TRANSVAGINAL SONOGRAPHIC ASSESSMENT OF CESAREAN SECTION SCAR

Thesis
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ABSTRACT

Objective: transvaginal sonography has been implicated to measure the lower uterine segment thickness prior to the onset of labour, this might have an impact on decision making about the mode of delivery.

Methods: The lower uterine segment thickness was measured by transvaginal sonography (36 weeks – 38 weeks gestation) in 100 pregnant patients divided into four groups each of them contains 25 patients with previous one CS, previous two CS, previous VBAC and multiparas with normal vaginal delivery, for every patient, the mode of delivery was documented.

Results: The mean scar thickness as measured by transvaginal sonography is 3.2mm ±0.7 mm. Out of 50 patients studied (group 1&group 3), 15 patients (30%) delivered by Cesarean section while 35 patients (70%) had delivered by VBAC. There was significant correlation between the sonographic measurement of LUS thickness using transvaginal sonography (p value= 0.001).The scar thickness in the third trimester (36-38 weeks) had a significant relation with the mode of delivery. The cut-off value for the thickness of lower uterine segment was 3.0 mm as calculated by the receiver operating characteristic curve .The sensitivity was 82.9% , specificity 93.3% , positive predictive value 96.7% ,negative predictive value 70%.

Conclusions: measurement of the lower uterine segment thickness is useful in predicting the cases undergoing TOL after previous CS. If the thickness of the lower uterine segment is more than 3.0 mm, the possibility of successful VBAC is high.

Key words: previous cesarean section, lower uterine segment& VBAC.

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LIST OF ABBREVIATIONS

ACOG	: American College of Obstetrics and Gynaecology.
BMI	: Body Mass Index.
CDMR	: Cesarean Delivery on Maternal Request.
CS	: Cesarean Section.
CPD	: Cephalopelvic disproportion.
ECS	: Elective Cesarean Section.
ERCD	: Elective Repeat Cesarean Delivery.
FHR	: Fetal Heart Rate.
IOL	: Induction Of Labour .
LUS	: Lower Uterine Segment.
NIH	: National Institutes of Health.
NPV	: Negative Predictive Value.
NS	: Non Significant.
OR	: Odds Ratio.
PCDS	: Previous cesarean scar defects.
PGE2	: Prostaglandin E2.
PPV	: Positive Predictive Value.
PROM	: Premature Rupture Of Membrane.
RCOG	: Royal College of Obstetricians and Gynaecologists.
SOGC	: Society of Obstetricians and Gynaecologists of Canada.
TAS	: Transabdominal Sonography.
TOL	: Trial of Labour.
TOLAC	: Trial of Labour after Cesarean section.
TVS	: Transvaginal Sonography
VBAC	: Vaginal Birth after Cesarean Delivery.
HTN	: Hypertension

INTRODUCTION

The cesarean delivery rate has continued to increase over the past several years ***(Martin et al, 2002)***. One of the most common indications for cesarean delivery is previous cesarean section ***(Chanrachakul et al, 2000)***.

The maternal and neonatal morbidity risk increased when trial of labour after cesarean section (TOLAC) fails which emphasizes the importance of careful case selection. Also the risks of uterine rupture and neonatal mortality were significantly increased ***(Biswas, 2003)***.

However, a trial of vaginal birth after previous cesarean section (CS) was reported to be a safe and practical method to reduce rate of cesarean section. A non-recurrent indication for previous cesarean section, such as breech presentation or fetal distress is associated with a much higher successful rate of VBAC than recurrent indications such as cephalopelvic disproportion (CPD). Even with history of CPD; two thirds of women will have successful VBAC. Also prior vaginal deliveries are excellent indicators of successful VBAC especially if vaginal delivery follows the prior cesarean section ***(Brill et al, 2003)***.

