

Transvaginasonography in endometrial adenocarcinoma: a new therapeutic approach.

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Tumor grading, length of the uterine cavity, and depth of the myometrial invasion have been identified as important prognostic factors for endometrial adenocarcinoma. Recently, tumor volumes related to an enlarging uterine cavity have been investigated as one of the prognostic factors. We report a series of 15 cases of endometrial adenocarcinoma assessed with pre-operative transvaginasonography. The findings are described and the future roles of transvaginasonography in the management of endometrial adenocarcinoma is proposed and discussed.

It is advisable to carry out pre-operative ultrasonography for every post-menopausal woman. The ultrasonic findings, not only the depth of the myometrial invasion but also the length and width of the uterine cavity, are very promising in both the planning of treatment and prognosis of endometrial adenocarcinoma. We propose ultrasonography as a clinical procedure in the management of endometrial adenocarcinoma.

Key words: Transvaginasonography, Endometrial adenocarcinoma post-menopause.

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นอกจากการกำหนดระยะของโรคมะเร็งเยื่อบุโพรงมดลูกแล้ว ปัจจัยที่ใช้พยากรณ์โรคอื่น ๆ ได้แก่ เกรดของเซลล์มะเร็ง ขนาดของมดลูก ปริมาณของมะเร็งในโพรงมดลูก การกระจายมาที่คอมดลูก และการลุกลาม ชั้นกล้ามเนื้อมดลูก ถ้าพบว่ามีปัจจัยดังกล่าว ควรให้การรักษาหลาย ๆ วิธีร่วมกันได้แก่ การผ่าตัดร่วมกับการให้รังสีรักษา ผู้รายงานขอเสนอผลการตรวจด้วยคลื่นเสียงความถี่สูงทางช่องคลอด ในผู้ป่วยมะเร็งเยื่อบุโพรงมดลูก ระยะแรก จำนวน 15 รายที่ได้รับการผ่าตัดในโรงพยาบาลจุฬาลงกรณ์ตั้งแต่ปี พ.ศ. 2532-2533 พบว่านอกจากการวัดความหนาของเยื่อบุโพรงมดลูก ขนาดของมะเร็ง การตรวจการลุกลามชั้นกล้ามเนื้อ การแพร่กระจายมาที่คอมดลูก ตลอดจนการวัดขนาดของมดลูกด้วยคลื่นเสียงความถี่สูงทางช่องคลอดได้ผลถูกต้อง สามารถนำมาประกอบกับการประเมินเพื่อกำหนดระยะของโรคทางคลินิก เป็นข้อมูลที่มีประโยชน์เพื่อเลือกวิธีการรักษาให้เหมาะสม

Cancer of the endometrium is the most common genital malignancy seen in the United States; it ranks as the third most common in Chulalongkorn Hospital.⁽¹⁾ It seems to be one of the cancers with a rather good prognosis as simple hysterectomy and bilateral salpingoophorectomy are considered to be the treatments of choice for most cases. However, the 1985 Annual Report of FIGO⁽²⁾ (International Federation of Gynecologists and Obstetricians) reported only a 75% five-year survival rate for stage I endometrial adenocarcinoma. Thus, it is necessary to find a new investigation for more appropriate treatment and better outcome. Many investigators reported pelvic sonographic results in endometrial cancers using different approaches. Requard et al. studied the role of pelvic ultrasonography in clinical staging comparing between stages I, II, III and IV,⁽³⁾ but they did not mention other significant prognostic factors, such as myometrial invasion, while Fliescher et al. reported 70% accuracy in measuring the depth of myometrial invasion, but this was done via an abdominal approach.⁽⁴⁾

Transvaginal sonography is comparatively better than the abdominal approach in demonstrating an endometrial or myometrial echo pattern.⁽⁵⁾ However, since there are still no exclusive data concerning cancer of the endometrium, we conducted a study of transvaginal sonography in cases of endometrial

cancer seen at our oncology Unit, in Chulalongkorn Hospital. The aim of this study was to determine the sonographic appearance and document its accuracy for the prediction of variable prognostic factors: namely, myometrial invasion, tumor volume related to the depth of uterine sounding and endocervical tumor extension compared with surgical findings as a standard goal.

