



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم



MONA MAGHRABY



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم



شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



MONA MAGHRABY



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات



يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



MONA MAGHRABY

**Comparison between Transabdominal and
Transvaginal Sonographic Assessment of
Lower Uterine Segment at Term in Women
with Previous Cesarean Delivery**

A Thesis

Submitted for partial fulfillment of Master degree
in Obstetrics & Gynecology

By

Mahmoud Mohammed El Masry Abd Allah

M.B.B.Ch, Faculty of Medicine – Minia University (2012)
Resident of Obstetrics & Gynecology, Beni Mazar General Hospital

Under Supervision of

Prof. Dr. Helmy Motawea El Sayed

Professor of Obstetrics and Gynecology
Faculty of Medicine, Ain Shams University

Dr. Alaa Sayed Hassanin

Assistant Professor of Obstetrics and Gynecology
Faculty of Medicine, Ain Shams University

**Faculty of Medicine
Ain Shams University
2021**

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

لسببائك لا علم لنا
إلا ما علمتنا إنك أنت
العليم العظيم

صدق الله العظيم

سورة البقرة الآية: ٣٢



Acknowledgments

*First and foremost, I feel always indebted to **Allah**, the **Most Beneficent** and **Merciful**, Who gave me the strength to accomplish this work,*

*My deepest gratitude to my supervisor, **Prof. Dr. Helmy Motawea El Sayed**, Professor of Obstetrics and Gynecology, Faculty of Medicine, Ain Shams University, for his valuable guidance and expert supervision, in addition to his great deal of support and encouragement. I really have the honor to complete this work under his supervision.*

*I must express my deepest thanks to my **Dr. Alaa Sayed Hassanin**, Lecturer of Obstetrics and Gynecology, Faculty of Medicine, Ain Shams University for guiding me throughout this work and for granting me much of her time. I greatly appreciate her efforts.*

*Special thanks to my **Parents, my Wife** and all my **Family** members for their continuous encouragement, enduring me and standing by me.*

*✍ **Mahmoud Mohammed El Masry Abd Allah***

List of Contents

<i>Subject</i>	<i>Page No.</i>
List of Abbreviations.....	i
List of Tables.....	iii
List of Figures	iv
Introduction	1
Aim of the Work.....	4
Review of Literature	
Cesarean Section	5
Complications of cesarean section	25
Role of Ultrasound in assessment of Cesarean Section Scar.....	45
Patients and Methods.....	55
Results.....	63
Discussion	70
Summary	79
Conclusions	83
References	85
Arabic Summary	—

List of Abbreviations

<i>Abbr.</i>	<i>Full-term</i>
ACOG	American Collage of Obstetricians and Gynecologists
CS	Cesarean section
CSD	Cesarean scar defect
IUS	Lower uterine segment
SSI	Surgical site infection
VTE	Venous thromboembolism
MEWC	Maternal early warning criteria
MEOWS	Maternal early obstetric warning system
MFMU	Maternal fetal medicine unit
EDD	Expected date of delivery
GA	Gestational age
MRI	Magnetic Resonance imaging
SD	Standard deviation
SIS	Saline infusion sonohysterography
ERCS	Elective repeated cesarean section
PRCD	Planned repeated cesaerean delivery
TOLAC	Trial of labor after cesaerean section
TAUS	Transabdominal ultrasonography
TVUS	Transvaginal ultrasonography.
VBAC	Vaginal birth after cesarean section
HSG	Hysterosalpingography
WHO	World Health Organization

List of Tables

Table No.	Title	Page No.
Table (1):	Descriptive data of population.....	63
Table (2):	Comparison between the actual intraoperative measurements and these of TVS plus TAS in all the study cases.....	64
Table (3):	Comparison between TVS and TAS regarding to sensitivity and specificity.....	65
Table (4):	Comparison between TVS and TAS regarding to sensitivity and specificity.....	65
Table (5):	Comparison between TVS and TAS regarding to sensitivity and specificity.....	66
Table (6):	Receiver operating characteristics curve for prediction of scar dehiscence using transvaginal ultrasound measurement	67
Table (7):	Receiver operating characteristics curve for prediction of scar dehiscence using transabdominal ultrasound measurement	68
Table (8):	Correlation between inter-delivery interval and actual measurement of lower uterine segment thickness.....	69

