



# Transvaginal Versus Transabdominal Sonography in Detection of Early Pregnancy Complications

A Thesis submitted for partial fulfillment of Master Degree of Obstetrics & Gynaecology

Ву

Amal Salah El Din Mohamed M.B., B.Ch. (1990)

Member of the Special Care Centre of the Fetus Faculty of Medicine Ain Shams University

Supervised By

### Professor Dr. Ibrahim Yassin Abou Senna

Professor of Obstetrics & Gynaecology Faculty of Medicine, Ain Shams University

### Dr. Magdy Mohamed Kamal

Assistant Professor of Obstetrics & Gynaecology Faculty of Medicine, Ain Shams University

### Dr. Hassan Tawfic Khairy

Lecturer of Obstetrics & Gynaecology Faculty of Medicine, Ain Shams University

Ain Shams University Faculty of Medicine 1996 12/1/5



بسير عبراً للقوال من الرحيد

#### **ACKNOWLEDGEMENT**

I would like to express my deepest gratitude, thanks and appreciation to Prof. Dr. **Ibrahim Yassin Abou Senna**, Professor of Obstetrics and Gynecology, Ain Shams University, for his fatherly advice and sincere support all through supervision of this work.

Also many thanks, respect and appreciation to Assist. Prof. Dr. Magdy Mohamed Kamal, Assistant Professor of Obstetrics and Gynecology, Ain Shams University, for his advice and support during supervision of this work.

I would also like to express my deepest gratitude and appreciation to lecturer Dr. Hassan Tawfic Khairy, Lecturer of Obstetrics and Gynecology, Ain Shams University, for his guidance, precious observation and effort to release this work in its present form.

Lastly but not the least, I would like to express my thanks, respect and appreciation to whole staff, members and colleagues in department of Special Care Center for the Fetus and Ultrasound Unit, Ain Shams University for their help, support and it is due to their fruitful directions that this work has been brought to light.

## **Abbreviations**

U.S.	Ultrasonography
TAS	Trans abdominal sonography
TVS	Trans vaginal sonography
<	Less than
>	More than
G.A.	Gestational age

## **Abstract**

- Obstetric ultrasonography at time of first trimester is a helpful diagnostic tool in evaluating pregnancy status.
- The application of high resolution vaginal ultrasound, problems such as obesity, bowel gas, retroverted uterus and inability to permit full bladder no longer perculde accurate diagnosis.
- The study was carried out at Special Care Center for The Fetus Ain Shams Maternity Hospital over hundred pregnant patients in their first trimester complaining of vaginal bleeding and lower abdominal pain.
- It was found that transvaginal sonography is superior to transabdominal sonography in evaluating complicated pregnancy status before 7 weeks gestation, however, about 7 weeks both techniques were equally reliable in diagnosing normal and complicated pregnancy.

So in clinical practice, initial transabdominal scan could be performed then in doubtful cases, a careful vaginal scan could be made complicating abdominal sonography.

# **List of Figures**

		•	Page
Figure	(1):	Ossilation of sound wave against time	. 1
Figure	(2):	Reflection of sound beam and transmission	
		across the interface	. 6
Figure	(3):	Reflection of sound beam and the	
		incident angle	. 7
Figure	(4):	The ultrasound beam and the geometry	
		of the crystal	10
Figure	(5):	Mechanical sector scanner	. 12
Figure	(6):	Mechanical convex on curved scanner	. 14
Figure	(7):	Electronic sector scanning	. 15
Figure	(8):	The anatomical relation of the endovaginal	
		probe and pelvic organs	. 22
Figure	(9):	Diagramatic summary of ovarian cycle,	
		fertilization & human development to the	
		blastocyst stage	24
Figure	(10):	Illustration of blastocyst implantation	
		into the endometrium	24
Figure	(11):	Illustration of secondary yolk sac	
		formation	25
Figure	(12):	Maternal serum HCG levels and gestational	
		age correlation	. 30
Figure	(13):	Sequential appearance of embryonic structure.	. 33
Figure	(14):	Presence and absence of embryonic structure	
		according to weeks of gestation	. 38
Figure	(15):	Cardiac rate compared with menstrual age	
		for both viable and aborted embryos	. 59
Figure	(16):	Association of first trimester	
		oligohydarmnios with spontaneous abortion	. 60
Figure	(17):	Demonstration of intrauterine hemorrhage	
		related to gestational sac	. 63

			Page
Figure	(18):	Demonstration of blighted ovum by	
		transabdominal and transvaginal scan	64
Figure	(19):	Demonstration of blighted ovum by	
-		transabdominal and transvaginal scan	65
Figure	(20):	Demonstration of abnormal trophoblastic	
		reaction by transabdominal and	
		transvaginal scan	69
Figure	(21):	Demonstration of embryonic demise by	
		transabdominal and transvaginal scan	70
Figure	(22):	Demonstration of complete abortion by	
		transvaginal scan	71
Figure	(23):	Demonstration of incomplete abortion by	
		transvaginal scan	. 71
Figure	(24):	Demonstration of abortion in progress	
		by transabdominal scan	. 72
Figure	(25):	Demonstration of flat regular sac with	
		poorly developed decidual reaction	. 75
Figure	(26):	HCG correlation with pseudo gestational	
		sacs in women with ectopic pregnancy	. 78
Figure	(27):	Illustration of the difference in location	
		and appearance of true gestational sac	
		compared with pseudogestational sac	. 79
Figure	(28):	Illustration of different intrauterine	
		findings associated with ectopic pregnancy	. 79
Figure	(29):	Demonstration of pseudo gestational sac	
		by transvaginal scan	. 80
Figure	(30):	Demonstration of pseudogestational sac	
		simulating embryonic demise by	
		transvaginal scan	. 80
Figure	(31):	Demonstration of an intrauterine pregnancy	
		by vaginal & abdominal sonography & the	
		emphasizing evidence against an	
		ectopic pregnancy	. 81

