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3D ultrasound for diagnosing endometrial cancer/post-menopausal bleeding

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(3D OR 3-D OR 3d OR "three dimension"), (ultrasound* OR ultrasonograph* OR sonograph* OR sonogram*), (endometrium OR endometrial OR uterine OR uterus* OR womb*), (tumor* OR tumour* OR oncolog* OR cancer* OR malignan* OR carcinoma*)

Published Research – Databases

Value of three dimensional power Doppler ultrasound in prediction of endometrial carcinoma in patients with postmenopausal bleeding.

Author(s) Hanafi S, Abou-Gabal A, Akl S, El Baset HA

Citation: Journal of the Turkishgerman Gynecological Association, 2014, vol./is. 15/2(78-81), 1309-0399;1309-0380 (2014)

Publication Date: 2014

Abstract: OBJECTIVE: To determine whether endometrial volume or power Doppler indices measured by 3-dimensional (3D) ultrasound imaging can discriminate between benign and malignant endometrium in women with postmenopausal bleeding and endometrial thickness >5 mm.MATERIAL
AND METHODS: The current diagnostic accuracy study was conducted at Ain Shams University Maternity Hospital. Eighty-four patients with postmenopausal bleeding and endometrial thickness >5 mm underwent 3D power Doppler ultrasound examination of the corpus uteri. The endometrial volume was calculated, along with the vascularization index (VI), flow index (FI), and vascularization flow index (VFI) in the endometrium. The gold standard was the histopathological diagnosis of the endometrium.

RESULTS: Of the 84 women included in the study, 56 (66.7%) had benign endometrial lesions, and 28 (33.3%) had malignant endometrial lesions. Endometrial thickness, endometrial volume, and flow indices (VI, FI, and VFI) were higher in patients with malignant endometrium than those with benign endometrium. The area under the receiver operator characteristic curve (AUC) of endometrial thickness was 0.83, that of endometrial volume was 0.73, and that of the best power Doppler variable, FI, was 0.93. The best logistic regression model for predicting malignancy contained the variables endometrial thickness and FI; its AUC was 0.93.

CONCLUSION: The diagnostic performance of endometrial volume measured by 3D imaging with regard to discriminating between benign and malignant endometrium was not superior to that of endometrial thickness measured by 2D ultrasound examination, but 3D power Doppler flow indices are good diagnostic tools in predicting endometrial carcinoma.

Source: Medline
Available in fulltext from Journal of the Turkish German Gynecological Association at National Library of Medicine

Three-dimensional power Doppler and endometrial volume as predictors of malignancy in patients with postmenopausal bleeding.

Author(s) Makled AK, Elmekkawi SF, El-Refaie TA, El-Sherbiny MA
Citation: Journal of Obstetrics & Gynaecology Research, May 2013, vol./is. 39/5(1045-51), 1341-8076;1447-0756 (2013 May)
Publication Date: May 2013

Abstract: AIM: The aim of this study was to evaluate the efficacy of 3D power Doppler angiography (3D-PDA) for distinguishing between benign endometrial lesions and endometrial carcinoma in patients with postmenopausal bleeding (PMB).

MATERIAL AND METHODS: One-hundred and fifty women with PMB and an endometrial thickness (ET) of >4mm on 2D sonography were assessed by 3D-PDA before endometrial sampling to obtain definitive histological diagnosis of endometrial pathology. Endometrial volume (EV), vascularity index (VI), flow index (FI) and vascularity-flow index (VFI) were calculated by computer-aided analysis.

RESULTS: Of the 150 women, 114 (76%) had benign endometrial lesions and 36 (24%) had endometrial carcinoma. Patients with endometrial carcinoma had significantly thicker endometrium (15.8+/−7.7 vs 9.9+/−5.9mm; P<0.001), larger EV (9.1+/−4.7 vs 2.6+/−3.5mL, P<0.001) and higher 3D-PDA indices (P<0.001) than patients with benign endometrial lesions. The best variable for distinguishing between benign and malignant endometrium was VI, with an area under the receiver operating characteristic curve (AUC) of 0.86. In contrast, the ET had an AUC of only 0.62. The best-fit logistic regression model for the diagnosis malignancy contained only VI as an independent factor (P=0.002).

CONCLUSION: 3D-PDA measurements may be useful for distinguishing between benign endometrial lesions and endometrial carcinoma in patients with postmenopausal bleeding.

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Measuring the volume of uterine fibroids using 2- and 3-dimensional ultrasound and comparison with histopathology.

