The role of ultrasound in the diagnosis and management of women with Abnormal Uterine Bleeding

Overview

- Description of endometrial morphology: IETA terminology
- Ultrasound based management of postmenopausal bleeding (PMB)
- Ultrasound investigation of abnormal bleeding in fertile women
- How manage incidentally detected thick endometrium in post-MP women?

IETA- TERMINOLOGY:
ENDOMETRIAL GRAYSCALE MORPHOLOGY

- UNIFORM
- NON-UNIFORM
- REGULAR
- IRREGULAR
- INTERRUPTED

Assessment of endometrial morphology – when can it be useful?

- Postmenopausal bleeding
  - Morphological features suggestive of cancer
  - Feeding vessels – predictive of focal lesions
- Adenomyosis
  - Look at endometrial myometrial interface – “endometrial buds”
- Endometrial cancer
  - Differentiate between high and low risk cancer
Ultrasound based management of post-menopausal bleeding

Normal PM endometrium Stage IV endometrial cancer

Postmenopausal bleeding

- 10-15% will have endometrial cancer
- Endometrial thickness measurement is the most simple and accurate method to estimate the risk of malignancy using a 5mm cut-off
- Endometrium < 5mm: Low risk of endometrial cancer both at the time of bleeding and during long time follow-up
- Endometrium ≥ 5mm: High risk of cancer both at the time of bleeding and during long time follow-up
- 5 mm cut-off can be used both in women with and without HRT (false positive rate higher in HRT users)

Investigation of PMB

Aim:
- To rule out cervical cancer
- To estimate the risk of endometrial cancer
- To determine the optimal biopsy procedure
- In women with cancer – to assess the extension of the tumor

Primary step

- Gynaecological examination including pap-smear or cervical biopsy - if suspected tumour
- Transvaginal ultrasound
  - Endometrial thickness
  - Ovarian pathology – hormone secreting tumour?

Secondary step: To determine the optimal biopsy procedure

- Blind curettage/sampling
  - Fail to diagnose 50% of benign and 10% of malignant lesions*
  - Not the optimal procedure unless focal lesions can be ruled out
- Hydrosonography
  - Easy, quick, cost-effective method to rule out focal lesions
  - Women prefer hydrosonography over hysteroscopy**

**Timmerman 1998, de Kroon 2008
What is a focal lesion?

Any solid structure that protrudes into the endometrial cavity. It can be polyp, focal – hyperplasia, cancer, fibroid etc.

"Feeding vessel" are predictive of focally growing lesions (Timmerman 2003 UOG)

Hydrosonography vs. Doppler**
• Detection rate and positive predictive value: equally good
• False positive rate higher and negative predictive value lower for ‘feeding vessel test’

Hydrosonography first line test to rule out focal lesions

Diagnostic accuracy focal lesions: Hydrosonography vs. Doppler**

Hydrosonography

PMB, endometrium > 5 mm or unmeasurable
To determine the optimal biopsy procedure

Simple endometrial biopsy
Failed biopsy/ insufficient sample: D&C or hysteroscopy

Operative Hysteroscopy
Feeding vessel?

Diagnostic hysteroscopy

If strong suspicion of cancer take a simple biopsy - if positive go directly to hysterectomy
If negative proceed to hysteroscopy.

Abnormal bleeding in fertile women

Ethiology abnormal bleeding - fertile women

Menorrhagia
• Idiopathic (dysfunctional uterine bleeding)
• Functional
  – PID, pregnancy related, IUD, won Willebrands disease, hypothyroidism, etc.
• Structural
  – Fibroids, polyps, hyperplasia, adenomyosis, endometrial/cervical cancer

Irregular bleeding

Functional
• Exogenous hormones, pregnancy related, PID
• Ovulation disturbance:
  • PCO, thyroid disease, eating disorders, stress, chronic illness, excess exercise etc.

