

# **Role of diagnostic hysteroscopy and histopathology in evaluation of abnormal uterine bleeding**

*Thesis*

Submitted for Partial Fulfillment of Master Degree  
in Obstetrics and Gynecology

*By*

**Shaymaa Ismael Hussein Al-Ani**

M.B.CH.B. - Faculty of Medicine  
Al-Anbar University

*Under supervision of*

**Prof. Hatem Hussein El-Gamal**

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

**Prof. Magda Mohammad Abd-El-Salam**

Professor of Histopathology  
Faculty of Medicine – Ain Shams University

**Dr. Reda Mokhtar Kamal Ghanem**

Lecturer in Obstetrics and Gynecology  
Faculty of Medicine – Ain Shams University

**Faculty of Medicine  
Ain Shams University**



**2018**

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالَ

سَبِّحْناكَ لَا عِلْمَ لَنَا  
إِلَّا مَا عَلِمْتَنا إِنَّكَ أَنْتَ  
الْعَلِيمُ الْعَظِيمُ

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. Hatem Hussein El-Gamal**, 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 would like to express my great appreciation and thanks to **Prof. Magda Mohammad Abd-El-Salam**, Professor of Histopathology Faculty of Medicine – Ain Shams University, for her meticulous supervision, and her patience in reviewing and correcting this work,*

*I would like also to thank **Dr. Reda Mokhtar Kamal Ghanem**, Lecturer in Obstetrics and Gynecology Faculty of Medicine – Ain Shams University, for the efforts and time he has devoted to accomplish this work,*

*Special thanks to my **parents** and my **Husband** for their mercy, love and great support, and lastly my gratitude is dedicated to the ones who are not with us, but they prayed for me, and I am sure they will always do.*



*Shaymaa Ismael Hussein Al-Ani*

## **List of Contents**

<i><b>Subject</b></i>	<i><b>Page No.</b></i>
<b>List of Abbreviations.....</b>	<b>i</b>
<b>List of Tables.....</b>	<b>ii</b>
<b>List of Figures .....</b>	<b>vii</b>
<b>Introduction .....</b>	<b>1</b>
<b>Aim of the Work.....</b>	<b>5</b>
<b>Review of Literature</b>	
Anatomy of the Uterus .....	6
Physiology of Menstrual Cycle.....	10
Abnormal Uterine Bleeding .....	14
Hysteroscopy .....	23
Pathology of Some Uterine Cavity Lesions.....	48
<b>Patient and Methods .....</b>	<b>65</b>
<b>Results.....</b>	<b>76</b>
<b>Discussion .....</b>	<b>92</b>
<b>Conclusion.....</b>	<b>98</b>
<b>Recommendations .....</b>	<b>99</b>
<b>Summary .....</b>	<b>100</b>
<b>References .....</b>	<b>104</b>
<b>Arabic Summary .....</b>	<b>—</b>

---

## List of Abbreviations

<i>Abbr.</i>	<i>Full-term</i>
<b>ACOG</b>	: American college for Obstetricians and Gynecologists
<b>AUB</b>	: Abnormal uterine bleeding
<b>BMI</b>	: Body mass index
<b>CC</b>	: Correct classification rate
<b>CM</b>	: Centimeters
<b>CO<sub>2</sub></b>	: Carbon dioxide
<b>CRF</b>	: Case report form
<b>DH</b>	: Diagnostic hysteroscopy
<b>DUB</b>	: Dysfunctional uterine bleeding
<b>E</b>	: Eosin
<b>ECP</b>	: Endocervical polyp
<b>E.g.</b>	: Example
<b>EH</b>	: Endometrial hyperplasia
<b>EMC</b>	: Endometrial carcinoma.
<b>EMH</b>	: Endometrial hyperplasia
<b>EMP</b>	: Endometrial polyp
<b>ESGE</b>	: European Society of Gastrointestinal Endoscopy
<b>FIGO</b>	: International Federation of Gynecology and Obstetrics
<b>FN</b>	: False negative
<b>FNR</b>	: False negative rate
<b>FNR</b>	: False Negative Rate
<b>FP</b>	: False positive
<b>FPR</b>	: False positive rate
<b>FPR</b>	: False Positive Rate
<b>H</b>	: Haematoxylin
<b>HP</b>	: Histopathology
<b>HRT</b>	: Humen replacement therapy
<b>HSP</b>	: Hysterosalpingography
<b>IU</b>	: International unite
<b>IUD</b>	: Intrauterine device
<b>LH</b>	: Luteinizing hormone