Material and Method

All cases entered in this study were diagnosed by fractional curettage. The interval from curettage to the performance of sonography was between seven and 28 days. Transvaginal ultrasonography (type 8538 and 1846 of Bruel and Kjaer 7 Mhz.) was used. After the bladders of patients were emptied, sonography was performed in longitudinal and transverse axis, endometrial thickness, its echogenicity, and tumor border related to the myometrium, which indicated invasion, were recorded. Total abdominal hysterectomy and bilateral salpingoophorectomy were performed. Then gross surgical specimens were bisected along the longitudinal axis similar to the proper scanning plane, tumor features were recorded, comparing both the sonographic findings and microscopic results.

Results

Table 1. Sonographic findings in 15 cases of endometrial cancer.

Case	Name	Stage	Sound Endometrium thickness	Cervical extension	Invasion	Tumor volume	
1	CWL	IAG1	7	29 mm	no	no	large
2	PIN	IBG1	10	35 mm	yes	no	large
3	ANG	IBG1	9	25 mm	no	no	large
4	EUC	IAG1	7	24 mm	no	no	large
5	MNI	IBG1	9	32 mm	no	less than 1/3	large
6	SVM	IAG1	7	30 mm	no	less than 1/3	large
7	HAA	IAG1	7	10 mm	no	no	small
8	NAN	IBG1	9	10 mm	no	no	small
9*	BSM	IBG1	14	54 mm	no	no	large
10**	LEE	IAG1	7	35 mm	no	deep	large
11	PNP	IAG1	7	10 mm	no	no	small
12	BSI	IBG2	10	13 mm	no	deep	small
13	PNE	IBG1	9	12 mm	no	no	small
14	LEG	IAG1	7	17 mm	no	less than 1/3	small
15	JUA	IAG1	7	15 mm	no	no	small

These 15 cases underwent pre-operative transvaginasonographic study prior to hysterectomy. Findings are presented in table 1 and some pictures are shown in figures 1-6. This study convinced us that transvaginally obtained images give a clear view of the endometrial echo. Even though there are no morphological features that are unique to a malignant endometrium, its thickness is quite reliably correlated with the pathological process. If the echoic borders are sharp or demarcated, this can suggest that there is no myometrial invasion (case numbers 3, 7, 9, 11, 12, 13, 14 and 15). There is disagreement between clinical FIGO staging regarding uterine size and tumor volume. There were five cases of stage IB (sound depth more than 8 cm), two of whom had small

tumor volume confirmed post-operatively. The enlarged uterus of these two cases can be explained by thickened myometrium or uterine hypertrophy, which should poses low risk for extrauterine extension.

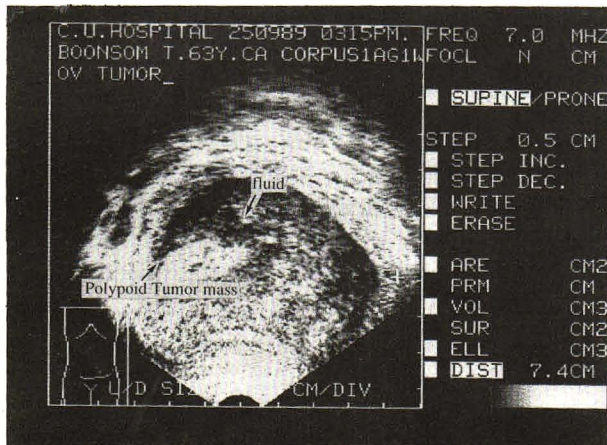


Figure 1. The cavity was expanded. A large polypoid tumor located at the fundus surrounded by fluid which was hypoechoic. Surgical specimen confirmed to be an endometrial polypoid carcinoma and Pyometra.

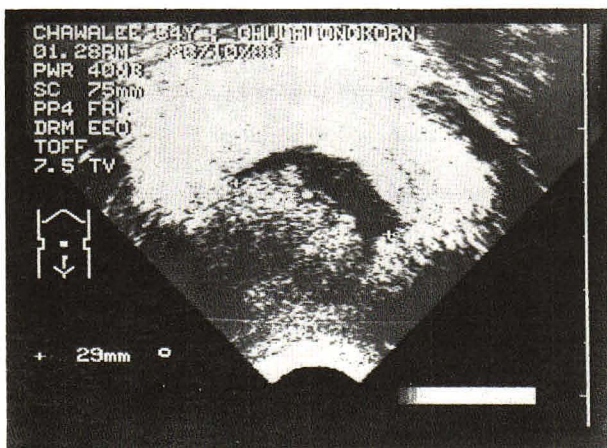


Figure 2. A hyperechoic polypoid mass noted at posterior uterine cavity. Its thickness was 29 mm. proved to be endometrial carcinoma.