Author(s): Zivkovic N, Zivkovic K, Despot A, Paic J, Zelic A

Citation: Acta Clinica Croatica, December 2012, vol./is. 51/4(579-89), 0353-9466;0353-9466 (2012 Dec)

Publication Date: December 2012

Abstract: The aim of this study was clinical testing of the reliability and usability of three-dimensional (3D) and two-dimensional (2D) ultrasound (US) technology. The ultimate aim and purpose of this study was to establish ultrasound methods, standards and protocols for determining the volume of any gynecologic organ or tumor. The study included 31 women in reproductive age and postmenopause. All patients were examined with a RIC 5-9 3D-endovaginal probe (4.3-7.5 MHz) on a Voluson 730 Pro ultrasound device. The volume of myomas was measured by using the existing 2D and 3D ultrasound methods on the above mentioned device. All patients underwent myomectomy or hysterectomy due to clinically and ultrasonographically diagnosed uterine myomas indicating operative intervention. After the operation, the pathologist determined the volume of removed myomas by measuring them in a gauge bowl containing water, i.e. using Archimedes' principle (lift), serving as the control group with histopathologic diagnosis. A total of 155 myoma volumes were processed on 2D display, 31 myoma volumes were preoperatively measured on 3D display and 31 myoma volumes were measured by the pathologist. The values of US measurements for each US method were expressed as mean value of all measurements of myoma volumes. Statistical processing of the results and Student's t-test for independent samples revealed that the 2nd examined US method (measuring of myoma by using an ellipse and the longer tumor diameter) and 4th examined US method (measuring of myoma by using the longer and shorter tumor diameters together with establishing their mean values) in 2D US technique, as well as the 6th examined US method in 3D US technique showed no significant measurement differences in comparison with control measurement in a gauge bowl containing water (p < 0.05), indicating acceptability of the US methods for verifying tumor volumes. The standard error in determining the volume of myomas by the above US methods varied between 15% and 25%, so it is concluded that these three methods can be used in clinical practice to determine tumor volumes, in this case uterine myomas. The 3D MultiPlane method proved to be the most reliable method of determining the volume of uterine myomas.

Source: Medline

Available in fulltext from Acta Clinica Croatica at Free Access Content

Detection of intracavitary uterine pathology using offline analysis of three-dimensional ultrasound volumes: interobserver agreement and diagnostic accuracy.

OBJECTIVE: To estimate the diagnostic accuracy and interobserver agreement in predicting intracavitary uterine pathology at offline analysis of three-dimensional (3D) ultrasound volumes of the uterus.

METHODS: 3D volumes (unenhanced ultrasound and gel infusion sonography with and without power Doppler, i.e. four volumes per patient) of 75 women presenting with abnormal uterine bleeding at a 'bleeding clinic' were assessed offline by six examiners. The sonologists were asked to provide a tentative diagnosis. A histological diagnosis was obtained by hysteroscopy with biopsy or operative hysteroscopy. Proliferative, secretory or atrophic endometrium was classified as 'normal' histology; endometrial polyps, intracavitary myomas, endometrial hyperplasia and endometrial cancer were classified as 'abnormal' histology. The diagnostic accuracy of the six sonologists with regard to normal/abnormal histology and interobserver agreement were estimated.

RESULTS: Intracavitary pathology was diagnosed at histology in 39% of patients. Agreement between the ultrasound diagnosis and the histological diagnosis (normal vs abnormal) ranged from 67 to 83% for the six sonologists. In 45% of cases all six examiners agreed with regard to the presence/absence of intracavitary pathology. The percentage agreement between any two examiners ranged from 65 to 91% (Cohen's kappa, 0.31-0.81). The Schouten kappa for all six examiners was 0.51 (95% CI, 0.40-0.62), while the highest Schouten kappa for any three examiners was 0.69.

CONCLUSION: When analyzing stored 3D ultrasound volumes, agreement between sonologists with regard to classifying the endometrium/uterine cavity as normal or abnormal as well as the diagnostic accuracy varied substantially. Possible actions to improve interobserver agreement and diagnostic accuracy include optimization of image quality and the use of a consistent technique for analyzing the 3D volumes.

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Source: Medline
Available in fulltext from Ultrasound in Obstetrics and Gynecology at Wiley
values obtained using the 9degree or the 30degree angle. Receiver-operating characteristics curves were traced for all indices. The vascularity index had the best area under the curve (0.78), 77.8% sensitivity, and 82.6% specificity. The areas under the curve were smaller for the shell than for the endometrium.CONCLUSION: 3D-PDA was not found better than 2D ultrasound at distinguishing benign from malignant disease in women with AUB and an endometrial thickness greater than 4.5mm. Copyright 2012 International Federation of Gynecology and Obstetrics. Published by Elsevier Ireland Ltd. All rights reserved.