<b>LR</b>	: Likelihood Ratio
<b>MC</b>	: Misclassification rate
<b>Mg</b>	: Milli-gram
<b>MIU</b>	: Milli-international unite
<b>MI</b>	: Milliliter
<b>Mm</b>	: Millimeter
<b>MMHG</b>	: Millimeter mercury
<b>MMMT</b>	: Malignant mixed mesodermal tumor
<b>MMPs</b>	: Matrix metalloproteinases
<b>NPV</b>	: Negative predictive value
<b>NPV</b>	: Negative Predictive Value
<b>NSAIDs</b>	: Non-steroidal anti-inflammatory agents
<b>OH</b>	: Office Hysteroscopy
<b>PCOS</b>	: Poly cystic ovary syndrome
<b>PPV</b>	: Positive Predictive Value
<b>SD</b>	: Standard deviation
<b>Se</b>	: Sensitivity
<b>SMM</b>	: Submucous myoma
<b>SMM</b>	: Submucous myoma
<b>SPSS</b>	: Statistical Package for the Social Science
<b>Sp</b>	: Specificity
<b>TP</b>	: True positive
<b>TURP</b>	: Trans-urethral resection of prostate
<b>TN</b>	: True negative
<b>SD</b>	: Standard deviation

## **List of Tables**

<b>Table No.</b>	<b>Title</b>	<b>Page No.</b>
<b>Table (1):</b>	Common Causes of Abnormal Vaginal Bleeding.....	3
<b>Table (2):</b>	Demographic data for the whole study population .....	76
<b>Table (3):</b>	Menopausal state, regularity of menstruation and prevalence of associated diseases in the study population.....	77
<b>Table (4):</b>	Presenting symptom.....	78
<b>Table (5):</b>	Summary of hysteroscopic and histopathological findings .....	80
<b>Table (6):</b>	Hysteroscopic findings cross-tabulated versus histopathological findings.....	81
<b>Table (7):</b>	Overall correct classification and misclassification rates of hysteroscopy .....	83
<b>Table (8):</b>	Accuracy of hysteroscopy for diagnosis of intrauterine lesion in patients with abnormal uterine bleeding.....	85
<b>Table (9):</b>	Accuracy of hysteroscopy for diagnosis of endocervical polyp.....	86
<b>Table (10):</b>	Accuracy of hysteroscopy for diagnosis of endometrial polyp .....	87
<b>Table (11):</b>	Accuracy of hysteroscopy for diagnosis of submucous myoma .....	88
<b>Table (12):</b>	Accuracy of hysteroscopy for diagnosis of endometrial hyperplasia.....	89
<b>Table (13):</b>	Accuracy of hysteroscopy for diagnosis of endometrial adenocarcinoma .....	90

## List of Figures

<i>Figure No.</i>	<i>Title</i>	<i>Page No.</i>
<b>Figure (1):</b>	Normal shape of the uterus .....	6
<b>Figure (2):</b>	Reconstruction of uterus, showing shape of its cavity and cervical canal.....	7
<b>Figure (3):</b>	Three outlines of the uterus, showing a more normal position (anteversion) and a moderate and a more extreme degree of retroversion.....	8
<b>Figure (4):</b>	The human female reproductive cycle .....	10
<b>Figure (5):</b>	Bozzini's endoscope displayed at the American College of Surgeons headquarters in Chicago .....	23
<b>Figure (6):</b>	Diagram of Desormeaux's endoscope. ....	24
<b>Figure (7):</b>	Right image is the internal cervical os & the left one is uterine cavity .....	30
<b>Figure (8):</b>	Right tubal ostium .....	30
<b>Figure (9):</b>	Large intramural myoma pushing into the uterine cavity from the posterior wall. ....	43
<b>Figure (10):</b>	Single typical polyp B. Multiple typical polypi .....	44
<b>Figure (11):</b>	Endometrial hyperplasia .....	45
<b>Figure (12):</b>	Carcinoma Endometrium.....	46
<b>Figure (13):</b>	Multiple central adhesions .....	46
<b>Figure (14):</b>	A septum dividing the uterus in two cavities ....	47
<b>Figure (15):</b>	Gross picture of different types of fibroids .....	49