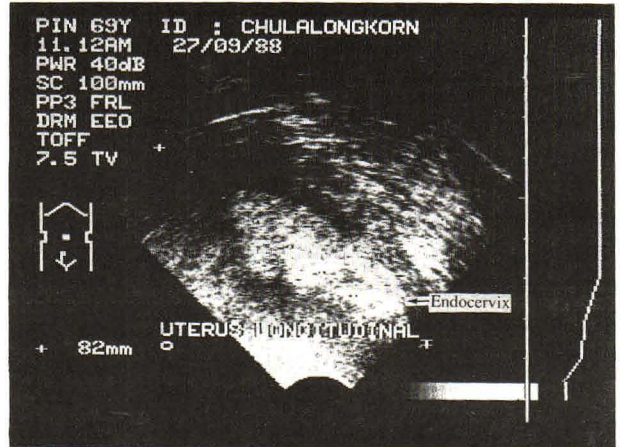


Figure 3. -Noted the endometrial echo extended to endocervix and filled whole uterine cavity. See Fig.4

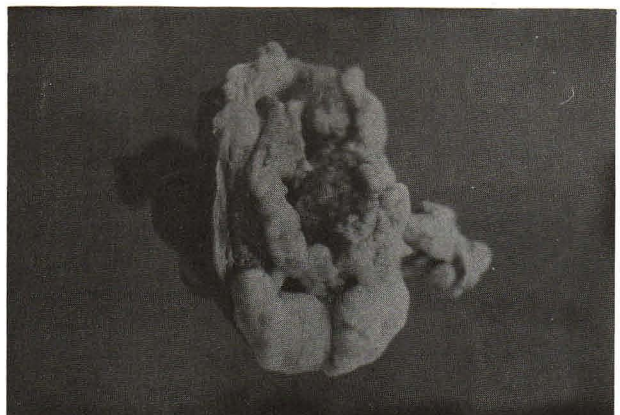


Figure 4. This was a surgical specimen showed a large tumor volume filled whole cavity and extended to level of endocervix.

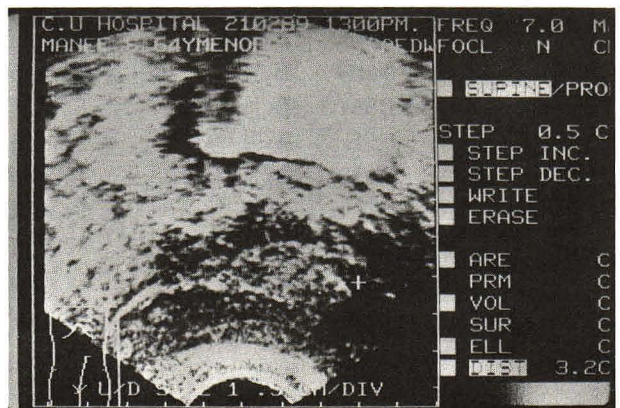


Figure 5A. Noted a thickened endometrial echo.

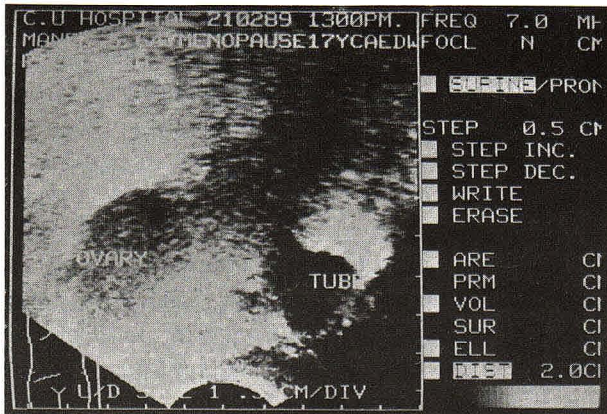


Figure 5B. Unexpected ovarian tumor was detected.



Figure 6. During surgery, an ovarian tumor was confirmed. Noted a small polypoid tumor (arrow)

Table 2.

		Microscopic diagnosis	
		no invasion	deep invasion
Sonographic Diagnosis	no*	13	1
	deep	0	1

* less than 1/3 of invasion (microscopically) was included in the group with no invasion, since they were considered clinically at low risk for pelvic or aortic node metastasis.