			Page
Figure	(32):	Illustration of adnexal findings seen in	
		women with ectopic pregnancy	83
Figure	(33):	Demonstration of extrauterine gestational	
		sac by transabdominal and transvaginal scan	84
Figure	(34):	Demonstration of ectopic pregnancy by	
		transabdominal and transvaginal scan	85
Figure	(35):	Demonstration of ectopic pregnancy with	
		hematosalpinx by transabdominal and	
		transvaginal scan	86
Figure	(36):	Transabdominal and transvaginal sonography	
		in ectopic pregnancy with hematosalpinx	867
Figure	(37):	Demonstration of false +ve tubal ring	87
Figure	(38):	Drawing of cul-de-sac findings with	
		ectopic pregnancy	88
Figure	(39):	Illustration of pseudogestational sac with	
		echogenic fluid	89
Figure	(40):	Major studied groups of patients with	
		early pregnancy bleeding	117
Figure	(41):	Sonographic findings using transabdominal	
		and transvaginal approaches in threated	
		abortion	118
Figure	(42):	Confirmed cases of absent embryonic heart	
		pulsations using transabdominal versus	
		transvaginal approach in patients with	
		missed abortion	119
Figure	(43):	Sonographic findings in patients with	
		blighted ovum using transabdominal and	
		transvaginal apporoach	120
Figure	(44):	Sonographic findings in patients with	
		ectopic pregnancy using transabdominal	
		versus transvaginal approach	121
Figure	(45):	Sonogrphic findings in patients with	
		complete, incomplete abortion, & molar	
		pregnancy using transabdominal versus	
		transvaginal approach	122

# List of Tables

		1	Page
Table	(1):	Transvaginal versus transabdominal	
		sonographic findings of yolk sac in	
		patients with threatened abortion	109
Table	(2):	Transvaginal versus transabdominal	
		sonographic findings of embryonic pole	
		detection in patients with threatened	
		abortion	. 110
Table	(3):	Transvaginal versus transabdominal	
		sonographic detectionof heart pulsation	
		in patients with threatened abortion	. 111
Table	(4):	Transvaginal versus transabdominal	
		sonography in detection of subchorionic	
		hematoma	. 112
Table	(5):	Transvaginal versus transabdoinal	
		sonography in confirming about embryonic	
		heart pulsation in patients with missed	
		abortion	. 113
Table	(6):	Transvaginal versus transabdominal	
		sonographic findings in patients with	
		blighted ovum	. 114
Table	(7):	Transvaginal versus transabdominal	
		sonography findings in ectopic pregnancy.	. 119

# **List of Plates**

			Page
Plate	(1):	Abdominal scan showing gestational sac,	
		yolk sac	123
Plate	(2):	Vaginal scan showing gestational sac,	
		yolk sac and embryo	123
Plate	(3):	Abdominal scan showing gestational sac	
		and subchorionic hematoma	124
Plate	(4):	Vaginal scan showing gestational sac	
		and subchorionic hematoma	124
Plate	(5):	Abdominal scan showing gestational sac	
		and subchorionic hematoma	125
Plate	(6):	Vaginal scan showing gestational sac	
		and subchorionic hematoma	125
Plate	(7):	Abdominal scan showing gestational sac	
		with missed abortion	126
Plate	(8):	Vaginal scan showing gestational sac	
		with missed abortion	126
Plate	(9):	Abdominal scan showing blighted ovum	127
Plate	(10):	Vaginal scan showing blighted ovum	127
Plate	(11):	Abdominal scan showing incomplete abortion	128
Plate	(12):	Vaginal scan showing incomplete abortion	128
Plate	(13):	Abdominal scan showing molar pregnancy	129
Plate	(14):	Vaginal scan showing molar pregnancy	129
Plate	(15):	Abdominal scan showing right adnexal	
		ectopic pregnancy	130
Plate	(16):	Vaginal scan showing right adnexal	
		ectopic pregnancy	130
Plate	(17):	Vaginal scan showing tubal pregnancy	131
Plate	(18):	Vaginal scan showing extrauterine	
		qestational sac	131

## **Contents**

		Page
*	Introduction	1
*	Review of the Study	3
	- Basic physics of ultrasound	4
	- Sonoembryology	23
	- Early pregnancy complications	3.9
	- Sonographic findings of early pregnancy	
	complications and threatened abortion	56
	- Transabdominal sonography versus transvaginal	
	sonography	93
*	Patients and Methods	104
*	Results	108
*	Discussion	132
*	Summary and Conclusion	142
*	References	. 14!
_	Arabia Cummaru	