

## Predicting Uterine Rupture by Uterine Thickness Via Sonogram

Eman Mustafa Hasson\*, Eman Faraj Khayat

Al-Diwaniyah Teaching Hospital For Obstetric and Pediatrics

\*Corresponding author: Eman Mustafa Hasson

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### Abstract

**Objective:** To evaluate by Ultrasound the lower uterine segment thickness of women with previous Cesarean section delivery determine critical above with safe vaginal delivery is predictable. **Patient and Method:** The study done in AL-Zahraa Teaching Hospital in AL-Najaf; attachment of Kufa university department of Obstetric and Gynecology. Kufa, Najaf. Among 200 patients with previous lower segment Cesarean section, Ahistory taken including gestational age, the interval between the pregnancy and previous Cesarean section, causes of previous Cesarean section and if it is emergency or elective. Ultrasound finding for this pregnancy including gestational age, lower segment uterine thickness. **Result:** In this study successful vaginal birth after Cesarean section = (59 %) elective second Cesarean section delivery (10 %) . failed trial of labour (30 %) uterine rupture scar ( 1% ) that is mean only two patients get rupture uterus among 200 patients. **Conclusion:** Ultra sound evolution permit better assessment of risk of scar complication intra partum could allow for safer management delivery.

**Keywords:** Ultrasound, Cesarean section, Uterine rupture.

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## INTRODUCTION

Sonographic evaluation of the LUS can determine the degree of LUS thinning and identify a dehiscence LUS (defined as subperitoneal separation of the uterine scar, with chorioamniotic membrane visible through the peritoneum of the LUS). Although the morbidity of dehiscence is clinically much less than rupture, prenatal identification of an extremely thin or a dehiscence LUS is believed to be predictive of subsequent uterine rupture during labour [1].

Caesarean section is one of the frequently performed surgical procedures in current obstetrics [2]. The caesarean section rate has increased to an alarming extent in the last decades [3]. Repeat caesarean section is the signal most common contributor to this rise or high incidence of caesarean section [4].

Trial of vaginal birth after caesarean section (VBAC) represents one of the most significant changes in obstetric practice in the recent time. Because of the trial of VBAC, it is now advocated that women without contraindications to vaginal delivery but with one previous lower segment caesarean section should be offered trial of vaginal birth after caesarean section [5].

Induction/augmentation of labour are not absolutely contraindicated in trial of VBAC. However, women with history of previous caesarean section who

require induction/augmentation have a higher rate of repeat caesarean section compared with similar women with spontaneous labour [6]. A dramatic rise in caesarean deliveries have been occurring over the past three decades the old myth.

“Once a caesarean always a caesarean “ is no longer acceptable hence there is a change world over leading to on increased practice of attempting vaginal birth after caesarean delivery as compared to repeat elective caesarean delivery include lower rates of postpartum fever, wound infections, maternal discomfort, length of hospital stay, need of blood transfusion and lower rates of hysterectomy [7].

A successful vaginal birth with previous one caesarean section includes several factors. Out of these, favorable mortality, Bishop's score, BMI < 20, prior vaginal delivery weight of baby < 3.5 kg and non-recurrent indication for previous section are the most common [8]. Maternal age also plays an important role and age less than 40 years is considered to be a favorable factor [9]. However, trial of labour is associated with a greater risk of uterine rupture and hence increased incidence of perinatal death [10]. In Pakistan, large scale data is lacking on safety and outcome of trial of labour.

Two retrospective studies Successful VBAC included patients attempting a trial of labor and

succeeding in vaginal delivery. Failed VBAC occurred in patients who were deemed appropriate for trial of labor and who attempted vaginal delivery but, for whatever reason, ended with a repeat cesarean. The elective repeat cesarean group was defined as women who were deemed inappropriate for trial of labor for whatever reason and who were elected to undergo surgical delivery. These criteria were established as reasonable by the clinical maternal-fetal medicine specialists at the University of Chicago and were also within The American College of Obstetricians and Gynecologists guidelines for VBAC candidates [11].

To better assessment 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 assumption for the management of women with prior CS may increase safety during labour by selecting women with the lower risk of uterine rupture. However, while a large prospective study demonstrated that a full LUS thickness of order 3.5 mm had a strong negative predictive value, the best cut-off values and the best measuring technique remain controversial [12].

## PATIENTS AND METHOD

This study was conducted at Al Zahra 'a Teaching Hospital attached to Kufa University. Prospective observation study of 200 antenatal women during antenatal period who had history of previous one C/S delivery for non-recurrent causes. Cases were collected from outpatient and from ward admitted for obstetrical causes. From all collected cases a proper history is taken and complete physical examination is done to them. Their age ranged between 16-38 years with a mean age of 27 years, their gravida ranged G2-G10 with a mean gravida of G6 and also the time interval between presenting pregnancy and previous c/s was ranged in 2-156 months with a mean of 79 months.

All cases were selected with negative history of previous uterine surgery in form of D & C;

myomectomy; metroplasty; or uterine anomalies and cases with previous c/s not due to recurrent causes. The thickness of c/s scar was measured by Trans abdominal ultra sound in millimeter, 3.5 mm in thickness regarded as good normal scar, Less than 3.5 mm thickness regarded as abnormal [13].

