ISUOG Basic Training
Examining the Uterus: Cervix & Endometrium
Learning objectives

At the end of the lecture you will be able to:

• Recognise the typical ultrasound appearances of a normal cervix and endometrium

• Recognise the typical ultrasound appearances of abnormalities in the cervix and endometrium
Key points

• Understand the typical ultrasound features of a normal cervix and endometrium

• Understand the typical ultrasound features of common abnormalities in the cervix and endometrium

• Know when to refer for a specialist opinion
Rectovaginal nodule of endometriosis

- You don’t need to know how to recognise this
- It is just a reminder to not forget to look at the vagina when you start your TV US
- The more you see ‘normal’ the easier it will be to recognize abnormalities

Cervix
Cervical findings

- Nabothian follicle
- Cervical polyp
- Cancer
Nabothian follicle

• Mucus-filled cyst on surface of cervix
  - Caused by squamous epithelium of the ectocervix growing over the columnar epithelium of the endocervix
  - This tissue growth can block the cervical glands

• On ultrasound:
  - Anechoic
  - Avascular
Cervical polyps

- Sessile or pedunculated well-circumscribed masses within endocervical canal
- Hypo or hyper-echogenic
- Identifying the stalk attaching to the cervical wall helps differentiate it from an endometrial polyp
- May have feeding vessel
Cervical cancer

- Heterogeneous mass involving the cervix
- May show increased vascularity on color Doppler
- Ultrasound can be useful to evaluate:
  - Size (<4 cm or ≥4 cm)
  - Parametrial invasion
  - Tumor invasion into the vagina
  - Tumor invasion into adjacent organs
  - Hydronephrosis (implies stage IIIB tumour)
Endometrium
Normal ultrasound findings

- Differ between women before and after menopause
- Change throughout the menstrual cycle
The endometrium changes throughout the menstrual cycle.

- Shortly after menstruation
- Proliferative phase
- Proliferative phase
- Secretory phase
Changes during menstrual cycle

- Shortly after menstruation
- Proliferative phase 3 days before ovulation
- Proliferative phase 1 day before ovulation
- Secretory phase 6 days after ovulation
How to measure endometrial thickness (ET)
How to measure endometrial thickness (ET)

1. When intracavitary fluid is present, measure thickness of both single layers and *add* together to give ET

2. When intracavitary pathology is present measure total ET *including* the lesion (unless it’s a well defined myoma that can be measured separately)

Leone et al. UOG, 2010, 35: 103–112
Average endometrium measurements throughout the menstrual cycle

<table>
<thead>
<tr>
<th>Phase</th>
<th>Measurements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Menstrual phase</td>
<td>2-4 mm</td>
</tr>
<tr>
<td>Proliferative</td>
<td>4-8 mm</td>
</tr>
<tr>
<td>Proliferative</td>
<td>4-8 mm</td>
</tr>
<tr>
<td>Secretory phase</td>
<td>7-14 mm</td>
</tr>
</tbody>
</table>
The endometrium in postmenopausal women

- Median ET = 3mm
- 10th & 90th percentile: 2 – 5mm
- ET >5mm is NOT necessarily pathological
Describing the endometrium

- **Hypo**echogenic
- **Iso**echogenic
- **Hyper**echogenic

Leone et al. UG, 2010, 35: 103–112
Endometrial-myometrial junction

Regular

Irregular

Interrupted

Leone et al. UOG, 2010, 35: 103–112
The IETA consensus statement

How to describe
• Endometrial echogenicity
• Endometrial midline
• Endometrial-myometrial junction

If fluid in the cavity
• Fluid echogenicity
• Endometrial outline
• Intracavitary lesion

On colour/power Doppler
• Colour content
• Morphology of endometrial vessels

Anything that protrudes into a fluid-filled uterine cavity

Leone et al. UOG, 2010; 35: 103–112
Describing intra-cavity lesions

- Measurement
- Endometrial lesion or arising from myometrium (e.g. fibroids)?
- Subjective assessment: extent of endometrial lesion = % of total endometrial surface involved
  a. ‘Localised’ if <25%
  b. ‘Extended’ if endometrial abnormality involves >25%
- Echogenicity: uniform or non-uniform
- Outline: irregular or irregular
- Colour Doppler

Leone et al. Ultrasound Obstet Gynecol 2010, 35: 103–112
Degree of protrusion into cavity

Proportion of a myoma protruding into the uterine cavity at sonohysterography or when there is pre-existing fluid in the uterine cavity:

a. 100%, Grade 0
b. ≥ 50%, Grade 1
c. < 50%, Grade 2

How to measure intra-cavity lesions

Measured in three perpendicular diameters in mm

Leone et al. UOG, 2010, 35: 103–112
Most common endometrial pathology

- Polyp
- Submucous myoma
- Endometrial thickening
- Cancer
Typical ultrasound features of endometrial polyp

- Bright edge
- Regular cysts
- Hyperechogenic
- Feeding vessel
Typical ultrasound features of submucous myoma

- Solid tumor protruding into uterine cavity
- Same echogenicity as myometrium

- Colour Doppler: ring of colour
Intra-cavity fluid

Measured in three perpendicular diameters in mm

The amount of intracavitary fluid is defined by its largest measurement in the sagittal plane.

Intracavitary fluid is described as:

a. ‘anechoic’ or ‘low-level’ echogenicity
b. ‘ground glass’
c. ‘mixed’ echogenicity

Leone et al. UOG, 2010, 35: 103–112
Typical ultrasound features of endometrial cancer

- Thick endometrium
- Inhomogenous echogenicity
- Richly vascularised on colour Doppler
How to apply colour and power Doppler

• Ensure color and power Doppler box includes endometrium with the surrounding myometrium
• Magnification and settings adjusted to ensure maximal sensitivity for blood flow
  - Ultrasound frequency at least 5.0 mhz
  - Pulse repetition frequency (PRF) 0.3 – 0.6 khz
  - Wall filter 30–50 hz
  - Colour power Doppler gain should be reduced until all colour artefacts disappear)
• Colour score is a subjective semi-quantitative assessment of the amount of blood flow present

Leone et al. UOG, 2010, 35: 103–112
IETA consensus statement

Doppler ultrasound examination of the endometrium

Quantification of the colour content of the endometrial scan

Colour score 1
= no colour

Colour score 2
= minimal colour

Colour score 3
= moderate colour

Colour score 4
= abundant colour

Adjust settings: maximize detection of flow without artefacts
(pulse repetition frequency (PRF): 0.3-0.6 KHz, 3-6 cm/s velocity scale)

Leone et al. UOG, 2010, 35: 103–112
Benefits of fluid instillation

Leone et al. UOG, 2010, 35: 103–112
Intrauterine adhesions

Leone et al. UOG, 2010, 35: 103–112
Correct position of copper IUCD
Correct position of hormonal IUD
IUD and 3D ultrasound

Correct placement
Incorrect position of IUCD

Too low
Key points

We should use a standardized terminology when we describe ultrasound images of:

• Adnexal lesions (IOTA)
• The endometrium/uterine cavity (IETA)
• The myometrium (MUSA)
• Deep infiltrating endometriosis (IDEA)
Which patients should I refer for specialist opinion?

• Those in whom you are uncertain about the diagnosis (especially if you suspect malignancy)
Key points

When in doubt: refer for second opinion
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