

Contents

Subjects	Page
List of abbreviations.....	II
List of Figures	V
List of Tables	VII
Abstract.....	X
• Introduction	1
• Aim of the work	3
• Review of Literature	
♦ Chapter (1): Pathology of different causes of postmenopausal bleeding.....	4
♦ Chapter (2): Normal transvaginal ultrasonographical anatomy of female pelvis	24
♦ Chapter (3): Transvaginal ultrasonography manifestations of pathological causes of postmenapausal bleeding.....	34
♦ Chapter (4): Normal MRI anatomy of female pelvis.....	48
♦ Chapter (5): MRI manifestations of pathological causes of postmenopausal bleeding.....	57
• Materials and Methods	76
• Results	86
• Case Presentation	94
• Discussion	112
• Summary and Conclusion	119
• References	121
• Arabic Summary	

List of Abbreviations

ADC	Apparent Diffusion Co-efficient
AGC	Atypical Glandular Cells
AIS	Adenocarcinoma In Situ
AJCC	American Joint Committee on Cancer
AUB	Abnormal Uterine Bleeding
CIN	Cervical Intraepithelial Neoplasia
CIS	Carcinoma In Situ
CS	Carcinoma
CT	Computed Tomography
DES	Diethylstilbestrol
DTPA	Diethylenetriamine pentaacetic acid
DW	Diffusion-Weighted
ED	Emergency Department
EESs	Endometrial Stromal Sarcomas
EEC	Endometrial echo complex
EIN	Endometrial Intraepithelial Neoplasia
ET	Endometrial Thickness (ET)
Fat-sat	Fat Suppression

FIGO	Federation of Obstetrics and Gynecology (FIGO)
FSE	Fast Spin Echo
HCG	Human Chorionic Gonadotrophin
HNPCC	Hereditary Nonpolyposis Colorectal Cancer
HPV	Human Papilloma Virus
HRT	Hormone Replacement Therapy
JZ	Junctional Zone
LN	Lymph Node
MMMTs	Malignant mixed mullerian tumors
MRI	Magnetic Resonance Imaging
PaP	Papanicolaou (pap) Smears
PCOS	Polycystic Ovary Syndrome
PID	Pelvic Inflammatory Disease
PMB	Postmenopausal Bleeding
PTEN	Phosphatase-Tensin Enzyme
SCC	Squamous Cell Carcinoma
SCJ	Squamocolumnar Junction
SERM	Selective Estrogen Receptor Modulator
SIL	Sequamous Intraepithelial Lesion

TNM	Tumour, Nodes, Metastasis
TVUS	Transvaginal Ultrasonography
TVU	Transvaginal Ultrasound (TVU))

List of Figures

<u>No.</u>	<u>Figure</u>	<u>Page</u>
<u>1</u>	Histopathological Vaginal mucosa in the basal condition with a thinner epithelium	7
<u>2</u>	(A):Gross anatomy Endometrial polyp (B):Histopathological Endometrial polyp	9
<u>3</u>	(A): Gross anatomy Multiple leiomyomata (B):Histopathological Multiple leiomyomata	11
<u>4</u>	(A):Histopathological 'Typical Endometrial carcinoma' (B):Gross anatomy 'Typical Endometrial carcinoma'	13
<u>5</u>	Gross anatomy of Cervical Cancer	17
<u>6</u>	Histopathological Invasive squamous cell carcinoma: pleomorphic malignant cells, isolated or in clusters, sometimes keratinized or necrotic with bizarre cell shapes (arrow). Inflammation, blood and necrosis in the background	17
<u>7</u>	Histopathological Paget disease of the vulva	20
<u>8</u>	Histopathological ovarian adenocarcinoma	23
<u>9</u>	TVUS	24
<u>10</u>	Transvaginal probe	26
<u>11</u>	a:TVUS picture reveals the marker-dot pointed toward the ceiling b: TVUS/long.view show The entire uterine midline stripe	27
<u>12</u>	TVUS/long.view show The endometrial midline stripe	28
<u>13</u>	TVUS/long. plane reveals the normal EEC	30
<u>14</u>	Longitudinal view of Normal uterus & ovaries during transvaginal ultrasound	33

