Dra. Deborah Levine  
Boston, MA, USA

Postmenopausal pelvis

Objectives:

• Review the normal appearance of the postmenopausal ovary including a discussion of postmenopausal adnexal cysts
• Present an algorithm for evaluation of postmenopausal bleeding, including discussion of hormone effects on the endometrium
• Demonstrate the use of sonohysterography in women with abnormal bleeding

The postmenopausal ovary

A rapid decline in ovarian volume in the first five to ten years after menopause is followed by a more gradual decrease in size. This variation in size leads to difficulty in establishing a normal size for the postmenopausal ovary. Reports vary from 1.2-5.8 cm³. These values are likely high, since ovaries that were not visualized by ultrasound were excluded in the average size determination. Given the variation in normal measurements, a general guideline for ovarian size is that the ovarian volume should be less than 8 cm³, and should not be greater than twice the volume of the opposite side. Due to their small size and lack of follicles, postmenopausal ovaries are often difficult to visualize. Visualization of postmenopausal ovaries using transvaginal sonography varies from 20-99%.

Eighty percent of ovarian malignancies occur in postmenopausal women. The risk increases with ovulatory age. Sonography is important in the assessment of postmenopausal ovaries in that it 1) can determine if a mass is adnexal in etiology; and 2) can characterize the mass as being completely cystic (and therefore likely benign), complex, or completely solid.

Ultrasound, especially transvaginal ultrasound, has been advocated as a method for screening for ovarian cancer. The main problem with ultrasound as a screening tool is that the majority of causes of ovarian enlargement are benign. Postmenopausal women have the additional problem of having benign adnexal cysts. Since cysts are common in postmenopausal women, they are no longer automatically surgically removed. A suggested approach to management of postmenopausal adnexal cysts is given in figure 1.

Endometrial cancer and the postmenopausal endometrium

Endometrial carcinoma is the most common gynecologic malignancy, with 33,000 new cases reported per year, and 75-85% of cases occurring after the age of 50. Sonography is important in evaluating for this disease since the endometrium can be accurately measured and well visualized. The transvaginal examination is especially
important in women with postmenopausal bleeding since it allows for accurate measurement of the endometrium and improved visualization of endometrial (as well as adnexal) pathology. The transvaginal probe is well accepted by most women postmenopause. The normal postmenopausal endometrium is atrophic. It is usually a thin echogenic line. In asymptomatic women a threshold of 8 mm in thickness has been suggested. This threshold is decreased to 4 mm in women who are bleeding. Estrogenic hormones will also cause increased endometrial thickness (and an increased incidence of endometrial hyperplasia, polyps, and cancer). Therefore the patient's symptoms (bleeding or not bleeding) as well as hormone use are important in the evaluation of the postmenopausal endometrium.

In addition to the endometrial thickness, the morphologic appearance of the endometrium is important to note. A homogeneous endometrium with a sonographically depictable central echo between symmetric endometrial layers is associated with a benign endometrium histologically, whereas heterogeneity is associated with pathology (polyps, hyperplasia, and cancer).

Sonography frequently identifies focal endometrial lesions that are missed by endometrial biopsy. These focal lesions usually are secondary to endometrial polyps and focal hyperplasia, but may be due to endometrial cancer. When a postmenopausal patient presents with a thickened endometrium or a focal endometrial lesion and the histologic diagnosis is "scant tissue" or atrophic endometrium, it is likely that a focal lesion was missed during biopsy. In these cases, sonohysterography will identify the lesion for biopsy localization, or the biopsy can be performed under hysteroscopic guidance.

Hormone use
Estrogenic hormones are prescribed in the peri- and postmenopausal period in order to protect against fractures caused by osteoporosis and to alleviate menopausal symptoms. In women who still have a uterus, progesterone is added in order to decrease the risk of endometrial cancer caused by the use of unopposed estrogen. Progesterone can either be given in a continuous daily fashion, such that both estrogen and progesterone are given every day, or in a sequential fashion, such that estrogen is given the first 25 days in a month and progesterone is given for 10-15 days with withdrawal bleeding occurring at the end of the cycle. A study entitled "Risks and Benefits of Estrogen Plus Progestin in Healthy PM Women (JAMA 7/17/02)" showed that the risks of heart disease, stroke, breast cancer, and pulmonary embolism outweighed the benefit of decreased fracture and colorectal cancer. Nonetheless, in a study on HMO drug use in December 2002, 15% of women age 53-58 were still taking hormones. Therefore, it is still important to understand the effect of hormones on the postmenopausal endometrium.

In postmenopausal women who do not take exogenous estrogens, the endometrium is typically thin (less than 4 mm) and atrophic. After a woman has been taking continuous daily estrogen and progesterone for three to four months, the endometrium also should appear thin and atrophic. In contrast to this, 55% of women who use unopposed estrogen will have a thickened, slightly heterogeneous endometrium. This thickening should be regarded with concern because of estrogen’s trophic effect on the
endometrium, which increases the risk for endometrial hyperplasia, polyps and cancer. These women should undergo endometrial biopsy or dilation and curettage.

**Sequential Hormones**
Over half of postmenopausal women who use sequential hormones have a thick (> 8 mm) endometrium at some point of their cycle. These women frequently have changing endometrial thickness with the majority of these patients having a decrease in endometrial thickness when evaluated at the end or the beginning of the next cycle. Therefore, when a thick endometrium is visualized in a woman who is taking sequential hormones, this finding should be correlated with her phase of the cycle, and she should be rescanned, if necessary, at the beginning or end of the hormonal cycle. If the endometrium remains thickened, the patient should undergo a biopsy or dilation and curettage.

A suggested protocol for management of postmenopausal endometrium is given in figure 2.

**Tamoxifen and Megase**
Additional hormones to consider are tamoxifen and Megase. These drugs are used as adjunctive therapy in women who have breast cancer. Tamoxifen is also used for prophylaxis in women with a hereditary risk of breast cancer. Tamoxifen and Megase cause a thickened, cystic-appearing endometrium. Some of these changes are due to reactivation of small foci of adenomyosis. However, since tamoxifen acts as an estrogen agonist in the uterus, endometrial thickening can be due to polyps, hyperplasia, or cancer. Sonohysterography aids in the differentiation between endometrial and inner myometrial pathology, since a thin normal endometrium lining can be seen in women who have reactivation of foci of adenomyosis as the cause of cystic-appearing endometrium while endometrial lesions will be outlined by the instilled fluid.

**REFERENCES**

Postmenopausal Endometrium Recommendations

- **≤4 mm**
  - bleeding
  - no biopsy (probably atrophy)

- **5-8 mm**
  - bleeding
  - biopsy
  - no biopsy

- **>8 mm**
  - no bleeding
  - sequential hormones
  - rescan in progesterone phase

Endometrial Thickness (Double Layer) assumes a homogeneous endometrium.
Management of Postmenopausal Cysts

Atypical features:
- Any solid elements
- Septations
- Low resistive index (< 0.4)

Postmenopausal cyst

Ultrasound

Anechoic
- Enhanced through transmission
- No solid elements
- High resistive index (> 0.7)

Benign appearing:

Surgery

< 3 cm
- Ultrasound follow-up in 3 months

- Increased size
  - Surgery
  - Follow-up or removal

3 - 6 cm
- If stable or ↓ size
  - Normal
  - CA 125

6 cm
- Surgery
  - (Likely neoplastic, ↑ likely benign)
  - CA 125

↑ size
- Surgery

Stable or ↓ size
- Ultrasound follow-up in 6 months