DETECTION OF UTERINE SCAR AND ITS DEFECT AFTER CESAREAN SECTION BY TRANSVAGINAL ULTRASOUND

Thesis

Submitted for the Partial fulfillment
of Master Degree in Obstetrics and Gynecology

Presented By

Asmaa Haggag Aly

M.B., B.Ch.
South Valley University (2002)

Under Supervision of

Prof. Dr./ Yasser Galal Mostafa Albahaie

Professor of Obstetrics and Gynecology
Faculty of Medicine
Ain Shams University

Dr./ Sherif Fathi El-Mekkawi

Lecturer of Obstetrics and Gynecology
Faculty of Medicine
Ain Shams University

Dr./Ghada Mahmoud Mansour

Fellow of Obstetrics and Gynecology
Faculty of Medicine
Ain Shams University

Faculty of Medicine
Ain Shams University
2009


بسم الله الرحمن الرحيم
قَالُوا سُبْحَانَكَ لاَ عِلْمَ لَنَا
إِلاَّ مَا عَلَّمْتَنَا إِنَّكَ أَنتَ الْعَلِيمُ
الْحَكِيمُ
صدق الله العظيم
سورة البقرة الآية

Acknowledgment

First of all, I wish to express my sincere thanks to ***GOD*** *for his care and generosity throughout my life.*

I would like to express my sincere appreciation and my deep gratitude to Prof. Dr. Yasser Galal Mostafa Albahaie*, Professor of Obstetrics and Gynecology, Ain Shams University for his faithful supervision and guidance.*

I am also deeply indebted to Prof. Dr. Sherif Fathi El-Mekkawi, *Lecturer of Obstetrics and Gynecology, Ain Shams University for his great support throughout the whole work.*

I would like to express my great thanks to Dr. Ghada Mahmoud Mansour, *Fellow of Obstetrics and Gynecology, Ain Shams University for the tremendous effort she has done in the meticulous revision of this work.*

Many thanks to my lovely family for their meticulous support to complete this work.

Asmaa Haggag

List of Content

List of Figures

List of Tables

List of Tables (Cont…)

List of Abbreviations

ACOG	*American Collage of Obstetricians and Gynecologists*
ALARA	*As low as reasonably achievable*
AORN	*Association of Operating Room Nurses*
BFGF	*Basic Fibroblast Growth Factor*
CI	*Confidence Interval*
Cm	*Centimeter*
CS	*Cesarean section*
CTG	*Connective Tissue Growth Factor*
FHR	*Fetal heart rate*
Gm	*Gram*
Hz	*Hertz*
IUD	*Intrauterine device*
KHz	*KiloHertz*
L	*Liter*
LUS	*Lower uterine segment*
Mgm	*Milligram*
MHz	*Mega Hertz*
Min	*Minute*
mlU	*Milli international unit*
Mm	*Millimeter*
MRI	*Magnetic Resonance imaging*
PDGF	*Platelet-Derived Growth Factor*
PG	*Prostaglandins*
ROCOG	*Royal College of Obstetric and Gynecology*

RR	*Relative risk*
SCSH	*Saline contrast sonohysterography*
SD	*Standard deviation*
SOGC	*Society of Obstetricians and Gynecologists of Canada*
TAS	*Transabdominal sonography*
TGF-β	*Transforming Growth Factor-beta*
TNF-α	*Tumor Necrosis Factor-alfa*
TOLAC	*Trial of labor after cesarean section*
TVS	*Transvaginal sonography*
U/S	*Ultrasound*
UK	*United Kingdom*
USA	*United States of America*
VBAC	*Vaginal birth after cesarean section*
VEGF	*Vascular Endothelial Growth Factor*
Vs	*Versus*
WHO	*World Health Organization*

INTRODUCTION

The number of deliveries by Cesarean section has been increasing steadily worldwide in recent decades. Although it is often assumed that Cesarean section improves neonatal outcomes, there is no hard scientific evidence to support this. The safety of Cesarean section, however, has increased owing to improvements in surgical and anesthetic techniques, increased safety of blood transfusion and routine use of antibiotics and thromboprophylaxis ***(Jolly et al., 1999).***

Cesarean section is also associated with long-term risks such as postoperative pelvic adhesions, uterine scar rupture, and placental complications such as placenta previa and accreta ***(Miller et al., 1997).*** The latter two complications are likely to be associated with the poor uterine scar healing following Cesarean section.

