

RATIONAL IMAGING

Imaging the endometrium in postmenopausal bleeding

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The patient

A 72 year old multiparous woman presented with intermittent postmenopausal bleeding. The patient's relevant medical history included insulin dependent diabetes, hypertension, and recent breast cancer. She had been treated with tamoxifen for three years. On examination, the patient was obese (body mass index 32) and no cause for the bleeding was found in the introitus, vulva, vagina, cervix, uterus, or adnexa. She was referred to the cancer unit for gynaecological assessment in accordance with "improving outcomes in gynaecological cancers" 1999 guidelines.¹

What imaging tests do I request?

The patient has several risk factors for endometrial hyperplasia and endometrial carcinoma including the use of tamoxifen, obesity, diabetes, and hypertension. Although the routine screening of patients is not recommended, postmenopausal bleeding is an indication for detailed evaluation of the endometrium.²

Transabdominal ultrasound of the pelvis

Transabdominal pelvic ultrasound is not appropriate in this patient. Adequate evaluation of the uterus—particularly the endometrium—cannot be performed transabdominally.

Transvaginal ultrasound of the pelvis

Transvaginal ultrasound of the pelvis is a highly reliable method for detecting endometrial cancer. In patients with postmenopausal bleeding, if the thickness of the endometrium is uniformly 5 mm or less, the probability of endometrial cancer is less than 1%.² Sampling of the endometrium must be performed if there is diffuse thickening of the whole endometrium or focal thickening of part of the endometrium measuring 5 mm or more.¹ The combination of abnormal vaginal bleeding and an endometrial thickness 5 mm or greater is 92% sensitive and 57% specific for endometrial cancer.³

Transvaginal ultrasound may indicate the type of abnormality seen within the endometrium—for example, endometrial hyperplasia, polyps, or carcinoma. Classically, endometrial hyperplasia affects the entire endometrium and results in widening of the endometrium. The endometrial hyperplasia has a cystic lace-like appearance on ultrasound. Endome-

LEARNING POINTS

- Risk factors for endometrial cancer are prolonged (more than five years) use of unopposed oestrogen hormone replacement therapy, tamoxifen use, hereditary non-polyposis colorectal carcinoma, obesity combined with diabetes, hypertension, and endogenous or exogenous increase in oestrogens
- Transvaginal ultrasound should be the primary imaging investigation for assessing the endometrium in postmenopausal women with vaginal bleeding
- Endometrial thickness of 5 mm or more requires endometrial biopsy; thickness less than 5 mm has a negative predictive value for endometrial cancer of 98%
- Magnetic resonance imaging is reserved for staging endometrial cancer before surgery

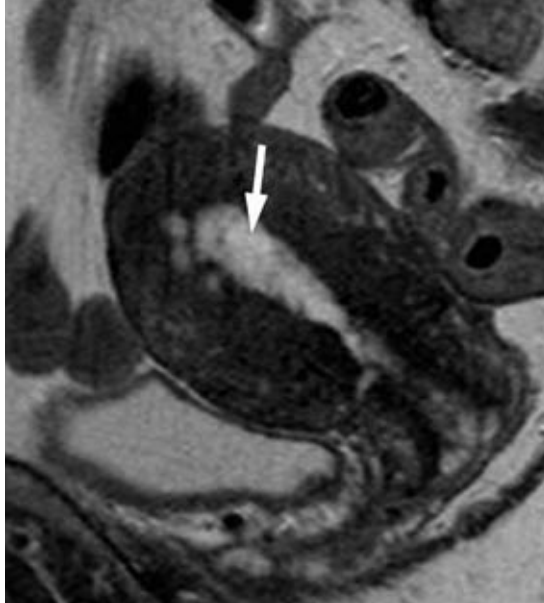
trial polyps manifest as focal areas of endometrial thickening, and the stalk of the polyp may be seen if sufficient fluid is present in the endometrial cavity. Endometrial carcinoma may occur in the form of a polyp, within endometrial hyperplasia, or as a heterogeneous endometrial mass with a widened irregular cavity. Pathological confirmation of the histology is needed in all cases, as the ultrasound appearances overlap considerably. Endometrial biopsy is performed if the endometrial cavity is irregular, the endometrium has diffuse or focal widening greater than 5 mm, or if the whole endometrium has not been adequately assessed.^{4,5}