Unsecure prediction of the integrity of the scarred LUS during labour appears to be one of the reasons for high repeat cesarean section rates ***(Lydon-Rochelle et al, 2001)*.** Several methods ranging from postoperative echographic evaluation of

uterine wound, interval hysterography and magnetic resonance imaging to amniography have been employed to assess the integrity of scarred LUS. Several recent reports suggest that sonographic evaluation of LUS can be used effectively to assess its integrity to predict the risk of intrapartum uterine rupture ***(Bujold et al, 2009)*.**

Different opinions are expressed regarding the period in pregnancy when the ultrasound assessment can be carried out with regard to the cut off value for LUS thickness. *About timing of sonographic assessment*, Quereshi and the coworkers began assessment from as early as 16th week of gestation in their study ***(Quereshi et al, 1997)***. In contrast, Michaels and the coworker thought it is advantageous to assess between 28 and 36 weeks, since it allowed for adequate LUS development, and avoided problems of diagnosis when the presenting part was deep in pelvis and when the amniotic fluid volume was physiologically reduced ***(Michaels et al, 1988)*.**

The Study had showed that scar dehiscence is directly related to the sonographically-assessed thickness of the lower uterine segment (LUS) at between 37 and 40 weeks of pregnancy ***(Sen et al. 2004).***

Several studies using various methods have been conducted to evaluate the correlation of lower uterine segment measurement with the risk of uterine rupture or dehiscence with relative success.

In some studies, the sonographers measured the entire lower uterine segment by transabdominal ultrasound ***(Asakura et al,2000)&(Bujold et al,2010)*** while in another study only the middle muscle layer was assessed using transvaginal sonography ***(Gotoh et al,2000)*** and some studies used both methods together ***(Martin et al., 2009)&(cheung,2005).***

Hebisch and the coworkers, showed that TVS provided more accurate information about the condition of the scarred LUS than magnetic resonance imaging. The main factors that limit an increased use of TVS for assessment of LUS thickness are discomfort and difficulty in performing the procedure in women at term. In addition, it requires greater expertise and has a longer learning curve **(*Hebisch et al., 1994*).**

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AIM OF WORK

The aim of this study is to assess the accuracy of trans-vaginal ultrasound to evaluate the integrity and thickness of the uterine scar in pregnant patients with history of previous cesarean section. This might have an impact on decision- making about the mode of delivery.

CESAREAN DELIVERY

Definition

Cesarean delivery is defined as the delivery of a fetus through surgical incisions made through the abdominal wall (laparotomy) and the uterine wall (hysterotomy) ***(Joy et al, 2014).***

Historical Background

The origin of the term cesarean is obscure, and two principal explanations have been suggested.

In the first, according to legend, Julius Caesar was born in this manner, with the result that the procedure became known as the Caesarean operation. ***(Cunningham et al, 2010)***.

*The second explanation*s that the word caesarean was derived sometime in the middle Ages from the Latin verb caedere, to cut. This explanation seems most logical, but exactly when it was first applied to the operation is uncertain. Because section is derived from the Latin verb seco, which also means cut, the term cesarean section seems tautological-thus cesarean delivery issued ***(Cunningham et al, 2010).***

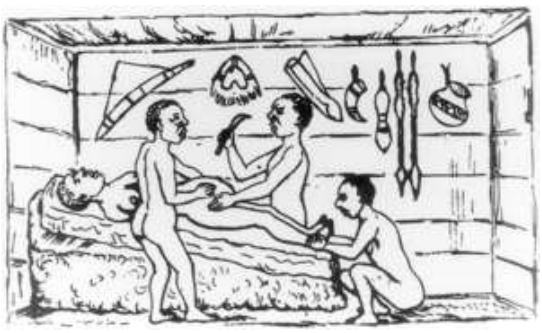

Fig. (1): Successful caesarean section performed by indigenous healers in Kahura, Uganda. As observed by R. W. Felkin in 1879. (Quoted from the National Library of Medicine. Cesarean Section a brief history on line).