The uterus and the endometrium
Common and unusual pathologies

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HEY WACH
Lecture outline

Normal
• Definitions
  – Flexion
  – Version
• Normal appearances
  – Uterus
  – Cervix
• Dimensions

Pathologies
• Uterine
  – Adenomyosis
  – Fibroids
• Endometrial
  – Polyps
  – Hyperplasia
  – Cancer

• Unusual Pathologies
  – Asherman’s
  – Osseous metaplasia
  – Post ablation syndrome

• Not covering congenital uterine malformations
To be avoided at all costs

• Do not describe every uterus with two endometrial cavities as a bicornuate uterus

• Do not use “malignancy cannot be excluded” as a blanket term to describe a mass that you cannot categorize

• Do not use “ectopic cannot be excluded” just because you cannot determine the site of the pregnancy
2 Endometrial cavities
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• Not covering congenital uterine malformations
Definitions

2 terms are described to the orientation of the uterus in the pelvis

Flexion

Version

Flexion is the bending of the uterus on itself and the angle that the uterus makes in the mid sagittal plane with the cervix i.e. the angle between the isthmus: cervix/lower segment and the fundus

Anteflexed < 180 degrees

Retroflexed > 180 degrees
Definitions

2 terms are described to the orientation of the uterus in the pelvis

Version

When there is NO angle between the uterus and the cervix the uterus is described in terms of version, which describes the displacement of the entire uterus either backwards or forwards

Anteverted

The fundus is close to the bladder

Retroverted

The fundus is close to the recto sigmoid

Retroflexed
Normal sonographic appearances

The uterus is a homogenous layer of smooth muscle and blood vessels and it is less echogenic than the adjacent endometrium.

It is composed of three layers:

- **Inner/junctional** thin and hypo echoic
- **Middle** thick and homogenous
- **Outer** thin and hypo echoic

“arcuate vessels”
Normal sonographic appearances

The cervix has 3 layers also

- Ectocervix
- Endocervix
- Endocervical canal

The cervical stroma is the same echogenicity as the myometrium
Cervical Lesions

Cervical polyp
Cervical lesions
Cervical cancer
Size does matter

Uterine size

Actual dimensions versus a subjective appreciation?

Who knows?

Who remembers?

Importance is to say why it is enlarged

• Fibroids
• Adenomyosis
• Haematometra

Dimensions that do matter

Maximum true AP in the sagittal plane to include fibroid pathology

Maximum true TS to include fibroid pathology
Normal sonographic appearances

The ever-changing endometrium

Sonographically

Immediate post menstrual phase

The endometrium is a thin echogenic line measuring between 3 and 8 mm

As the level of oestrogen rises due to secretion by ovarian follicles the endometrium proliferates and thickens into the so called trilaminar layer

This appearance is at its most prominent in the peri ovulatory phase of the cycle when it will measure 8 to 12mm in thickness

During the late proliferative period under the influence of progesterone secreted by the corpus luteum the endometrium loses its tri laminar appearance and becomes uniformly echogenic

This is the best endometrium in which to see polyps
Normal sonographic appearances

The ever-changing endometrium

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The best endometrium for 3D assessment of uterine anomalies
The best endometrium for assessment of uterine anomalies
Common pathologies
Adenomyosis

Adenomyosis

Defined as the presence of ectopic endometrial glands within the myometrium and the presence of these glands induces a hypertrophic and hyperplastic reaction in the myometrial tissue

NOT ALWAYS SYMPTOMATIC (VERY VERY IMPRT WHEN IT COMES TO REPORT)

If symptomatic

• Dysmenorrhea
• Dyspareunia
• Chronic pelvic pain
• Menometrorrhgia

Usually a diffuse disease but a focal variant can occasionally be seen
Common pathologies
Adenomyosis

Adenomyosis

Sonographic features

- Globular enlargement of the uterus
- Asymmetric anterior and posterior uterine wall thickening
- Anechoic spaces in the myometrium
- Heterogenous myometrial echo texture
- Sub endometrial linear striations (venetian blind appearances)
- Obscuration of the endometrial myometrial border DIFFICULTY MEASURING THE ENDOMETRIUM
- Thickening of the transition zone MRI