<b>Figure (16):</b> Microscopic feature of leiomyoma.....	50
<b>Figure (17):</b> Gross Appearance of leiomyosarcoma.....	51
<b>Figure (18):</b> Gross Picture of endometrial polyp .....	52
<b>Figure (19):</b> Microscopic appearance of polyps.....	53
<b>Figure (20):</b> Microscopy of Adenomyomatous polyp.....	54
<b>Figure (21):</b> Microscopic appearance of simple hyperplasia .....	57
<b>Figure (22):</b> Microscopic appearance of complex hyperplasia .....	58
<b>Figure (23):</b> Gross appearance of endometrial carcinoma..	61
<b>Figure (24):</b> Microscopic appearance of endometrial cancer .....	62
<b>Figure (25):</b> Endometrial stromal sarcoma.....	64
<b>Figure (26):</b> Presenting symptom. ....	79
<b>Figure (27):</b> Hysteroscopic findings plotted versus histopathological findings. ....	82
<b>Figure (28):</b> Overall correct classification and misclassification rates of hysteroscopy .....	83
<b>Figure (29):</b> Accuracy of hysteroscopy for diagnosis of various lesions. ....	91

## Abstract

**Background:** Abnormal uterine bleeding is a bleeding from uterine compose that is abnormal in volume, regularity and/or timing that has been present for the majority of the last 6 months. Evaluation of women with abnormal uterine bleeding should be through history taking, systemic and local examination, laboratory investigations, imaging and different diagnostic procedures including hysteroscopy. **Aim of the Work:** to assess the accuracy of hysteroscopy in the diagnosis of the cause of bleeding in women with Abnormal Uterine Bleeding. **Patients and Methods:** This prospective observational study was conducted on 114 patients attended the Early Cancer Detection Unit, Faculty of Medicine, Ain Shams University between July 2017 and April 2018, to assess the role of diagnostic hysteroscopy and histopathology in evaluation of abnormal uterine bleeding. **Results:** hysteroscopy had a sensitivity of 91.9%, specificity of 86.5%, positive predictive value of 93.2%, and negative predictive value of 84.2% and diagnostic accuracy of 90.1% for diagnosing etiology of abnormal uterine bleeding. **Conclusion:** Hysteroscopy has a definitive role in evaluating patients with abnormal uterine bleeding especially with patient with thick endometrium and in any age group. Hysteroscopy is a safe and reliable procedure in the diagnosis of cases with abnormal uterine bleeding with high sensitivity, specificity, positive predictive value and negative predictive value and the results of hysteroscopy are immediately available. Hysteroscopy and histopathology complement each other in evaluating patients with abnormal uterine bleeding for accurate diagnosis and further treatment.

**Key words:** hysteroscopy, histopathology, uterine bleeding

## Introduction

*A*bnormal uterine bleeding is a bleeding from uterine compose that is abnormal in volume, regularity and/or timing that has been present for the majority of the last 6 months. It may be excessively heavy or light and may be prolonged, frequent, or random (*Khrouf and Terras, 2014*).

Abnormal vaginal bleeding is a common complaint in primary care. The prevalence of some type of abnormal bleeding is up to 30% among women of reproductive age (*Singh et al., 2013*).

Over 18% of all gynecology outpatient visits in the United States are for menorrhagia alone (*Sharma and Yadav, 2013*).