Trans abdominal ultra sound (TAS) was done to all cases to evaluate lower uterine segment, by using LOGIQ a 200 with curvilinear probe frequency 3.5 - 5 MHZ.

All cases were assessed for lower uterine segment thickness at (37-38) week gestation, cases are grouped into two groups: 1<sup>st</sup> group of uterine segment thickness more than 3.5 mm was (197 cases) while the 2<sup>nd</sup> group with less than 3.5 mm was (3 cases). All cases were followed in labor ward and in theater for evidence of rupture uterus and fetal outcome.

## RESULTS

Cases were analyzed to two groups: 1<sup>st</sup> group show more than 3.5 thickness of lower uterine segment contain About 197 cases, 20 of the above cases were undergo elective C/S due to obstetrical indication while 177 gave them trial of labor, about 118 of them delivered successful vaginal delivery, while 59 delivered by emergency C/S for obstetrical causes. As shown in Table-1.

The 2<sup>nd</sup> group with Less than 3.5 thickness of lower uterine segment include 3 cases one of them 3.4mm undergo elective C/S, and one with 2.9mm undergo emergency C/S for rupture uterus, and the last one show 2.5mm delivered by emergency C/S for failure of progress of labor. As shown in table 1, and 2. the result in table 1, shows only two patients get rupture scar within 200 group of patients, thinking of rupture scar was measured antinatally one is 2.9 mm, while the other is 2.5 mm that is mean there is a relation between the lower uterine segment thickness measured by U/S and rupture uterus.

**Table-1: Shows the relation between type of labor and thickness of lower uterine segment**

Type of labour	More than 3.5 mm N=197	Less than 3.5 mm N=3	P value
Elective C/S	20 = 10.15 %	1 = 33.33 %	0.04801
Trail of labour	177= 89.847%	2 = 66.66 %	
Successful trail of labour	118 = 66.66 %	zero	
Emergency C/S	59 = 33.33 %	2 = 66.66 %	
Rupture uterus	zero	2 = 66.66 %	
Neonates	One dead due to congenital a nomalies	1 dead (rupture uterus)	

Table-2 shows only two patient undergo rupture scar within 200 group patient, and that is mean

there is significant relationship between thinning of lower segment and rupture uterus.

**Table-2: Relation between lower uterine segment thickness and rupture of scar among 200**

Thickness of lower segment by U/S (mm)	Frequency	Percent	No. of rupture
Greater than 3.5	197	98.5	0
Less than 3.5	3	1.5	2

Table-3 show that only two neonates were dead one of them due to rupture uterus while other one

was delivered by normal vaginal delivery but with congenital anomaly.

**Table-5: shows the comparison between the viability of neonate and lower uterine segment thickness**

viability	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	P value
				Lower Bound	Upper Bound			
viable active	4.9459	.95860	.06847	4.8109	5.0810	3.30	13.50	0.319
dead	4.0000	2.12132	1.50000	15.0593	23.0593	2.50	5.50	

## DISCUSSION

Sonography permits accurate assessment of the LUS thickness in women with previous CS and can potentially be used to predict the risk of uterine rupture during trial of vaginal birth [14]. Uterine rupture is a recognized complication of a trial of VBAC. In a recent guideline on VBAC, the Society of Obstetricians and Gynaecologists of Canada recommended that, in the absence of any contraindications, a woman with one previous transverse lower segment CS should be offered a trial of labour with appropriate discussion of maternal and perinatal risks and benefits. At present, there are still no reliable methods for predicting the risk of uterine rupture in women attempting VBAC. Sonographic measurement of the LUS has been used in estimating the risk of uterine rupture, but the value of using this measurement in the management of VBAC remains controversial. In Canada, it is still not a popular practice to use LUS measurement in the management of women with previous CS. Our findings indicate that there is a strong association between the degree of LUS thinning measured near term and the risk of uterine scar defect at birth [15].

In our study give a results of number of successful vaginal birth after C/S is (59 %) which gives significant relation to world wide percentage of (70 – 75%) [16]. Number of rupture scar in all our cases are two.

We found there was a significant statistical agreement between current study and study done by Rozenberg P [17]; which give a result of successful vaginal birth after C/S of 72% this little deference in percentage because may be due to the total number of patient in the study of Rozenberg p is more (642) is more than our study 200 cases.

On the other hand our study is not agree with a study done in (2010) in Al-Zahraa hospital which give result of uterine rupture after one C/S of 3.1 % among 224 group of patient while our study give a result of uterine rupture after one C/S 1 % this may be due to

Asymptomatic rupture uterus and explained the observation and facility of such cases now become much better than before [18].

On the other hand Qureshif study not agree with our study they give a result of successful trial of vaginal birth after C/S =15 (34.9%) but among little number of group of patients of 43 [19].

A study in Kuffa university in 2011 gives a result of successful V.B.AC = 25.6% in group of 226 patients this not agree with our study may be because of high number of elective C/S in her study and the trial of labour not according to scar thickness [20]. Phelan *et al.*, [21] reported 0.7% symptomatic rupture this among 140 women this agree with our study he concluded trial of labour is acceptable option.