Source: Medline

Gray-scale and color Doppler ultrasound characteristics of endometrial cancer in relation to stage, grade and tumor size.


Citation: Ultrasound in Obstetrics & Gynecology, November 2011, vol./is. 38/5(586-93), 0960-7692;1469-0705 (2011 Nov)

Publication Date: November 2011

Abstract: OBJECTIVES: To describe the gray-scale and vascular characteristics of endometrial cancer in relation to stage, grade and size using two-dimensional (2D)/three-dimensional (3D) transvaginal ultrasound. METHODS: This was a prospective multicenter study including 144 women with endometrial cancer undergoing transvaginal ultrasound before surgery. The sonographic characteristics assessed were echogenicity, endometrial/myometrial border, fibroids, vascular pattern, color score and tumor/uterus anteroposterior (AP) ratio. Histological assessment of tumor stage, grade, type and growth pattern was performed. RESULTS: Hyperechoic or isoechoic tumors were more often seen in Stage IA cancer, whereas mixed or hypoechoic tumors were more often found in cancers of Stage IB or greater (P = 0.003). Hyperechogenicity was more common in Grade 1-2 tumors (i.e. well or moderately differentiated) (P = 0.02) and in tumors with a tumor/uterine AP ratio of < 50% (P = 0.002), whereas a non-hyperechoic appearance was more commonly found in Grade 3 tumors (i.e. poorly differentiated) and in tumors with a tumor/uterine AP ratio of > 50%. Multiple global vessels were more often seen in tumors of Stage IB or greater than in Stage IA tumors (P = 0.02), in Grade 3 tumors than in Grade 1 and 2 tumors (P = 0.02) and in tumors with a tumor/uterine AP ratio of > 50% (P < 0.001). A moderate/high color score was significantly more common in tumors of higher stage (P = 0.03) and larger size (P = 0.001). CONCLUSION: The sonographic appearance of endometrial cancer is significantly associated with tumor stage, grade and size. More advanced tumors often have a mixed/hypoechoic echogenicity, a higher color score and multiple globally entering vessels, whereas less advanced tumors are more often hyperechoic and have no or a low color score. Copyright 2011 ISUOG. Published by John Wiley & Sons, Ltd.

Source: Medline

Available in fulltext from Ultrasound in Obstetrics and Gynecology at Wiley

Three-dimensional ultrasound for assessing women with gynecological cancer: a systematic review.

Author(s) Alcazar JL, Jurado M

Citation: Gynecologic Oncology, March 2011, vol./is. 120/3(340-6), 0090-
GOALS: Three-dimensional ultrasound (3D-US) is a new imaging technique that has become available in clinical practice. It is being increasingly used in women with gynecological cancer. The goal of this article is to review critically current evidence of the role of this technique in this clinical setting.

METHODS: Through Medline search (2001-2010) 46 studies using 3D-US in women with gynecological cancer were identified (28 studies involving ovarian cancer, 15 studies involving endometrial cancer and 6 studies involving cervical cancer). A systematic review of these studies was performed.

RESULTS: Most studies were prospective and observational. Series were small in most of them. Ten studies addressed technical and reproducibility issues. All of them demonstrate that 3D-US is a reproducible technique among examiners. Studies involving ovarian cancer showed that gray-scale 3D-US is not superior to conventional 2D-US for predicting ovarian cancer. Tumor vascular assessment by 3D power Doppler showed that this method might be useful in a selected subset of adnexal masses. Studies involving endometrial cancer showed that endometrial volume estimation is more specific than endometrial thickness measurement for predicting endometrial cancer. This method is useful for determining myometrial infiltration in women with endometrial cancer. The role of 3D power Doppler in endometrial cancer is controversial. Studies involving cervical cancer showed that tumor vascularity as assessed by 3D power Doppler correlates with prognostic tumor features.

CONCLUSIONS: Three-dimensional ultrasound is a new imaging technique that offers unique ways for assessing women with gynecologic cancer. Current evidence shows that it is reproducible. It might be useful in some clinical circumstances. Further studies are needed to establish its role in clinical practice in gynecologic oncology.

Source: Medline

Three-dimensional ultrasound imaging for discrimination between benign and malignant endometrium in women with postmenopausal bleeding and sonographic endometrial thickness of at least 4.5 mm.

