



Cairo University

***Diagnostic accuracy of three dimensional
sonohysterography versus hysteroscopy in the
evaluation of the uterine cavity in cases of
premenopausal bleeding with suspected intracavitary
lesions with correlation to histopathological findings***

Thesis

***Submitted for fulfillment of master degree (M.sc) in Obstetrics &
Gynecology***

By:

Amal Mohsen Ahmed Al-qaisi

(M.B., B.Ch., Cairo University)
Resident of obstetrics and gynecology
Faculty of medicine – Cairo University

Supervised by:

Prof. Ashraf Abdelrahman Ramadan

Professor of obstetrics & gynecology
Faculty of medicine - Cairo University

Dr. Waleed Mamdouh El-khayat

Assistant Professor Of Obstetrics and gynecology
Faculty of Medicine - Cairo University

Dr. Mohammed Faisal Ebrahim

Assistant Professor of Pathology
Faculty of Medicine - Cairo University

**Faculty of medicine
Cairo University
2015**

ABSTRACT

Aim of the work: to compare the diagnostic accuracy of three dimensional sonohysterography versus hysteroscopy in the evaluation of the uterine cavity in cases of premenopausal bleeding with suspected intracavitary lesions with correlation to the histopathological findings, and to see if (3D-SHG) is superior or comparable to hysteroscopy in the diagnosis of these lesions.

Methods: 50 women with premenopausal bleeding with suspected intracavitary lesions either by 2D transvaginal ultrasound or by hysterosalpingography were subjected to three dimensional saline infusion sonohysterography, office hysteroscopy and subsequent surgical procedures (fractional curettage, hysterectomy, polypectomy or myomectomy) followed by histopathological examination of the specimens

Results & Conclusions: three dimensional saline infusion sonohysterography is comparable to diagnostic hysteroscopy in diagnosis of intracavitary lesions, the sensitivity, specificity, PPV, NPV and overall accuracy were; 97.83%, 100%, 100%, 80% & 98% respectively for (3D-SIS), and 100%, 100%, 100%, 100% & 100% respectively for (OH).

Keywords: premenopausal bleeding - intracavitary lesions - three dimensional saline infusion sonohysterography - hysteroscopy - histopathology.

ACKNOWLEDGMENT

Firstly and lastly thanks to Allah the most merciful for his help.

I would like to express my deepest gratitude and sincere appreciation to ***Prof. Dr. Ashraf Abdelrahman Ramadan***, Professor of Obstetrics & Gynecology, Faculty of Medicine, Cairo University. I'm greatly thankful to him for his fatherly attitude, enthusiastic encouragement, his sincere advice, and supervision. He was very generous with his time and effort.

My extreme thanks and gratefulness to ***Assist Prof. Dr. Waleed Mamdouh El-khayat***, Assistant Professor of Obstetrics & Gynecology, Faculty of Medicine, Cairo University. He was very generous with his time and advice, which helped to simplify my hard task of preparing this work, for his sincere supervision and the endless effort.

Also I would like to thank ***Assist. Prof. Dr. Mohammed Faisal Ebrahim***, Assistant professor of Pathology, Faculty of Medicine, Cairo University, for his keen interest, beneficial advice and constant support.

Many grateful thanks to my parents for their continuing love, care and strong support, to whom I'm indebted for what I am today. My grateful thanks to my old sister for her support throughout my life. My great love to my daughter, who is the source of power and hope in my life.

I'm grateful to all my professors, all my colleagues for their help and cooperation throughout this work. And finally, I'm grateful to the patients for whom all our efforts are devoted.

Amal Mohsen Ahmed Al- qaisi

CONTENTS

List of abbreviations	I
List of figures	III
List of tables	V
Introduction	1
Aim of the work	3
Review of literature	
<i>Chapter 1: Premenopausal bleeding</i>	4
<i>Chapter 2: Three dimensional saline infusion sonohysterography</i>	13
<i>Chapter 3: Hysteroscopy</i>	31
<i>Chapter 4: Pathology of some uterine cavity lesions</i>	55
Patients and methods	71
Results	75
Discussion	92
Conclusion and recommendation	99
Summary	100
References	105
Arabic summary	

