A-M, Lacasse Y, Bujold E. Sonographic lower uterine segment thickness and risk of uterine scar defect: a systematic review. J Obstet Gynaecol Canada 2010;32(4):321-7.
- Basic E, Basic-Cetkovic V, Kozaric H, Rama A. Ultrasound evaluation of uterine scar after Cesarean section and next birth. Med Arch 2012;66:41.

6. Jadasi N, Sitichand P. Intraoperative complications in patients taking trial of labour after cesarean section. *JPMC* 2009.
7. Basic E, Basic-Cetkovic V, Kozaric H, Rama A. Ultrasound evaluation of uterine scar after cesarean section. *Acta Informatica Medica* 2012;20(3):149.
8. Mohammed ABF, Al-Moghazi DA, Hamdy MT, Mohammed EM. Ultrasonographic evaluation of lower uterine segment thickness in pregnant women with previous cesarean section. *Middle East Fertil Soc J* 2010;15(3):188-93.
9. Peaceman A, Sciarra J. Encouraging trials of labour for patients with previous caesarean birth. *The Lancet* 1996;347(8997):278.
10. Petrikovsky B. Rupture of the scarred uterus: prediction and diagnosis. *The Lancet* 1996;347(9004):838-9.
11. Haitham Abd El-mohsen Sabaa, Ahmed Khairy Makled, Khaled Hassan Swedan, Amr Ahmed Abo-Alyazid Ramadan. Diagnostic Accuracy of TransAbdominal Versus Trans-Vaginal 2-Dimensional Ultrasound in Assessment of Lower Uterine Segment Thickness in Women with Previous One Cesarean Section and its Correlation with the Actual Thickness during Cesarean Section. *Med J Obstet Gynecol* 2015;3(1):1052.
12. Thomas A, Rebekah G, Vijayaselvi R, Jose R. Transvaginal Ultrasonographic Measurement of Lower Uterine Segment in Term Pregnant Patients with Previous Cesarean Section. *Open J Obstet Gynecol* 2015;5(11):646.
13. Cheung VY, Constantinescu OC, Ahluwalia BS. Sonographic evaluation of the lower uterine segment in patients with previous cesarean delivery. *J Ultrasound Med* 2004;23(11):1441-7.
14. Fukuda M, Fukuda K, Mochizuki M. Examination of previous caesarean section scars by ultrasound. *Arch Gynecol Obstet* 1988;243(4):221-4.
15. Suzuki S, Sawa R, Yoneyama Y, Asakura H, Araki T. Preoperative diagnosis of dehiscence of the lower uterine segment in patients with a single previous Caesarean section. *Austr N Z J Obstet Gynaecol* 2000;40(4):402-4.
16. Sen S, Malik S, Salhan S. Ultrasonographic evaluation of lower uterine segment thickness in patients of previous cesarean section. *Int J Gynecol Obstet* 2004;87(3):215-9.
17. Jastrow N, Antonelli E, Robyr R, Irion O, Boulvain M. Inter- and intraobserver variability in sonographic measurement of the lower uterine segment after a previous Cesarean section. *Ultrasound Obstet Gynecol* 2006;27(4):420-4