Author(s) Opolskiene G, Sladkevicius P, Jokubkiene L, Valentin L

Citation: Ultrasound in Obstetrics & Gynecology, January 2010, vol./is. 35/1(94-102), 0960-7692;1469-0705 (2010 Jan)

Abstract: OBJECTIVES: To determine whether endometrial volume or power Doppler indices as measured by three-dimensional (3D) ultrasound imaging can discriminate between benign and malignant endometrium, to compare their diagnostic performance with that of endometrial thickness measurement using two-dimensional (2D) ultrasound examination, and to determine whether power Doppler indices add any diagnostic information to endometrial thickness or volume.

METHODS: Sixty-two patients with postmenopausal bleeding and endometrial thickness > or = 4.5 mm underwent transvaginal 2D gray-scale and 3D power Doppler ultrasound examination of the corpus uteri. The endometrial volume was calculated, along with the vascularization index (VI), flow index and vascularization flow index (VFI) in the endometrium and in a 2-mm 'shell' surrounding the endometrium. The 'gold standard' was the histological diagnosis of the endometrium obtained by hysteroscopic resection of focal lesions, dilatation
and curettage or hysterectomy. Receiver-operating characteristics (ROC) curves were drawn for all measurements to evaluate their ability to distinguish between benign and malignant endometrium. Multivariate logistic regression analysis was used to create mathematical models to estimate the risk of endometrial malignancy.

**RESULTS:** There were 49 benign and 13 malignant endometria. Endometrial thickness and volume were significantly larger in malignant than in benign endometria, and flow indices in the endometrium and endometrial shell were significantly higher. The area under the ROC curve (AUC) of endometrial thickness was 0.82, that of endometrial volume 0.78, and that of the two best power Doppler variables (VI and VFI in the endometrium) 0.82 and 0.82. The best logistic regression model for predicting malignancy contained the variables endometrial thickness (odds ratio 1.2; 95% CI, 1.04-1.30; \( P = 0.004 \)) and VI in the endometrial 'shell' (odds ratio 1.1; 95% CI, 1.02-1.23; \( P = 0.01 \)). Its AUC was 0.86. Using its mathematically optimal risk cut-off value (0.22), the model correctly classified seven more benign cases but two fewer malignant cases than the best endometrial thickness cut-off (11.8 mm). Models containing endometrial volume and flow indices performed less well than did endometrial thickness alone (AUC, 0.79 vs. 0.82).

**CONCLUSIONS:** The diagnostic performance for discrimination between benign and malignant endometrium of 3D ultrasound imaging was not superior to that of endometrial thickness as measured by 2D ultrasound examination, and 3D power Doppler imaging added little to endometrial thickness or volume.

**Source:** Medline
Available in fulltext from *Ultrasound in Obstetrics and Gynecology* at Wiley

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**Two- and three-dimensional saline contrast sonohysterography: interobserver agreement, agreement with hysteroscopy and diagnosis of endometrial malignancy.**

**Author(s)** Opolskiene G, Sladkevicius P, Valentin L

**Citation:** Ultrasound in Obstetrics & Gynecology, May 2009, vol./is. 33/5(574-82), 0960-7692;1469-0705 (2009 May)

**Publication Date:** May 2009

**Abstract:** OBJECTIVES: The aims of our study were to compare the interobserver reproducibility of two-dimensional (2D) and three-dimensional (3D) saline contrast sonohysterography (SCSH) and agreement of these techniques with hysteroscopy, and to determine which SCSH findings best discriminate between benign and malignant endometrium.

**METHODS:** Consecutive women with postmenopausal bleeding and endometrial thickness \( \geq 4.5 \) mm underwent 2D and 3D SCSH; the results were videotaped and stored electronically, respectively, for analysis by two independent experienced examiners who were blinded to each other’s results. A histological diagnosis was obtained by dilatation and curettage, hysteroscopic resection or hysterectomy. The hysteroscopist was blinded to the ultrasound results and used the same standardized research protocol to describe the uterine cavity as the ultrasound examiners.