Transvaginal ultrasound may also identify ovarian pathology, including polycystic ovaries in younger women and ovarian tumours secreting oestrogens, causing abnormal vaginal bleeding. The ovaries are atrophic in most postmenopausal women and cannot be identified on ultrasound in up to 20% of women.

Pelvic magnetic resonance imaging

The appearances of endometrial cancer, hyperplasia, and benign polyps also overlap on magnetic resonance imaging and its role is in the staging of biopsy confirmed endometrial cancer. Magnetic resonance imaging is more sensitive than transvaginal ultrasound or computed tomography in the detection of deep myometrial invasion and tumour spread beyond the uterus. The natural contrast between the endometrial tumour and surrounding myometrium is poor on transvaginal

This series provides an update on the best use of different imaging methods for common or important clinical presentations. The series editors are Fergus Gleeson, consultant radiologist, Churchill Hospital, Oxford, and Kamini Patel, consultant radiologist, Homerton University Hospital, London



Sagittal T2 weighted image showing the mass within the endometrial cavity (arrow). No underlying myometrial invasion is present, indicating a stage 1a carcinoma of the endometrium with a background of endometrial hyperplasia

ultrasound. Consequently, magnetic resonance imaging is more sensitive than ultrasound (84-87% (specificity 91-94%) *v* 77%).⁵⁻⁷ Endometrial cancer is staged surgicopathologically according to FIGO (International Federation of Gynecology and Obstetrics) criteria. Preoperative magnetic resonance imaging is performed to identify patients with deep myometrial invasion, enlarged pelvic nodes, and extrauterine extension of disease, which alter the extent of surgery.

Outcome

Transvaginal ultrasound showed a normal sized uterus. The endometrium was 12 mm thick with a lace-like pattern; this was compatible with endometrial hyperplasia, probably secondary to treatment

with tamoxifen. Because neither ovary was identified, they were assumed to be atrophic as a result of age. No other adnexal masses or ascites were identified.

After the ultrasound, the patient had a hysteroscopy and a pipelle biopsy of the endometrium. The pathological specimen confirmed a background of complex endometrial hyperplasia, but two small foci of grade 2 endometrial carcinoma were found within the endometrium.

Magnetic resonance imaging of the pelvis showed a FIGO stage 1a carcinoma (figure), and the patient had a total abdominal hysterectomy, bilateral salpingo-oophorectomy, and pelvic lymphadenectomy.

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Positive "tea sign"

It was Christmas Day, and an 81 year old patient had been brought in from a nursing home. His casualty card read: "?decreased conscious level, increased rigidity." The carer wasn't present. A brief assessment established that his score on the Glasgow coma scale was 7 out of 15 (a prolonged sternal rub had elicited flexion of the arm at the elbow joint with flickering of the eyelids and a groaning sound). On auscultation, vesical breath sounds were barely audible bilaterally.

I summoned the registrar, making plans to transfer the patient to the resuscitation bay and possibly call the anaesthetist. The registrar's question of "Would you like a cup of tea?" elicited symmetrical movement of the face (a smile), opening of the eyes, and coherent language ("Oh, yes please").

With a simple question, my registrar had provided sufficient cerebral stimulation for the Glasgow coma scale to leap to 14. The carer returned, the patient's history was obtained, and the patient was examined and subsequently returned to his nursing home to rejoin the Christmas festivities.

Consequently, the positive "tea sign" has become engraved on my mind as an informal test of consciousness. I look forward to testing its validity in the future.

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