



# ISUOG Basic Training

## Typical Ultrasound Appearances of Common Pathologies in the Adnexae

# Learning objectives

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

- Compare the differences between typical normal and common abnormal appearances of the adnexa in gynaecological ultrasound examination

# Key questions

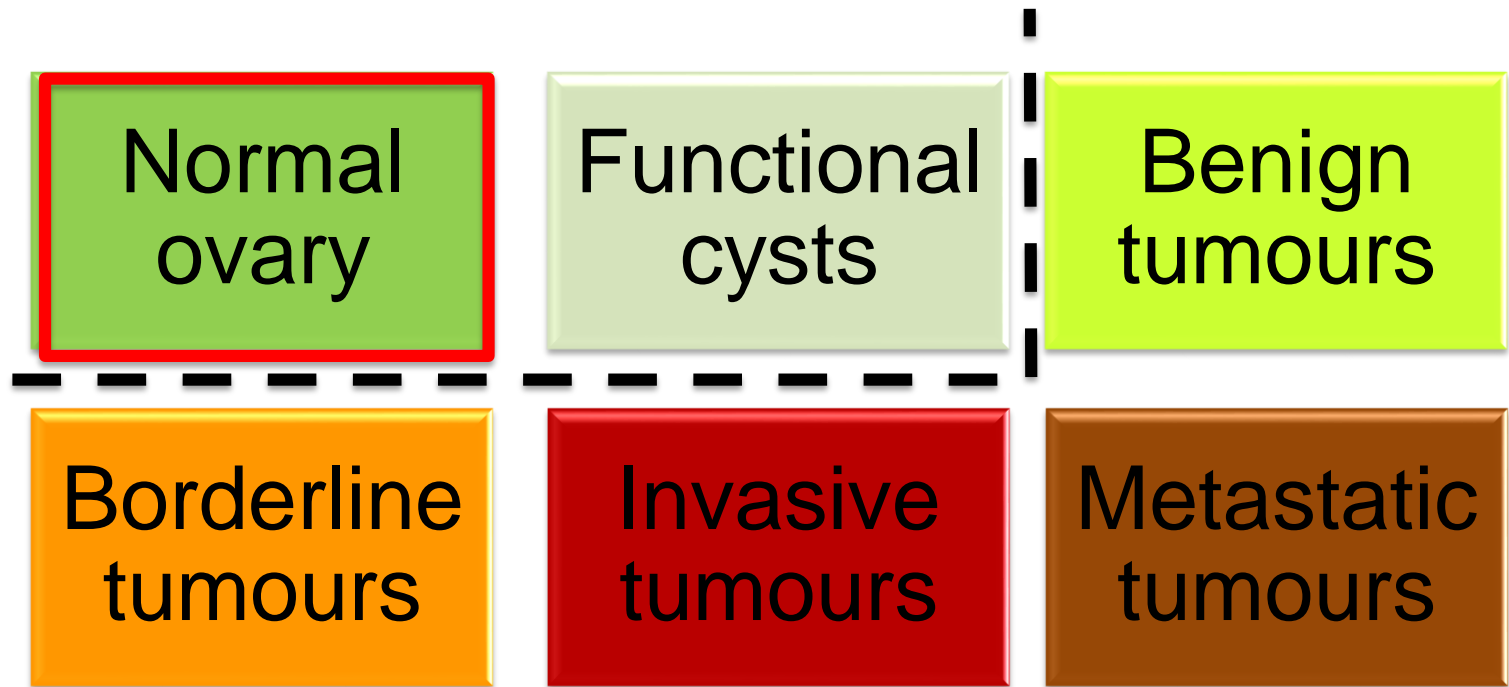
- How do I describe my ultrasound findings using the standardized International Ovarian Tumor Analysis (IOTA) terminology?
- What are the typical ultrasound appearances of the most common pathologies in the adnexa?
- What diagnostic methods can I use to discriminate between benign and malignant adnexal pathology?
- Which patients should I refer for specialist opinion?

