Sonography in Postmenopausal Bleeding

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Postmenopausal bleeding is a serious and not uncommon clinical gynecologic occurrence that mandates evaluation. In fact, classic teaching has labeled postmenopausal bleeding as “endometrial cancer until proven otherwise.” Studies indicate that the incidence of malignancy in such patients ranges from 1% to 14%, and obviously this rate will vary depending on the years since menopause and the classic risk of factors such as obesity, hypertension, diabetes, and low parity.1

Transvaginal sonography can and should be considered as a first-line approach to this clinical problem because of the extremely high negative predictive value of a thin distinct endometrial echo when adequately visualized (Table 1).2–6 The overall risk of malignancy from these large prospective trials in postmenopausal women with bleeding is 1 in 917. Clearly the thinner the “cutoff” used, the fewer the cancers that will slip through the cracks, but there will be more patients needing alternative evaluation. The American College of Obstetricians and Gynecologists has opined7 that in postmenopausal women with bleeding, when present, “a thin distinct endometrial echo on transvaginal ultrasonography 4 mm or less has a risk of malignancy of 1 in 917, and therefore endometrial biopsy is not required” (Figures 1 and 2). The most likely diagnosis in such cases is an atrophic endometrium.

There are some important clinical realities to this approach, however. Not all uteri lend themselves to a meaningful sonographic examination yielding an adequate depiction of the endometrial cavity (Figures 3 and 4). Previous surgery, coexisting leiomyomas, axial orientation, marked obesity, and adenomyosis can all result in an inability to find a reliable endometrial echo. In such cases, fluid enhancement by saline infusion sonohysterography will easily highlight the endometrial cavity. Sonohysterography should be thought of as a subset of transvaginal sonography to be used when an endometrial echo is not well visualized or is not thin and distinct.

When spontaneous endometrial fluid is present, it may be thought of as a “naturally occurring” sonohysterogram. If the endometrium surrounding the fluid is thin (<2 mm) on each side and symmetric, it is compatible with atrophy.8

Sonohysterography, when needed, is a relatively simple, inexpensive, and well-tolerated office procedure. In those cases of inadequate visualization, it will yield an excellent depiction of the endometrial thickness. In those cases of a thick endometrial echo, it will distinguish focal from global lesions (Figures 5 and 6). Why is this capability important? Blind endometrial sampling has been and, unfortunately for many clinicians, is still the first “go-to” method for endometrial evaluation in patients with postmenopausal bleeding, and when positive for cancer or even atypical complex hyperplasia,
it will allow the patient to go directly to definitive therapy. However, when negative, it is not nearly as reliable as many clinicians have been led to believe. Blind sampling began with in-hospital dilation and curettage and was then replaced by the in-office Vabra aspirator (Berkley Medical Devices, Berkley, CA) and finally the current standard: the suction piston biopsy instrument. This device was first described in 1984 by Cornier and was known as the Pipelle de Cornier. It is a plastic disposable catheter with its own internal piston to generate suction. It was designed to date the endometrium as part of an infertility workup, something no longer used in clinical practice. It was initially studied in 40 patients with known carcinoma and in that widely publicized study achieved accuracy of 97.5% (39 of 40 patients). At least 3 similar studies in patients with known carcinoma using this device were carried out.11–13 The number of cancers missed were 8%, 16%, and 33%, respectively. However, Guido et al12 opened the uteri, and of 65 patients with cancer, the 11 cases that were missed all occupied less than 50% of the surface area of the uterine cavity. In addition, of 11 cancers in polyps, Pipelle missed 5. Perhaps most importantly, in only 46% of the cancers (30 of 65) did the tumor occupy more than 50% of the uterine cavity, but in all of these, Pipelle was successful in detecting the malignancy. The important message here is that endometrial cancer is often focal and not global, so blind endometrial sampling is not nearly as reliable as many clinicians would like to believe.

In summary, in women with postmenopausal bleeding, a thin distinct endometrial echo on transvaginal sonography has an extremely high negative predictive value (>99%). Not all uteri lend themselves to a meaningful sonographic evaluation. When the echo is not adequately visualized or seen but not sufficiently thin (<4 mm), saline infusion sonohysterography is a subset of transvaginal sonography that will clarify endometrial findings and triage patients to (1) no disease, (2) focal abnormality, or (3) global abnormality. Blind suction piston biopsy, unless positive, cannot be relied on to sufficiently exclude disease. Thus, “ultrasound first” as the approach to women who present with postmenopausal bleeding is “sound judgment.”

Table 1. Endometrial Thickness and Cancer Findings in Postmenopausal Women With Bleeding

<table>
<thead>
<tr>
<th>Reference</th>
<th>Women in Study, n</th>
<th>Endometrial Thickness, mm</th>
<th>Cases of Cancer, n</th>
<th>Negative Predictive Value, %</th>
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<tbody>
<tr>
<td>Karlsson et al²</td>
<td>1168</td>
<td>≤4</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Ferrazzi et al³</td>
<td>930</td>
<td>≤4</td>
<td>2</td>
<td>99.4</td>
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<tr>
<td>Gull et al⁴</td>
<td>163</td>
<td>≤4</td>
<td>4</td>
<td>99.1</td>
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<tr>
<td>Epstein and Valentin⁵</td>
<td>97</td>
<td>≤5</td>
<td>1</td>
<td>99.4</td>
</tr>
<tr>
<td>Gull et al⁶</td>
<td>394</td>
<td>≤4</td>
<td>0</td>
<td>100</td>
</tr>
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</table>

Figure 1. Transvaginal pelvic sonogram in the long-axis projection from a postmenopausal patient who presented with bleeding. The endometrial echo is thin, measuring 1.5 mm in maximum thickness. In large prospective studies, such a sonographic picture has been associated with a risk of malignancy of 1 in 917.

Figure 2. Video clip of a patient with postmenopausal bleeding. This long-axis view of the endometrium depicts a thin distinct endometrial echo, reliably excluding malignancy.
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Figure 3. Transvaginal sonogram showing a retroverted long-axis view of the uterus. No distinct endometrial echo was visualized secondary to marked acoustic heterogeneity from adenomyosis. In such cases, unenhanced transvaginal sonography cannot be relied on to exclude disease.

Figure 4. Transvaginal sonogram showing a retroverted long-axis view of the uterus. An endometrial echo is thin and distinct and easily seen emanating from the endometrial canal. This image is a reliable depiction of a useful endometrial echo compatible with atrophy.

Figure 5. A. Sonogram from a patient who presented with postmenopausal bleeding. The endometrial echo is clearly thickened. B. Sonohysterogram from the same patient. Not only is the endometrium itself thickened, but there is a focal abnormality on the anterior wall halfway to the fundus measuring 1.1 cm in maximum anteroposterior diameter. It represented an endometrial polyp on a backdrop of complex endometrial hyperplasia.

Figure 6. Saline infusion sonohysterogram from a patient with postmenopausal bleeding whose unenhanced image was not thin and distinct. This image depicts a global endometrial process. Blind endometrial biopsy revealed simple hyperplasia.
References