Structural
• Fibroids, polyps, endometrial hyperplasia, adenomyosis, cervical cancer, endometrial cancer, cesarean scar defect

Structural cause of abnormal bleeding fertile women

Fibroid
adenomyosis
hyperplasia

Endometrial polyp
Endometrial cancer
Cervical cancer

E Epstein, 2017
Ultrasound findings more difficult to interpret in pre-MP women

- Polyps are more common in asymptomatic (8%) than in symptomatic women (4%) Dreisler 2009
- We don’t know the exact prevalence of myomas and adenomyosis in asymptomatic women
- Finding a structural abnormality does not necessarily indicate that it causes the bleeding disturbance:
  - Polyps may regress spontaneously, resection has questionable effect on bleeding
  - Submucous myomas: resection will not always improve symptoms

Abnormal uterine bleeding in fertile women: Ultrasound examination – key points

- Reliable assess of endometrium: Early follicular phase or after withdrawal bleeding
  - If thickened (≥ 5mm) or abnormal, infuse saline
- Signs of "Functional" i.e., anovulatory bleeding?
  - Thick endometrium, but no corpus luteum (PCO? Functional cyst??)
- Rule out structural lesions
  - Focal/ global lesion of cervix, endometrium or myometrium
  - Look at ovaries to exclude hormone producing ovarian tumors (Granulosacell tumor, Sertoli, Leydigcell tumor, Dysgerminoma etc…)

Investigation of persistent abnormal bleeding in fertile women – when to perform endometrial biopsy?

Consider endometrial biopsy/ operative hysteroscopy if you find pathologically thickened endometrium or focal pathology in follicular phase/after withdrawal bleeding

(ACOG Practice Bulletin 2004)

- All women ≤ 35 with risk factors * (PCOS, HNPPC, BRCA1/2)
- Women > 35 years
  - With intermenstrual bleeding
  - Menorrhagia not responding to medical therapy

Take home message

- Ultrasound based management of PMB is cost effective
  - PMB endometrium < 5 mm – no need for endometrial biopsy. Important to rule out cervical cancer. If re-bleeding repeat pap-smear/cervical biopsy, sample endometrium
  - PMB endometrium ≥ 5 mm – endometrial biopsy and hysterosonography mandatory to rule out endometrial cancer
  - Focal lesions should be removed by operative hysteroscopy
- Abnormal bleeding in fertile women
  - US findings does not always correlate to symptoms
  - Always assess in early follicular phase or after withdrawal bleeding
    - If suspected pathology: consider biopsy in women <35 years with risk factors (family history, obesity, PCOS) and in all women > 35 years.

Should we screen for endometrial cancer in asymptomatic postmenopausal women?

- Meta-analysis, review Breijer 2012: Asymptomatic, PM-women, no HRT, histological verification (n=11.100)
- Mean endometrial thickness 2.9 mm (95% CI 2.6-3.3mm)
- Prevalence endometrial cancer 0.6%, atypical hyperplasia 0.6%
- Positive predictive value: 0.0-0.2 for any cut-off = USELESS (> 10 good test)
- Negative predictive value: 0.98-1.0 for any cut-off = USELESS (< 0.1 good test)
- UKCTOCS, 2011 (n=48230)
  - Best cut-off 5mm, 25% of population “high risk” (40% of malignancies found in this group), PPV only 1.4%, NPV 99.9% (sens 77% spec 86%)

How manage asymptomatic postmenopausal women with thickened endometrium?

Screening probably not valuable in a low-risk population
Should we screen for endometrial cancer in asymptomatic postmenopausal women?

• Geber B, 2001:
  – US detection of asymptomatic endometrial cancer in PM women offers no prognostic advantage over symptomatic disease discovered by uterine bleeding.
  – Screening does not improve survival but confers higher costs and higher morbidity

Conclusion – asymptomatic thickened endometrium in PM women

• Screening not meaningful
• Still consider biopsy if:
  – Clearly suspicious morphology – irregular endometrium/irregular border, multiple vessels, hematomena
  – High risk patient: HNPCC, obese, unopposed estrogens?