# Key points

- Understand the typical ultrasound features of a normal pre- and post-menopausal ovary
- Understand the typical ultrasound appearances of the most common pathologies in the adnexa
- Understand how to use IOTA terminology
- Know when to refer for a specialist opinion

# Typical ultrasound appearances of the most common pathologies in the adnexa

# Ovarian findings



# Normal ultrasound findings

- Differ between women before and after menopause
- Changes throughout the menstrual cycle

# How big is a normal ovary in a woman of fertile age?

Very variable

- Median 7 ml
- Range 2-17 ml
- (Range 1-20 ml)

303 women 20-39 years old with regular menstrual cycles, cd 4-8

Jokubkiene et al. J Ultrasound Med 2012;31(10):1635-49



# Normal ovary

# What is a normal number of antral follicles before menopause?

## Text books:

6-7 follicles/ovary

## Jokubkiene et al:

Median 11 follicles (2-10 mm) /ovary

Range 1-36

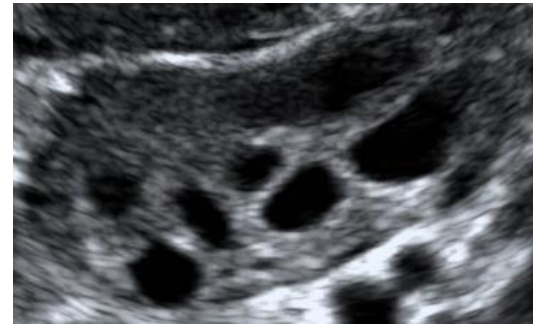
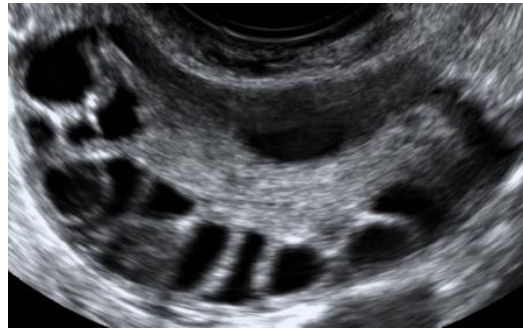
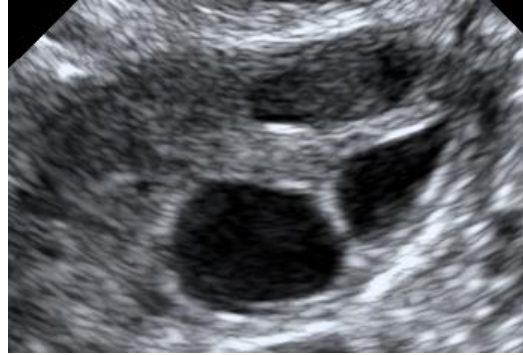
10th-90th percentile 4-20

57% had  $\geq 12$  follicles/ovary, i.e.

PCO\*

\*PCO :  $\geq 12$  follicles/ovary

or ovary  $\geq 10$  ml (Rotterdam)