**RESULTS:** Of 170 consecutive women with postmenopausal bleeding and endometrial thickness \( \geq 4.5 \) mm, 84 (14 with endometrial malignancy) fulfilled our inclusion criteria. Hysteroscopy findings in 54 women (one with endometrial malignancy) were used to determine agreement with SCSH. Interobserver agreement of 2D and 3D SCSH was 95% (80/84) vs. 89% (75/84) with regard to presence of focal lesions, 89% (75/84) vs. 88% (74/84) for presence of focal lesions with irregular surface, 67% (54/81) vs. 63%
(51/81) for number of focal lesions, and 77% (46/60) vs. 70% (42/60) for location of focal lesions. The agreement between 2D and 3D SCSH and hysteroscopy was 94% (51/54) vs. 93% (50/54) with regard to presence of focal lesions, 74% (40/54) vs. 76% (41/54) for presence of focal lesions with irregular surface, 63% (34/54) vs. 54% (29/54) for number of focal lesions, and 66% (29/44) vs. 64% (28/44) for location of focal lesions. The SCSH finding that best discriminated between benign and malignant endometrium was the presence of focal lesion(s) with irregular surface (for 2D SCSH: sensitivity 71%, specificity 97%, positive likelihood ratio 25, negative likelihood ratio 0.3; for 3D SCSH: sensitivity 43%, specificity 97%, positive likelihood ratio 15, negative likelihood ratio 0.6).CONCLUSIONS: 3D SCSH does not seem to be superior to 2D SCSH when performed by experienced ultrasound examiners either with regard to reproducibility, agreement with hysteroscopy findings or diagnosis of endometrial malignancy. The presence of focal lesion(s) with irregular surface is the best SCSH variable for discrimination between benign and malignant endometrium.

Source: Medline
Available in fulltext from Ultrasound in Obstetrics and Gynecology at Wiley

Assessing myometrial infiltration by endometrial cancer: uterine virtual navigation with three-dimensional US.

Author(s) Alcazar JL, Galvan R, Albela S, Martinez S, Pahisa J, Jurado M, Lopez-Garcia G

Citation: Radiology, March 2009, vol./is. 250/3(776-83), 0033-8419;1527-1315 (2009 Mar)

Publication Date: March 2009

Abstract: PURPOSE: To describe and analyze the diagnostic performance of uterine virtual navigation with three-dimensional (3D) ultrasonography (US) for the assessment of the depth of myometrial infiltration by endometrial cancer.MATERIALS AND METHODS: Institutional review board approval was obtained; patients gave oral informed consent. Women with endometrial cancer were evaluated by using 3D US prior to surgical staging. A 3D volume of the whole uterus was obtained and analyzed by using software. Virtual navigation through three orthogonal planes was performed to identify the shortest myometrial tumor-free distance to serosa (TDS) by analyzing the lateral, anterior, posterior, and fundal portions of the myometrium. Myometrial infiltration was also assessed by subjective impression of an examiner. Histologic findings of myometrial infiltration and TDS measured by a pathologist were used as the reference standard. A receiver operating characteristic curve was plotted to identify the best cutoff for TDS for identifying myometrial infiltration of 50% or more.RESULTS: Ninety-six women (mean age, 61.8 years; range, 31-86 years) with endometrial cancer were included in the study. At histologic analysis, myometrial invasion was found to be less than 50% in 69 (72%) cases and 50% or more in 27 (28%) cases. TDS measured with US was positively correlated with histologically measured TDS (r = 0.649; 95% confidence interval: 0.52, 0.76). The best cutoff for US-measured TDS was 9.0 mm (sensitivity, 100%; specificity, 61%; negative predictive value, 100%; positive predictive value, 50%). Subjective impression had a sensitivity of 92.6%, a specificity of 82.3%, a negative predictive value of 96.6%, and a positive predictive value of 67.7%.CONCLUSION: Uterine virtual navigation with 3D US is a reliable method for the assessment of myometrial infiltration in patients with endometrial cancer.Copyright RSNA, 2009
Three-dimensional power Doppler ultrasound scanning for the prediction of endometrial cancer in women with postmenopausal bleeding and thickened endometrium.

Author(s): Alcazar JL, Galvan R
Citation: American Journal of Obstetrics & Gynecology, January 2009, vol./is. 200/1(44.e1-6), 0002-9378;1097-6868 (2009 Jan)
Publication Date: January 2009
Abstract: OBJECTIVE: The purpose of this study was to evaluate the role of 3-dimensional power Doppler angiography (3D-PDA) to discriminate between benign and malignant endometrial disease in women with postmenopausal bleeding and thickened endometrium.STUDY DESIGN: Ninety-nine postmenopausal women (median age, 63.1 years; range, 48-84 years) with uterine bleeding and a thickened endometrium (≥5 mm) at baseline transvaginal sonography were assessed by 3D-PDA before endometrial biopsy. Endometrial volume, vascularity index (VI), flow index, and vascularity-flow index were calculated with the virtual organ computer-aided analysis method.RESULTS: Histologic diagnoses were endometrial cancer (44 cases), hyperplasia (13 cases), polyp (23 cases), cystic atrophy (14 cases), and submucous myoma (5 cases). Endometrial volume, VI, and vascularity-flow index were significantly higher in malignant vs benign conditions. Receiver operating characteristic analysis revealed that VI was the best parameter for the prediction of endometrial cancer.CONCLUSION: The findings show that 3D-PDA may be useful for the prediction of endometrial cancer in women with postmenopausal bleeding and thickened endometrium at baseline sonography.
Source: Medline

The role of three-dimensional volume measurement in diagnosing endometrial cancer in patients with postmenopausal bleeding.