## CONCLUSION

Ultra sound evolution permit better assessment of risk of scar complication intra partum could allow for safer management delivery. Another benefit of this study was that it will promote vaginal birth in patient with previous C/S and hence reducing complications associated with C/S.

## REFERENCES

- Asakura, H., Nakai, A., Ishikawa, G., Suzuki, S., & Araki, T. (2000). Prediction of uterine dehiscence by measuring Lower uterine segment thickness prior to the onset of labor. *Journal of Nippon Medical School*, 67(5), 352-356.
- Aisien, A. O., & Oronsaye, A. U. (2004). Vaginal birth after one previous caesarean section in a tertiary institution in Nigeria. *Journal of obstetrics and gynaecology*, 24(8), 886-890.
- MacDorman, M. F., Menacker, F., & Declercq, E. (2008). Cesarean birth in the United States: epidemiology, trends, and outcomes. *Clinics in perinatology*, 35(2), 293-307.
- US Department of Health and Human Services. (1991). Rates of cesarean delivery United States. *MMWR*, 41, 285-289.

5. Society of Obstetricians and Gynaecologists of Canada. (2005). SOGC clinical practice guidelines. Guidelines for vaginal birth after previous caesarean birth. Number 155 (Replaces guideline Number 147), February 2005. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics*, 89(3), 319.
6. McDonagh, M. S., Osterweil, P., & Guise, J. M. (2005). The benefits and risks of inducing labour in patients with prior caesarean delivery: a systematic review. *BJOG: An International Journal of Obstetrics & Gynaecology*, 112(8), 1007-1015.
7. Rageth, J. C., Juzi, C., & Grossenbacher, H. (1999). Delivery after previous cesarean: a risk evaluation. *Obstetrics & Gynecology*, 93(3), 332-337.
8. Hook, B., Kiwi, R., Amini, S. B., Fanaroff, A., & Hack, M. (1997). Neonatal morbidity after elective repeat cesarean section and trial of labor. *Pediatrics*, 100(3), 348-353.
9. Scott, J. R. (1991). Mandatory trial of labor after cesarean delivery: an alternative viewpoint. *Obstetrics and gynecology*, 77(6), 811-814.
10. Jones, R. O., Nagashima, A. W., Hartnett-Goodman, M. M., & Goodlin, R. C. (1991). Rupture of low transverse cesarean scars during trial of labor. *Obstetrics and gynecology*, 77(6), 815-817.
11. Adamu, R. M., & McCarthy, M. Y. (2001). Vaginal birth after caesarean delivery in Pakistan setting, *International Journal of Obstetrics and gynecology*, 98(3): 227-231.
12. Ghada, M., Mansour, M. D., Sherif, F., EL-Mekawy, M. D., Albahaie, G. M., Asmaa M. S., & Ali, H. Cesarean Section Scar Depiction By TransvaginalUltyasound in Non Pregnant State, MsC Department of Obstetrics and Gynecology Ain shams University. <http://www.sciencepub.net/report>.
13. Rozenberg, P., Goffinet, F., Philippe, H. J., & Nisand, I. (1996). Ultrasonographic measurement of lower uterine segment to assess risk of defects of scarred uterus. *The Lancet*, 347(8997), 281-284.
14. Cheung, V. Y. (2005). Sonographic measurement of the lower uterine segment thickness in women with previous caesarean section. *Journal of obstetrics and gynaecology Canada*, 27(7), 674-681.
15. Brill, Y., Kingdom, J., Thomas, J., Fraser, W., Milne, J. K., Thomas, M., & Windrim, R. (2003). The management of VBAC at term: a survey of Canadian obstetricians. *Journal of Obstetrics and Gynaecology Canada*, 25(4), 300-310.
16. Essential of Gynecology and Obstetrics, Fifth edition.
17. Rozenberg, P., Goffinet, F., Philippe, H. J., & Nisand, I. (1996). Ultrasonographic measurement of lower uterine segment to assess risk of defects of scarred uterus. *The Lancet*, 347(8997), 281-284.
18. Jastrow, N., Roberge, S., Gauthier, R. J., Laroche, L., Duperron, L., Brassard, N., & Bujold, E. (2010). Effect of birth weight on adverse obstetric outcomes in vaginal birth after cesarean delivery. *Obstetrics & Gynecology*, 115(2), 338-343.
19. Qureshi, B., Inafuku, K., Oshima, K., Masamoto, H., & Kanazawa, K. (1997). Ultrasonographic evaluation of lower uterine segment to predict the integrity and quality of cesarean scar during pregnancy: a prospective study. *The Tohoku journal of experimental medicine*, 183(1), 55-65.
20. Ebtihal, J. A. A. (2011). Successful vaginal birth after one caesarian section and material out come By College of medicine – university of Kufa.
21. Phelan, J. P., Eglinton, G. S., Horenstein, J. M., Clark, S. L., & Yeh, S. (1984). Previous cesarean birth. Trial of labor in women with macrosomic infants. *The Journal of reproductive medicine*, 29(1), 36-40.