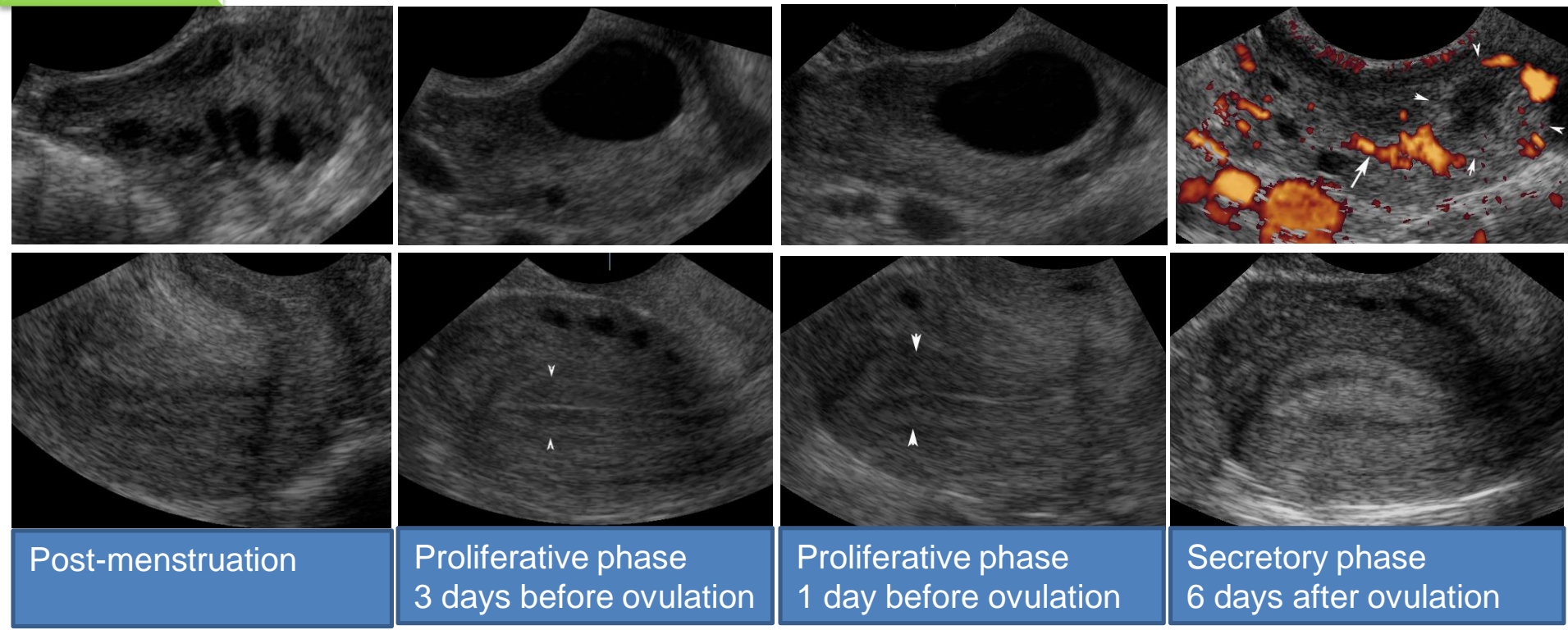
# How big is a normal ovary in a postmenopausal woman?