Uterine scar dehiscence may present as an acute event in the antenatal or intrapartum period, leading to significant fetal and maternal morbidity ***(Castenada et al., 2000).***

Cesarean scar defects have long been recognized in hysteroslapingograms as anterior out-pouchings ***(Thurmond, 1996).*** The increasing use of transvaginal ultrasound and sonohysteography has allowed more frequent identification of these defects.

Cesarean sections are usually performed by incision of the lower uterine segment. Songoraphic studies have revealed various changes in the anterior uterine wall following the operation ***(Michaels et al., 1998 and Jarvela et al., 2002).*** It has been suggested that uterine rupture is more common in cases with a songraphically thin uterine wall ***(Suzuki et al., 2000).***

Transvaginal ultrasound examination is a highly accurate method for detecting Cesarean scar defects ***(Armstrong et al., 2003)***, for example in association with abnormal bleeding ***(Thurmond et al., 1999)*** or thinning of the residual myometrium ***(Regnard et al., 2004),*** which may increase the risk of uterine rupture.

AIM OF THE WORK

This study aims to find whether the transvaginal ultrasound is able to detect Cesarean section scars and their defects in the non pregnant state.

CESAREAN DELIVERY

Definition:

Cesarean delivery is defined as the birth of a fetus through incisions in the abdominal wall (laparotomy) and the uterine wall (hysterotomy). This definition does not include removal of the fetus from the abdominal cavity in case of rupture of the uterus or in case of an abdominal pregnancy ***(Cunningham et al., 2007).***

HISTORY

The concept of delivery of a living child through an abdominal incision has its origin in prehistoric times. References to these miraculous births are found in the folklore and mythology of both Eastern and Western cultures. Most of the early accounts of this mode of childbirth involved the birth of heroes or gods, demonstrating their superhuman qualities. However, the mother was usually dying or dead at the time of birth ***(Thompson, 1955).***

Francis Russet introduced the concept of performing an operation upon a living woman in the sixteenth century. He suggested several obstetric complications that were more horrific than the operation itself ***(Fasbender et al., 1906).***

The fetus had escaped into the abdominal cavity during labor and later caused an abdominal abscess that was debilitating to the woman. Next, he sought to establish the feasibility of the operation by giving an account of seven females who survived. He reported that another successful pregnancy may follow the operation ***(Young, 1944).***

In the nineteenth century, introductions of diethyl ether as an operative anesthetic by Morton and of carbolic acid anti-sepsis by Lister made the possibility of an abdominal operation as an option for childbirth more feasible ***(Troll et al., 1982)***.

Early success in the surgery was compromised by the widespread belief that once uterine muscle was incised it could not be safely sutured, principally out of fear of infection. Against this background, cesarean deliveries performed in Paris between 1787 and 1876 demonstrated 100 percent maternal mortality, mostly due to infection or hemorrhage ***(Sewell, 1993).***

The first major surgical advance in the technique of cesarean section was introduced by Porro in 1876 ***(Miller, 1992).***

Influenced by the prevailing concept of not suturing the uterine incisions, Porro introduced a technique in which the uterine funds was amputated following the delivery of the fetus and the cervical stump marsupialized to the anterior abdominal wall. Although drastic by today's standards, the Porro technique resulted in a dramatic decline in maternal mortality ***(Speert, 1958).***

The era of the modern cesarean began in 1882, when Max Saenger introduced the technique of suturing the uterus. He advocated performing a vertical incision in the uterus that avoided the lower uterine segment. After delivery of the infant and manual extraction of the placenta, Saenger closed the uterus with two layers. He recommended silver wire for the deep suture and fine silk for the superficial serosa ***(Saenger, 1882).***