MRI
Common pathologies

Fibroids

Commonest benign tumour
30% of women > 35 years
40% of women over the age of 40 years

They are composed of smooth muscle with various amounts of connective tissue and their growth is oestrogen dependent

Leiomyomas have pseudo capsules, which are formed of compressed surrounding myometrium

Leiomyosarcomatous change is rare < 0.2%

Only 50% of leiomyomas actually grow in pregnancy
<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Intra mural</td>
<td>No bulging into the endometrium or the serosa</td>
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<td>Sub mucosal</td>
<td>A significant portion is bulging into the endometrial cavity &gt; &lt; 50 % is important</td>
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<tr>
<td>Intracavitary</td>
<td>The leiomyoma is within the endometrial cavity and it is attached to the myometrium by a pedicle</td>
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Common pathologies

Fibroids

Location is key to symptoms and management

INTRA MURAL

Intra mural: no bulging into the endometrium or the serosa
Fibroids

Location is key to symptoms and management

SUB SEROSAL

Sub serosal: a significant portion of the leiomyoma is bulging into the serosal surface
Fibroids

Location is key to symptoms and management

PEDUNCULATED

Pedunculated: the leiomyoma is exophytic and attached to the uterus by a pedicle

BEWARE THE “SOLID OVARIAN TUMOUR” OCCAMS RAZOR
Occam’s razor
When you hear the sound of hooves

Think horses  Not zebras

Simple arithmetic says that a solid adnexal mass is far more likely to be an abnormal location of a common pathology i.e. a fibroid than a rare pathology i.e. a solid ovarian tumour
FIND THE OVARY!!!!!!
Fibroids

Location is key to symptoms and management

SUB MUCOSAL

Sub mucosal: a significant portion is bulging into the endometrial cavity > < 50 % is important
Fibroids

Location is key to symptoms and management
INTRA CAVITARY

Intracavitary: the leiomyoma is within the endometrial cavity and it is attached to the myometrium by a pedicle
It may even prolapse into the cervix!!!
Common pathologies
Fibroids

Sonographic features

Solid echogenic mass

Well-defined contour, the pseudo capsule

Significant attenuation of the ultrasound beam

Unusual variants

1) Lipomatous PM !!
2) Cystic change
Common pathologies
Fibroids

Cystic change is NOT always a feature of malignancy and it is due to hyaline degeneration

Fibroid calcification

Usually central

Peripheral post embolisation
Abnormal uterine bleeding

AUB abnormal menstrual flow in women of reproductive age

Classification

• Polyps
• Adenomyosis
• Leiomyomas
• Malignancy
• Coagulopathy
• Ovarian dysfunction
• Endometrial iatrogenic
• Not yet classified
Common pathologies
Endometrial

Polyps

30% of cases of post menopausal bleeding

Echogenic
Completely contained in the endometrial cavity with NO extension into the myometrium

Homogenous usually but occasional cystic changes within

Narrow base of attachment, which may have a vascular pedicle within
Common pathologies

Endometrial

Polyps versus Intra cavity fibroids

Fibroids

Less echogenic than the endometrium with attenuation of the US beam
Broad based
Lift the surrounding endometrium
Portion extends into the myometrium
Endometrial hyperplasia

Endometrial hyperplasia is an abnormal proliferation of endometrial stroma and glands and represents a spectrum of endometrial changes.

A definitive diagnosis can be made only with biopsy, imaging cannot reliably allow differentiation between hyperplasia and carcinoma.

Up to one-third of endometrial carcinoma is believed to be preceded by hyperplasia.

All types of endometrial hyperplasia can cause diffusely smooth endometrial thickening.

Far less commonly, hyperplasia produces focal hypo echoic endometrial thickening.
Common pathologies
Endometrial

Endometrial hyperplasia and cancer

Endometrial cancer most common gynaecological cancer

Endometrial hyperplasia can be diffuse or focal and differentiating this from a polyp can at times be difficult

Endometrial cancer has similar sonographic characteristics to hyperplasia or an enlarged polyp with of course the exception of myometrial invasion
Endometrial carcinoma

Endometrial adenocarcinoma is the most common invasive gynaecologic malignancy, but thanks to early detection and treatment, it is not a leading cause of cancer deaths.