- Median 1x1x2 cm
- Median volume 1 ml
  - range: 0.4 - 4 ml

144 asymptomatic postmenopausal women, 45-64 years old

Normal  
ovary

# Changes during the menstrual cycle



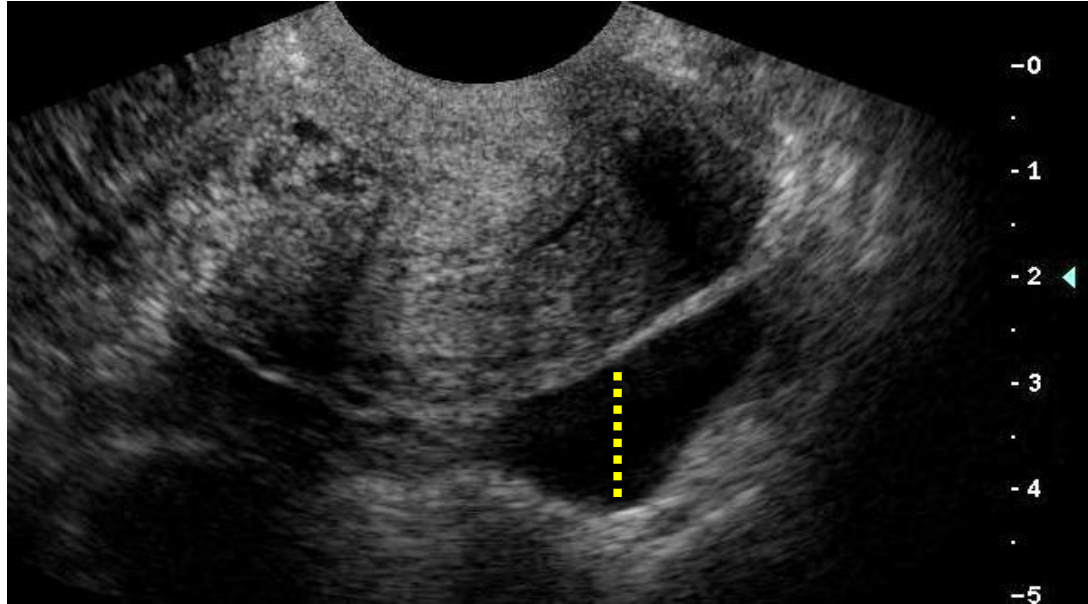
Post-menstruation

Proliferative phase  
3 days before ovulation

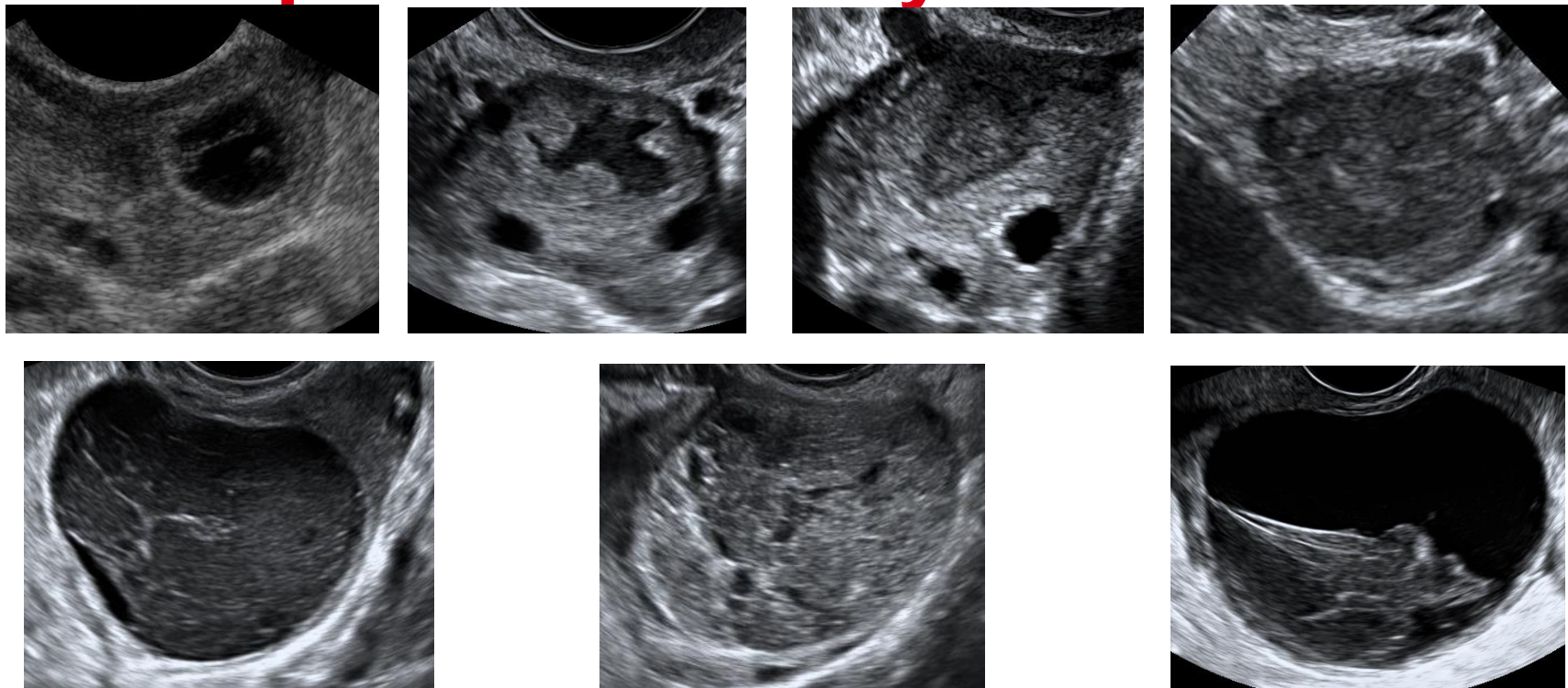
Proliferative phase  
1 day before ovulation