<u>No.</u>	<u>Figure</u>	<u>Page</u>
<u>15</u>	Sagittal endovaginal US image shows anteversion of the uterus (U) with extensive arcuate artery calcifications in 81-year-old woman with postmenopausal bleeding.	36
<u>16</u>	Transvaginal sonogram in longitudinal plane; reveals a very thin endometrium (arrowhead) measuring 2mm.(endometrial atrophy)	37
<u>17</u>	Transvaginal sonogram in longitudinal plane; reveals endometrial hyperplasia	38
<u>18</u>	Transvaginal sonogram in longitudinal plane; reveals endometrial polyp	39
<u>19</u>	TVUS in long. Plane ; reveals apolyp surrounded by fluid in the endocervical canal	39
<u>20</u>	Sagittal sonogram shows a posterior, fundal, 4.2 X 3.5-cm intramural uterine fibroid	40
<u>21</u>	Sonogram shows a subserosal, 2.3- to 2.5-cm, right anterior fundal uterine fibroid	40
<u>22</u>	Sagittal sonogram shows a heterogeneous but predominately hypoechoic posterior uterine fibroid	41
<u>23</u>	Sagittal transvaginal ultrasound image of the uterus shows a central mass replacing the endometrial stripe, with hyperechoic and hypoechoic regions; reveals poorly differentiated endometrial adenocarcinoma	43
<u>24</u>	Sagittal sonogram of clinical stage IIB cervical carcinoma. This image shows a diffusely enlarged cervix with heterogeneous echogenicity. The tumor margins are not clearly delineated, and the parametrial invasion is not obvious	44
<u>25</u>	This sagittal sonogram shows a circumscribed hypoechoic tumor(black stars) in the posterior aspect of the cervix	44

<u>No.</u>	<u>Figure</u>	<u>Page</u>
<u>26</u>	Transvaginal ultrasonogram shows the right ovary, which contains a cystic mass with a papillary protuberances (arrow). This finding is highly indicative of an ovarian neoplasm	47
<u>27</u>	Transvaginal, color Doppler ultrasonogram shows a solid mass in the left ovary. Low impedance flow is noted within this mass, which is a clear cell carcinoma of the ovary	47
<u>28</u>	MRI-Sag. View of Normal uterine anatomy	50
<u>29</u>	Postmenopausal uterus	50
<u>30</u>	MRI-Sag. View T2WI of Normal uterine anatomy in postmenopausal period shows Cervix with distinct zones	51
<u>31</u>	MRI-coronal plane shows Anatomy of the human female pelvis clearly shows both ovaries	52
<u>32</u>	MRI-Axial plane T2WI=show a small cystic structure arising from the left ovary in postmenopausal woman	53
<u>33</u>	Sagittal T2-weighted images of the female pelvis in midline (A) and paramidline (B) locations. The zonal anatomy of the uterus	54
<u>34</u>	Normal vaginal anatomy at MR imaging	55
<u>35</u>	Sagittal T2w MRI showing thinning (atrophy) of the endometrium	58
<u>36</u>	MRI-Sag. View/post contrast T1WI show the hyperplastic endometrium	59
<u>37</u>	MRI-Sag. View \T2WI reavel isointense structure/polyp arises from the posterior aspect of the uterus and protrudes into the cervix	60
<u>38</u>	Cervical polyp. (a) Sagittal T2-weighted MR image shows a large multicystic mass filling the endocervical canal (b) Sagittal T1-weighted MR image shows hypointense fluid filling the cysts	61