Discussion

The incidence of cancer of the uterine cervix has been declining for the past 10 years owing to the worldwide "Pap smear" campaign. Endometrial cancer, which as a pre-invasive disease cannot be diagnosed, became the most common malignant disease found in the United States. Dilatation and curettage is still a standard diagnostic tool.^(6,7) While the FIGO staging system is used to classify all cancer cases, the degree of myometrial invasion is not incorporated within this system.⁽⁸⁾ The post-operative surgical finding of "myometrial invasion" is well documented as a significant prognostic factor. Lewis et al. reported a clinical correlation between the depth of myometrial invasion and the risk of pelvic node metastasis.⁽⁹⁾ Recurrence and mortality were also increased in this group. Boutselis⁽¹⁰⁾ found that deep myometrial invasion correlated with 43% of pelvic lymph node metastasis and 21% of paraortic node metastasis;⁽¹¹⁾ the recurrence rate was 48%.⁽¹²⁾ Tumor volume, which causes endometrial cavity

expansion and uterine enlargement as measured by uterine sounding, is also among the worst prognostic factors.⁽¹³⁾

The hallmark of this study is the accuracy of transvaginal sonography in predicting tumor volume. Fleischer et al. studied 20 cases of cancers and reported that abdominal ultrasonography was capable of measuring the depth of invasion rather accurately (70%). The demonstration of a well-defined outline of the endometrial echo (hyperechoic rim) can be interpreted as meaning that there is no invasion. The difference between tissue density of the compact and vascular layers of the endometrium and myometrium yield sound reflections; thus the basal layer and the muscular layer will give different echogenicity compatible with this hyperchoic rim. In contrast with pelvic sonography, transvaginal sonography showed a better-defined endometrial echo outline owing to the close proximity of the vaginal probe to the uterus. If the hyperechogenic rim of the endometrial echo border is sharp or well defined, it will

correlate well with the post-operative finding that there was no invasion. If the border is irregular, the possibility of a deep invasion will be high. It also can demonstrate tumor location, whether it is at the uterine fundus or extended to the level of the isthmus. Estimation of tumor volume is also possible, which provides valuable information for clinicians as a prognostic factor.⁽¹⁴⁾ These data should assist clinicians in determining FIGO staging and treatment planning. Primary hysterectomy is a standard treatment for stage IAG1. While pre-operative radiation followed by hysterectomy is preferred for cases other than this (stage IA, grade 2 or 3 and IB cases) for the reason that there may be increased incidence of deep myometrial invasion, which fortunately is not always true. Many stage IB cases have no myometrial invasion; many investigators have confirmed the unnecessary administration of pre-operative radiation in these low-risk cases (grades 1 or 2 without myometrial involvement) in terms of recurrence or survival. This study has demonstrated the role of transvaginal sonography in determining tumor volume and detecting myometrial invasion so that primary surgery for low-risk cases can be performed or pre-operative radiotherapy can be given for those cases in whom deep myometrial involvement have been demonstrated. With regard to prognostic factors, Baram also agreed that myometrial invasion was considered to be more important than uterine size.

The 15 cases of endometrial cancer who were enrolled in this study had primary hysterectomy performed in Chulalongkorn Hospital. Then sonographic findings were compared with the pathological results. There were two cases with deep myometrial invasion. One of the two could be detected by sonography; the other had a false-negative diagnosis, but if the degree of invasion was determined by inspection only, it would have seemed to be confined to the endometrium, which indicates that the sonographic image correlated with the gross finding but not with the microscopic finding. While tumor volume can be reliably estimated in comparison with the gross finding, we had one case of clinical endocervical tumor extension and another of large uterine size due to pyometra, both of which were correctly diagnosed. One unsuspected ovarian dermoid cyst was also diagnosed pre-operatively. In estimating the size of the uterus by uterine sounding during the procedure of fractional curettage, we observed that three out of seven cases had no myometrial invasion. There would be no advantage to be gained from providing pre-operative radiation prior to surgery in those cases.

In summary, as we gain more expertise in transvaginal sonography, we are confident that this form of investigation should be included as part of the scheme for pre-operative evaluation. Then for low-risk cases, as previously discussed, an appropriate choice can be made whether to perform primary hysterectomy, which is currently advocated by many oncologists as a management procedure for endometrial cancer. Further roles of transvaginal sonography have to be elucidated not only in pre-operative evaluation but also for screening purposes in the detection of endometrial cancer.

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