LIST OF ABBREVIATIONS

Abbreviation	Detail
2D	Tow dimensional
2D-SHG	Two dimensional sonohysterography
2D-SIS	Tow dimensional saline infusion sonohysterography
2D-TVS	Tow dimensional transvaginal ultrasound
3D	Three dimensional
3D-SHG	Three dimensional sonohysterography
3D-SIS	Three dimensional saline infusion sonohysterography
AUB	Abnormal uterine bleeding
BMI	Body mass index
CI	Confident interval
CM	Centimeters
CO2	Carbon dioxide
DH	Diagnostic hysteroscopy
DUB	Dysfunctional uterine bleeding
E	Eosin
E.g.	For example
EMP	Endometrial polyp
ET	Endometrial thickness
FN	False negative
FP	False positive
FSH	Follicular stimulating hormone
H	Haematoxylin
HP	Histopathology
HSP	Hysterosalpingography
IU	International unite
IUD	Intrauterine device

IUI	Intrauterine insemination
Mg	Milli-gram
Min	Minute
MIU	Milli-international unite
MI	Milliliter
Mm	Millimeter
MMHG	Millimeter mercury
MMMT	Malignant mixed mesodermal tumor
MMPs	Matrix metalloproteinases
NPV	Negative predictive value
NSAID	Non steroidal anti-inflammatory drugs
OH	Office hysteroscopy
P	Probability
PCOS	Poly cystic ovary syndrome
PPV	Positive predictive value
SD	Standard deviation
SHG	Sonohysterography
SIS	Saline infusion sonohysterography
SPSS	Statistical package for the social science
TN	True negative
TP	True positive
TURP	Trans-urethral resection of prostate

LIST OF FIGURES

Number	Title
1	Sonohysterogram during secretory phase
2	Sonohysterogram showing importance of balloon placement
3	Sonohysterogram adequately visualized normal cervical canal
4	Diagram showing calculation of extension index
5	Normal Saline infusion sonohysterography: sagittal view and 3D rendering
6	3D saline infusion sonohysterography showing an endometrial polyp
7	3D saline infusion sonohysterography showing submucous myoma
8	Sonohysterogram of endometrial hyperplasia
9	3D saline infusion sonohysterography in case of asherman's Syndrome
10	3D-SIS of bicornuate uterus
11	3D-SIS of septate uterus
12	Bozzini's endoscope
13	Diagram of Desormeaux's endoscope.
14	Internal cervical os and uterine cavity by hysteroscopy
15	Both tubal orifices by hysteroscopy
16	Submucous myoma by hysteroscopy
17	Single typical polyp by hysteroscopy
18	Multiple typical polypi
19	Simple endometrial hyperplasia by hysteroscopy
20	Polypoidal carcinoma of endometrium by hysteroscopy
21	Multiple central adhesions by hysteroscopy
22	A uterine septum by hysteroscopy
23	Gross picture of different types of fibroids
24	Microscopic feature of leiomyoma
25	Gross picture of leiomyosarcoma
26	Gross picture of an endometrial polyp
27	Microscopic appearance of polyp
28	Microscopy of Adenomyomatous polyp
29	Microscopic appearance of simple hyperplasia
30	Microscopic appearance of complex hyperplasia
31	Gross appearance of endometrial carcinoma
32	Microscopic appearance of endometrial carcinoma
33	Endometrial stromal sarcoma
34	Statics: Premenopausal bleeding pattern
35	Statics: Intrauterine lesions detected by 3D-SHG
36	Statics: Intrauterine lesions detected by office hysteroscopy

37	Statics: Definitive diagnosis of the intrauterine lesions (histopathological study)
38	Statics: Correlation of the findings from (3D-SHG) to that of (HP) in cases of endometrial polyp
39	Statics: Correlation of the findings from (OH) to that of (HP) in cases of endometrial polyp
40	Statics: Comparison of true (+ve) findings of both (3D-SHG) & (OH) to that of (HP)
41	Statics: Sensitivity of both (3D-SHG) & (OH)
42	Statics: Specificity of both (3D-SHG) & (OH)
43	Statics: Positive predictive values of both (3D-SHG) & (OH)
44	Statics: negative predictive values of both (3D-SHG) & (OH)
45	Statics: Overall accuracy of both (3D-SHG) & (OH)
46	3D-SHG showing submucous myoma projecting > 50% in the uterine cavity
47	3D-SHG showing an endometrial polyp
48	3D-SHG showing thick Polypoidal endometrium
49	Office hysteroscopy showing submucous myoma
50	Office hysteroscopy showing an endometrial polyp
51	H&E picture showing leiomyoma (×200)
52	H&E picture showing an endometrial polyp (×200)
53	H&E picture showing disordered proliferative endometrium (×200)
54	H&E picture showing simple endometrial hyperplasia (×200)