Author(s): Yaman C, Habelsberger A, Tews G, Polz W, Ebner T
Citation: Gynecologic Oncology, September 2008, vol./is. 110/3(390-5), 0090-8258;1095-6859 (2008 Sep)
Publication Date: September 2008
Abstract: OBJECTIVE: To evaluate the role of three-dimensional transvaginal ultrasound in diagnosing endometrial cancer in patients with history of postmenopausal bleeding and compare its effectiveness with two-dimensional ultrasound.METHODS: Transvaginal ultrasound examinations, diagnostic hysteroscopy with subsequent curettage, and/or hysterectomy were performed in 213 consecutive patients with a history of postmenopausal bleeding. The results of the ultrasonographic examinations were compared with the diagnoses on the basis of histologic examination. In addition to an explorative data analysis, receiver operating characteristic curves were shown and areas under curves were calculated. Minimal endometrial volume (2.7 ml) and minimal endometrial thickness (7 mm) of endometrial carcinoma were defined as optimal cutoff values.RESULTS: In 42 patients, endometrial carcinoma was diagnosed. The mean endometrial volume of patients with endometrial cancer, measured by three-dimensional
ultrasound, was 11.78 ml. The sensitivity of the endometrial volume at the optimal cutoff (2.7 ml) was 100.00%, the specificity was 69.00%, the positive predictive value was 44.20%, and the negative predictive value was 100.00%. On two-dimensional ultrasound, the mean endometrial thickness of patients with endometrial cancer was 16.6 mm. The sensitivity endometrial thickness measurements at the optimal cutoff (7 mm) was 100.00%, the specificity was 43.3%, the positive predictive value was 30.2%, and the negative predictive value was 100.00%. The area under curve of volume measured by three-dimensional ultrasound was 0.89 (95% CI 0.85-0.93). The area under curve of endometrial thickness was 0.85 (95% CI 0.80-0.91). The comparison of the area under curve of receiver operating curves between endometrial volume and endometrial thickness revealed a significant difference (p=0.023).

CONCLUSION: Volume measurement by three-dimensional transvaginal ultrasound has a higher specificity, which means that it has the ability to better identify the negative cases compared to conventional ultrasound. Three-dimensional transvaginal ultrasound is a helpful tool for diagnosing endometrial cancer in patients with postmenopausal bleeding.

Source: Medline

The Role of 2D, 3D ultrasound and color doppler in the diagnosis of benign and malignant endometrial lesions.

Author(s) Hosny IA, Elghawabit HS, Mosaad MM

Citation: Journal of Egyptian National Cancer Institute, December 2007, vol./is. 19/4(275-81), 1110-0362;1110-0362 (2007 Dec)

Publication Date: December 2007

Abstract: Forty eight female patients, 15 in the child-bearing period, 6 pre-and 27 postmenopausal, with ages ranging from 35 to 78 years, presented with abnormal uterine bleeding. They were subjected to 2D, 3D ultrasound and Doppler studies. The combined use of ultrasound and Doppler was highly suggestive in the diagnosis of 19 cases of submucous leiomyoma, 16 cases of endometrial hyperplasia, 9 cases of endometrial carcinoma and 4 cases of endometrial polyp, with overall sensitivity and specificity of 93.75 % and 81.25 % respectively. The diagnosis of 35 cases was established by D&C or hysteroscopy and biopsy. The remaining 8 cases were highly suggestive of submucous leiomyomata by ultrasound and color Doppler; the patients refused invasive procedures and were followed after 6 months with no significant changes. Key Words : 2D, 3D ultrasound - Color doppler - Endometrial lesions.

Source: Medline

Clinical usefulness of 3-dimensional sonography and power Doppler angiography for diagnosis of endometrial carcinoma.