List of Figures

Figure No.	Title	Page No.
Figure (1):	Incisions for caesarean section.....	5
Figure (2):	(a) The caesarean scar defect (CSD) in contact with the bladder was visualized by transvaginal ultrasound (TVUS) examination	33
Figure (3):	Cesarean scar defect, or niche, at the site of previous cesarean delivery hysterotomy	34
Figure (4):	Hysteroscopic view of a cesarean scar defect. Note the outpouching into the anterior lower uterine segment.....	35
Figure (5):	Ultrasonic view of a cesarean scar defect	37
Figure (6):	Laparoscopic view of cesarean scar defect	39
Figure (7):	Laparoscopic view with cervical dilator	40
Figure (8):	Bladder dissection	40
Figure (9):	Use of a cervical dilator	41
Figure (10):	Excised cesarean scar defect	41
Figure (11):	Laparoscopic view following repair	42
Figure (12):	Views following repair of cesarean scar defect.....	43
Figure (13):	Cesarean scar defect.....	46

Figure (14): A 35-year-old woman underwent hysterosalpingography for infertility after a previous cesarean delivery CSD is detected as a leakage of contrast from endometrial cavity into a defect of the myometrium at the location of the previous C-section.....	47
Figure (15): A hysterosalpingography	49
Figure (16): A 40-year-old woman underwent to MR for abnormal uterine bleeding. CSD is detected on T2WI as a myometrium defect with apex pointing anteriorly, located at the anterior isthmus	49
Figure (17): CSD classification and calculation of remaining myometrium.....	50
Figure (18): Anteverted uterus with white echogenic line extending from the uterine cavity to the edge of the myometrium anteriorly.....	52
Figure (19): Retroverted uterus with intact CS	53
Figure (20): The probe is not within the anterior fornix providing a limited view of the CS	54
Figure (21): Receiver operating characteristics curve for prediction of scar dehiscence using transvaginal ultrasound measurement.....	67
Figure (22): Receiver operating characteristics curve for prediction of scar dehiscence using transabdominal ultrasound measurement.....	68

Figure (23): Correlation between inter-delivery interval and actual measurement of lower uterine segment thickness	69
---	----

Introduction

Caesarean section (CS) rates have increased over recent years and according to data from 150 countries, current rates range from 6% to 27.2% (*Betra'n et al., 2016*). Accordingly, the number of CS complications has increased (*Gregory et al., 2012*).

Among early complications postpartum haemorrhage, obstetric hysterectomy due to uterine rupture or atony, urological complications, thromboembolic complications and amniotic fluid embolism may occur (*Gregory et al., 2012*).

Late complications after CS include abdominal pain caused by adhesions, caesarean scar, endometriosis, ectopic pregnancy, caesarean scar defect (CSD), abnormal placenta implantation and even mortality (*Sholapurkar, 2018*).

First described in 1995 following examinations of myometrium samples after hysterectomy in patients who had undergone CS, a caesarean scar defect (CSD) may form at the site of hysterotomy on the anterior wall of the uterine isthmus (*Morris, 1995*).

Improper healing of the caesarean incision leads to thinning of the anterior uterine wall, which creates an indentation and fluid-filled pouch at the CS site (*Bij et al., 2011*).

The complication is also known as uterine scar defect, caesarean scar syndrome, diverticulum, sacculatum, isthmocele, scar pouch or niche(*Dosedla and Calda, 2017*).

The type of surgical technique used for uterine closure has been proposed as an important factor in the formation of CSD (*Sholapurkar, 2018*).

Other factors such as prolonged labour, cervical dilatation >5cm before CS, oxytocin, retroverted uterus, low incision of the uterus have also been suggested as being responsible for the abnormal healing of the caesarean scar(*Vikhareva Osser and Valentin, 2010*).

The CSD may be asymptomatic or manifest with clinical symptoms including metrorrhagia (64%), dysmenorrhea (53%), chronic pelvic pain (40%), infertility and dyspareunia (18%)(*Wang et al., 2009*).

CSD may expand and lead to scar dehiscence or uterine rupture in a subsequent pregnancy as well as result in scar pregnancies and abnormal placentae(*Donnez et al., 2017*).

Ultrasound examination with the possible use of saline infused sonohysterography has been used in the diagnosis of CSD(*Uhar et al., 2015*).

One classification system for CSD was based on the shape of the niche detected from ultrasound findings (*Bij et al., 2011*).

The niche was categorized according to its shape as follows: triangle, semicircle, rectangle, circle, droplet, inclusion cysts. Using this system, investigators found semi-circular and triangular niches were the most common of the six shapes (*Bij et al., 2011*).

Although, there are no current guidelines for the management of CSD, this study will compare between trans-abdominal and transvaginal ultrasound in assessment of the LUS thickness at term pregnancy, in comparison with manual caliper measurements at cesarean delivery and find out predictive value of LUS thickness measurement in assessing integrity of LUS in women with previous cesarean delivery.