US signs of endometrial carcinoma include heterogeneity and irregular endometrial thickening.

These signs are nonspecific and can be seen in endometrial hyperplasia as well as polyps, leading to biopsy of almost any irregularity in the setting of PMB.

Polypoid tumours tend to cause more diffuse and irregular thickening than a polyp and more heterogeneity than endometrial hyperplasia.

A more specific US sign is irregularity of the endometrium-myometrium border, a finding that indicates invasive disease.
Endometrial carcinoma

Endometrial Adenocarcinoma

A more specific US sign is irregularity of the endometrium-myometrium border, a finding that indicates invasive disease.
Intra uterine fluid collections

Importance depends on the age of the patient

In premenopausal patients, fluid collections are most commonly associated with

- menstruation,
- early IUP,
- the pseudogestational sac in an ectopic pregnancy

Other benign causes of obstruction leading to intrauterine fluid production include polyps, infection and submucosal fibroids.
Endometrial cavity fluid

A small amount of fluid in the endometrial canal is likely related to benign cervical stenosis and does not require further evaluation.

Remember the bi layer measurement of the endometrium in that situation.

An intrauterine fluid collection in a postmenopausal patient, although possibly related to cervical stenosis, should raise concern for endometrial (or cervical) carcinoma.

An obstructing tumour must be excluded even when cervical stenosis has been identified clinically.
Intra uterine fluid collections

Importance depends on the age of the patient

In prepubertal patients, fluid in the endometrial canal may be related to haematometrocolpos.
Intra uterine fluid collections

Rarity !!!
Acquired Haematometra

Importance depends on the age of the patient

The clue is in the history

TALK TO YOUR PATIENT!!!
Intra uterine fluid collections

Rarity !!!
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TALK TO YOUR PATIENT!!!
Uncommon pathologies

Endometrial

• Endometrial adhesions

• AVM

• Osseous metaplasia
Endometrial adhesions

Endometrial adhesions are posttraumatic or postsurgical in nature and can cause Asherman syndrome, which includes infertility, recurrent pregnancy loss, and amenorrhea.

Adequate distention of the endometrial cavity seen at sonohysterography or HSG is necessary for radiologic diagnosis.

Sonohysterography may demonstrate synaechiae as echogenic bands bridging the uterine cavity.

If the bands are thick and fibrotic, they may prevent complete uterine distention.
Uncommon pathologies
Endometrial

AVM

These are actually very rare and typically arise following instrumentation of the endometrial cavity commonly in association with pregnancy loss or delivery.

They can be associated with:

- Malignancies
- Infections
- RPOCS
- Molar gestations

They can be congenital and these are even less common and less symptomatic than acquired variety.

Symptoms

- Heavy bleeding
- Pelvic pain and dyspareunia
Uncommon pathologies
AV Malformation

The diagnosis is made by TV ultrasound with colour and pulsed doppler

Grey scale ultrasound
Anechoic spaces with an irregular contour
Turbulent flow with aliasing and pulsed doppler demonstrates high velocity flow with low impedance
VERY Uncommon pathologies
Endometrial
Osseous metaplasia

Endometrial ossification is a rare disease, and its aetiology and pathogenesis are controversial.

It is often misdiagnosed.

Most reported cases are related to pregnancy – RPOCS
It has also been related to transformation of uterine tissue to bone in response to inflammation and the reparative process induced by abortion
Osseus metaplasia has been associated with secondary infertility and dysmenorrhea and has mimicked a retained intrauterine device
It can be successfully treated with hysteroscopic resection.
Prolonged haematometra
Key points

• Meticulous scan technique: always strive to
  – Visualise the cervix
  – Define the endometrium
  – Find the ovaries
  – Find the answer
• Fibroid diagnosis is not enough, it is also about location location location
• Size matters but it is the cause that is crucial
• Talk to your patients, the clue is often in the history especially in the weird and wonderful
The End

Thank you for your attention
Questions please?