Author(s) Mercé LT, Alcazar JL, Lopez C, Iglesias E, Bau S, Alvarez de los Heros J, Bajo JM

Citation: Journal of Ultrasound in Medicine, October 2007, vol./is. 26/10(1279-87), 0278-4297;0278-4297 (2007 Oct)

Publication Date: October 2007

Abstract: OBJECTIVE: The purpose of this study was to assess whether endometrial volume (EV) and 3-dimensional (3D) power Doppler indices can discriminate between hyperplasia and endometrial carcinoma and can predict extension of the endometrial carcinoma.METHODS: Eighty-four women with uterine bleeding and a histopathologic diagnosis of endometrial
hyperplasia (n = 29) or carcinoma (n = 55) were preoperatively examined by transvaginal 3D sonography and power Doppler angiography. Endometrial thickness (ET), EV, the vascularization index (VI), the flow index (FI), the vascularization-flow index (VFI), and the intratumoral resistive index (RI) were measured. A histopathologic diagnosis was made after endometrial biopsy was performed by hysteroscopy or curettage.

RESULTS: The EV and 3D power Doppler indices (VI, FI, and VFI) were significantly higher in endometrial carcinoma than endometrial hyperplasia, whereas the intratumoral RI was significantly lower (P < .05). A VFI of 2.07 was the best cutoff for predicting endometrial carcinoma, with sensitivity of 76.5% and specificity of 80.8%. No significant differences were noticed for ET. The endometrial VI was significantly higher when the tumor stage was greater than I. All the 3D power Doppler indices were significantly higher when the carcinoma infiltrated more than 50% of the myometrium. The intratumoral RI was significantly lower in cases with a high histologic grade, myometrial infiltration of more than 50%, and lymph node metastases.

CONCLUSIONS: The VI, 3D power Doppler indices, and the intratumoral RI are more useful than ET for differentiating between hyperplasia and endometrial carcinoma. Intratumoral blood flow evaluated by pulsed Doppler sonography and 3D power Doppler angiography can predict the spread of endometrial carcinoma.

Source: Medline
Available in fulltext from Journal of Ultrasound in Medicine at Highwire Press

Three-dimensional transvaginal ultrasound provides clearer delineation of myometrial invasion in a patient with endometrial cancer and uterine leiomyoma.

Author(s) Su MT, Su RM, Yue CT, Chou CY, Hsu CC, Chang FM
Citation: Ultrasound in Obstetrics & Gynecology, October 2003, vol./is. 22/4(434-6), 0960-7692:0960-7692 (2003 Oct)
Publication Date: October 2003
Source: Medline
Available in fulltext from Ultrasound in Obstetrics and Gynecology at Wiley

Ultrasonic assessment of the postmenopausal uterus.

Author(s) Kupesic S, Kurjak A, Hajder E
Citation: Maturitas, April 2002, vol./is. 41/4(255-67), 0378-5122:0378-5122 (2002 Apr 25)
Publication Date: April 2002
Abstract: OBJECTIVES: To assess the role of different forms of ultrasound in the evaluation of peri- and postmenopausal uterus. METHODS: B-mode ultrasound, colour and pulsed Doppler sonography, three-dimensional ultrasound and three-dimensional power Doppler sonography are non-invasive tools used repeatedly for assessing morphology and vascularity of the uterus and uterine lesions in peri- and postmenopausal patients. RESULTS: The application of transvaginal colour Doppler to the peri- and postmenopausal patients for the screening for endometrial and myometrial malignancy may be a viable option if combined with ovarian screening in the same scan. In this way the capital costs would be shared and oncological preventive medicine for postmenopausal women could be initiated. Three-dimensional and power Doppler ultrasound offers improved visualisation of uterine lesions, displays an entire volume, offers accurate
volume estimation and enables retrospective review of stored data. Interactive rotation of power Doppler rendered images provides improved visualisation of the uterine vasculature.

CONCLUSIONS: Further technological development of the ultrasound imaging techniques could result in reduction of both the potential risks and economic cost of the invasive diagnostic procedures in postmenopausal patients such as dilatation and curettage operations. Same techniques can be used for early detection of endometrial malignancy in asymptomatic postmenopausal women as well as for prediction of the depth of myometrial invasion.

Source: Medline

Preoperative evaluation of pelvic tumors by Doppler and three-dimensional sonography.

Author(s) Kurjak A, Kupesic S, Sparac V, Bekavac I

Citation: Journal of Ultrasound in Medicine, August 2001, vol./is. 20/8(829-40), 0278-4297;0278-4297 (2001 Aug)

Publication Date: August 2001

Abstract: OBJECTIVE: To study a spectrum of systems (two-dimensional transvaginal, transvaginal color Doppler, three-dimensional, three-dimensional power Doppler, and contrast-enhanced three-dimensional power Doppler sonography) for preoperative evaluation of pelvic tumors.