LIST OF TABLES

Number	Title
1	Statics: Clinical data for the participants
2	Statics: Premenopausal bleeding pattern
3	Statics: Intrauterine lesions detected by 3D-SHG
4	Statics: Intrauterine lesions detected by office hysteroscopy
5	Statics: Definitive diagnosis of the intrauterine lesions (histopathological study)
6	Statics: Correlation of the findings from (3D-SHG) to that of (HP) in cases of endometrial polyp
7	Statics: Correlation of the findings from (OH) to that of (HP) in cases of endometrial polyp
8	Statics: Findings of both (3D-SHG) & (OH) to that of (HP) in cases of myomas, hyperplasia and carcinoma
9	Statics: Comparison between the true (+ ve) findings of both (3D- SHG) & (OH) to that of definitive diagnosis (HP)
10	Statics: Comparison of sensitivity, specificity, positive and negative predictive values and overall accuracy of both (3D-SHG) & (OH) in the diagnosis of the intrauterine lesions

INTRODUCTION

INTRODUCTION

Abnormal uterine bleeding (AUB) is the most common cause of many gynecological visits in premenopausal period and can occur due to the presence of intracavitary lesions, which is either benign conditions e.g., leiomyoma, endometrial polyps and endometrial hyperplasia, or the presence of endometrial cancer (**Ascher & Reinhold., 2002**), so it is very important to assess the uterine cavity in women who sought medical advice for premenopausal bleeding with suspected intracavitary lesions either by 2D transvaginal ultrasound (2D-TVS) or by hysterosalpingography (HSG) (**Valle., 2005**).

The gold-standard tool for the evaluation of the interior of the uterus is hysteroscopy (**Revel et al., 2002**), but it is an invasive procedure, relatively expensive, it does not provide information about the adnexa or myometrium, it only provides subjective assessment for the size of a lesion and the depth of myometrial extension of myomas (**Makris et al., 2006**), and it is associated with many risks such as uterine perforation and ascending genitourinary infection (**Dueholm et al., 2001**) and it is not always available in low resource settings and many gynecologists lack expertise in interpreting the findings (**Gunes et al., 2008**).

Saline-infusion sonohysterography (SIS) is an attractive and minimally invasive, cheap, relatively safe procedure that can be used in the evaluation and detection of pelvic pathology. But it does not give a

satisfactory evaluation of small localized lesions and it does not allow easy differentiation between endometrial and myometrial abnormalities (**Widrich et al., 1996**). The addition of three-dimensional transvaginal ultrasound provides better visualization and improves the accuracy in the evaluation of adnexa, pelvic pathologies, uterine contour and focal lesions (**Glanc et al., 2008**) and their myometrial depth (**Makris et al., 2006**), as it allows Simultaneous display of the three perpendicular planes that give access to plane that can't be obtained by the two-dimensional sonohysterography (2D-SHG). Also, in three dimensional sonohysterography (3D-SHG), after distending the uterine cavity with saline there is clear visualization of the inner surface of both sides of the endometrium (**Salim et al., 2005**).

Being able to distinguish between the different conditions allows the physician to determine the appropriate treatment method.

In this study, the premenopausal women with abnormal uterine bleeding with suspected intracavitary lesions either by (2D-TVS) or by (HSG) were subjected to both (3D-SIS) & office hysteroscopy (OH), subsequent surgical procedures such as fractional curettage, polypectomy, myomectomy and hysterectomy were done, histopathological study of specimens was done and the results were compared to those of both (3D-SIS) & (OH) to detect their diagnostic accuracy in diagnosis of intracavitary lesions, and to see if (3D-SIS) is comparable or superior to (OH) in diagnosis of such lesions.

AIM OF WORK

AIM OF THE WORK

Evaluate the role of three dimensional sonohysterography (3D-SHG) versus hysteroscopy in detection of the uterine cavity lesions in premenopausal bleeding.

REVIEW OF LITERATURE