<u>No.</u>	<u>Figure</u>	<u>Page</u>
<u>39</u>	(a) MRI-Sag. View show well-circumscribed masses that have low T2 signals relative to the myometrium reveal leiomyoma (b) MRI-Sag. View/T1WI show the fibroid after gadolinium contrast administration	62
<u>40</u>	An 83-year-old woman with moderately differentiated endometrioid endometrial adenocarcinoma. Axial T1-weighted MR image of the uterus shows a multilobulated, low signal intensity, polypoid tumor	63
<u>41</u>	Sagittal T2-weighted MRI of stage IIB cervical cancer with parametrial and anterior vaginal fornix invasion	67
<u>42</u>	Sagittal T2-weighted magnetic resonance image of stage IB cervical cancer. This image shows a circumscribed, hyperintense mass in the posterior lip of the cervix	71
<u>43</u>	Malignant melanoma of the vagina with direct invasion of the cervix. (a) Sagittal T2-weighted MR image shows a hypointense tumor that involves the uterine cervix and vagina. (b) Sagittal T1-weighted MR image shows characteristic high signal intensity of the tumor	73
<u>44</u>	Gadolinium-enhanced magnetic resonance imaging (MRI) showed an irregular enhanced mass that invaded the bladder neck	74
<u>45</u>	A and B. Sequential coronal T2-weighted MRI of the pelvis in a patient with left ovarian carcinoma.	75
<u>46</u>	PIE Chart showing the Age distribution of the study group.	87
<u>47</u>	Column chart showing the causes of Postmenopausal bleeding in the study group.	88

List of Tables

<u>No.</u>	<u>Table</u>	<u>Page</u>
<u>1</u>	FIGO staging system of endometrial cancer	14
<u>2</u>	MRI staging of endometrial cancer according to FIGO classification	64
<u>3</u>	MRI staging of Cervical cancer according to FIGO classification	68
<u>4</u>	The Sequences used in the study	80
<u>5</u>	Age distribution of the study group	86
<u>6</u>	Causes of Postmenapausal bleeding in the study group	88
<u>7</u>	comparison of TVUS findings with pathological findings	89
<u>8</u>	Diagnostic parameters of TVUS	89
<u>9</u>	comparison of MRI findings with pathological findings	90
<u>10</u>	Diagnostic parameters of MRI	90

Abstract

Background: Postmenopausal bleeding: is a term of vaginal bleeding occurring after twelve months of amenorrhea, in a woman of the age where the menopause can be happened.

Transvaginal ultrasound scan (TVUS): is the best non invasive, first-line procedure to identify which women with PMB are at higher risk of endometrial tumor.

Aim of the Work: To study the sensitivity of MRI in comparison to Transvaginal ultrasonography in differentiation of underlying causes of postmenopausal bleeding.

Methodology: The study including 40 female patients with age ranged from 50-65 years old (mean age 55 ± 10.28) complaining of postmenopausal bleeding referred from the gynaecological clinic to the Radiology department. The study was conducted in the Ain Shams hospital during a period from January 2015 to May 2016.

Results: The study included 40 female patients with age range from 50-65 years (mean age 55 ± 10.28) who complained of postmenopausal bleeding referred from the gynaecological clinic to the Radiology department in Ain Shams hospital during a period from January 2015 to May 2016.

Conclusion: This large prospective implementation study shows: TVUS is a useful method for screening for endometrial abnormalities and we recommend its use in women with postmenopausal bleeding. Hence, unnecessary operations in postmenopausal women could be spared where the endometrium is ultrasonographically normal. While MRI is the superior diagnostic method to detect the myometrial invasion and cervical invasion. In other words, MRI can diagnose endometrial cancer in the early stage and may be a useful tool to guide the surgical approach, avoiding overtreating low-risk.

Keywords: Transvaginal Ultrasonography, MRI in Differentiation of the Underlying, Postmenopausal Bleeding



Introduction





Aim of the Work





Review of Literature





CHAPTER 1

Pathology of Different Causes of Postmenopausal Bleeding





CHAPTER 2

Normal Transvaginal Ultrasonographical Anatomy of Female Pelvis