Because most cases are associated with anovulatory menstrual cycles, adolescents and perimenopausal women are particularly vulnerable. About 20% of affected individuals are in the adolescent age group, and 50% of affected individuals are aged 40-50 years (*Rezk et al., 2015*).

In 2011, the International Federation of Gynecology and Obstetrics (FIGO) published a new classification system and the American College of Obstetrician-Gynecologists has also endorsed this new classification system (*ACOG practice Bulletin, 2012*).

This system divides the etiology of abnormal uterine bleeding into structural and non-structural causes and follows the acronym PALMCOEIN (**Table 1**).

New nomenclature uses the acronym of AUB (abnormal uterine bleeding) with the initial from the classification system as a description of the disorder (eg, abnormal uterine bleeding caused by ovulatory disorders is referred to as AUB-O). Differential diagnosis will vary based on symptomatology as well as age.

Pregnancy is a possible cause of any type of abnormal bleeding in any woman of reproductive age (ie, after menarche and before menopause). Many systemic illnesses and medications can affect menstrual bleeding and should be included in a broad differential diagnosis of a presenting woman (*Mukhopadhyay and Ashis, 2014*).

**Table (1):** Common Causes of Abnormal Vaginal Bleeding

<b>PALM (structural causes)</b>
<b>Polyp</b> <ul style="list-style-type: none"><li>Endometrial polyps</li><li>Cervical polyps</li></ul>
<b>Adenomyosis</b>
<b>Leiomyoma</b> <ul style="list-style-type: none"><li>Submucosal fibroids</li><li>Other leiomyomas</li></ul>
<b>Malignancy and hyperplasia</b> <ul style="list-style-type: none"><li>Endometrial hyperplasia</li><li>Hyperplasia with atypia</li><li>Endometrial carcinoma</li></ul>
<b>COEIN (non-structural causes)</b>
<b>Coagulopathy</b> <ul style="list-style-type: none"><li>Liver failure</li><li>Anticoagulant use</li><li>Inherited bleeding disorders (von Villebrand's disease most common)</li></ul>
<b>Ovulatory dysfunction</b> <ul style="list-style-type: none"><li>Physiologic (adolescence, perimenopause, lactation)</li><li>Polycystic ovary syndrome</li><li>Female athlete triad</li><li>Hypothalamic dysfunction (eg, eating disorder, stress)</li><li>Thyroid disease</li><li>Hyperprolactinemia</li><li>Pituitary disorder</li><li>Primary ovarian insufficiency</li><li>Iatrogenic (eg, from radiation or chemotherapy)</li></ul>
<b>Endometrial</b> <ul style="list-style-type: none"><li>Hormonal imbalance</li><li>Endometrial atrophy</li></ul>
<b>Iatrogenic</b> <ul style="list-style-type: none"><li>Endogenous hormones (contraception, HRT, IUD)</li><li>Anticoagulant use</li></ul>
<b>Not yet classified</b> <ul style="list-style-type: none"><li>Vaginitis</li><li>Cervicitis</li></ul>

Until recent times, usual method of evaluating this symptom was dilatation and curettage. But this detects the cause in less than 50% of the cases. Hysteroscopy offers a valuable extension of the gynecologist's armamentarium. It can improve the diagnostic accuracy and can permit better treatment of uterine diseases. After hysteroscopy, the elective surgery of the patient can be planned better (**Shruti and Page. 2007**).

Hysteroscopy allows direct visualization of the endometrial cavity and importantly, directed endometrial sampling of any suspicious areas (**Pamnani and Modi. 2014**).

Use of hysteroscopy in abnormal uterine bleeding is almost replacing blind curettage, as it "sees" and "decides" the cause. This is because the uterine cavity can be observed and the area in question can be curetted. In fact, it is an eye in the uterus (**Phalak et al., 2015**).

The aims and objectives of this study is to study the accuracy of hysteroscopy in evaluation of abnormal uterine bleeding and to correlate hysteroscopic findings with histopathologic findings.

## **Aim of the Work**

**T**his study aim to assess the accuracy of hysteroscopy in the diagnosis of the cause of bleeding in women with Abnormal Uterine Bleeding.