METHODS: Two hundred ninety-two patients were evaluated by the 5 complementary methods in preoperative sonographic assessments. We examined adnexal and endometrial morphology, thickness, and volume by two- and three-dimensional sonography and analyzed blood flow by transvaginal color, pulsed Doppler, and three-dimensional power Doppler sonography in all examined patients. In 89 patients with complex adnexal lesions of uncertain malignancy, contrast-enhanced three-dimensional power Doppler sonography was performed.

RESULTS: Morphologic assessment by three-dimensional sonography yielded additional information in 58% of cases compared with two-dimensional sonography. Furthermore, this modality was superior to two-dimensional sonography in accurate depiction and diagnosis of 2 cases of fallopian tube carcinoma. Combined morphology and vascular indexing reached sensitivity of 97% and specificity of 99%. Endometrial volume in patients with malignant disease was significantly different (28.2 +/- 0.02 cm^3) from that in those who had hyperplasia (7.81 +/- 0.03 cm^3), polyps (3.5 +/- 0.02 cm^3), or normal endometria (0.8 +/- 0.02 cm^3). With combined morphologic and three-dimensional power Doppler examination of endometrial lesions, sensitivity and specificity reached 89% and 97%, respectively.

CONCLUSIONS: Combined morphologic and vascular imaging improves preoperative assessment of gynecologic tumors.

Source: Medline

Available in fulltext from Journal of Ultrasound in Medicine at Highwire Press

Three-dimensional hysterosonography for the study of endometrial tumors: comparison with conventional transvaginal sonography, hysterosalpingography, and hysteroscopy.

Author(s) Bonilla-Musoles F, Raga F, Osborne NG, Blanes J, Coelho F

Citation: Gynecologic Oncology, May 1997, vol./is. 65/2(245-52), 0090-8258;0090-8258 (1997 May)

Publication Date: May 1997
Abstract: We studied endometrial thickness and homogeneity in 36 patients with postmenopausal bleeding using three-dimensional ultrasound following distention of the uterine cavity with a sterile saline solution (3D-SHSG). Results with 3D-SHSG were compared with findings using transvaginal sonography, transvaginal sonohysteroscopy, transvaginal color Doppler, and hysteroscopy. Sixteen patients (including three on tamoxifen) were undergoing hormone therapy at the time when they were studied. Visualization of the uterine cavity and of endometrial thickness was better with 3D-SHSG than with any of the other ultrasound techniques. The results with 3D-SHSG corresponded to the findings observed with hysteroscopy. Three-dimensional SHSG seems to improve ultrasound determination of myometrial and cervical invasion in cases of endometrial adenocarcinoma.

Source: Medline

The diagnostic value of endometrial thickness and volume measurements by three-dimensional ultrasound in patients with postmenopausal bleeding.

Author(s) Gruboeck K, Jurkovic D, Lawton F, Savvas M, Tailor A, Campbell S

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Abstract: We compared endometrial thickness and volume in patients with postmenopausal bleeding, and examined the value of each parameter in differentiating between benign and malignant endometrial pathology. A total of 103 patients with a history of postmenopausal bleeding were recruited into the study. Patients who were taking hormone replacements therapy or other hormonal preparations with a known effect on the endometrium were excluded. Each patient underwent three-dimensional ultrasonography for the measurement of endometrial thickness and volume. In 97 cases both of these measurements were obtained and the results were compared to the histological diagnosis after endometrial biopsy or dilatation and curettage. Endometrial cancer was diagnosed in 11 patients. The mean endometrial thickness was 29.5 mm (SD 12.59) and the mean volume was 39.0 ml (SD 34.16). In the remaining 86 patients there were eight cases with endometrial hyperplasia and seven with endometrial polyps. The endometrial thickness and volume in patients with benign pathology was 15.64 mm (SD 5.26) and 5.47 ml (SD 6.32), respectively. In 71 patients with atrophic or normal endometrium the mean thickness and volume was 5.29 mm (SD 3.97) and 0.91 ml (SD 1.71), respectively. Receiver operating characteristic curves showed endometrial volume to be superior to endometrial thickness for the diagnosis of endometrial cancer. The optimal cut-off value of endometrial thickness for the diagnosis of cancer was 15 mm, with the test sensitivity of 83.3% and positive predictive value of 54.5%. With the cut-off level of 13 ml for endometrial volume measurement the sensitivity was 100% and the positive predictive value 91.7%. Both the thickness and volume were higher in patients with advanced and less differentiated cancers. The measurements of endometrial volume was superior to that of endometrial thickness as a diagnostic test for the detection of endometrial cancer in symptomatic postmenopausal women.

Source: Medline

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