Secretory phase  
6 days after ovulation

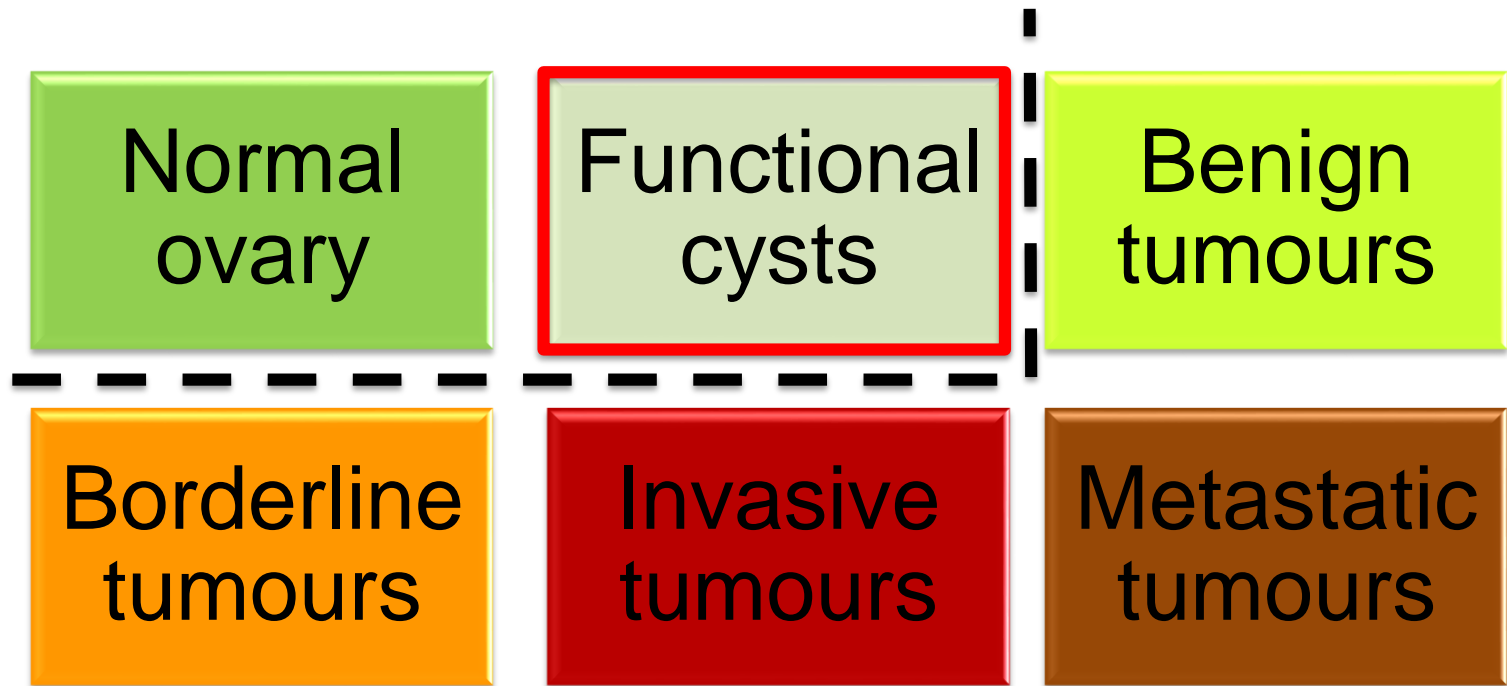
# Some fluid in the pouch of Douglas is **NORMAL** before menopause



# A corpus luteum may look different



# Ovarian findings



Functional  
cysts

# Follicular cyst / simple cyst



Functional  
cysts

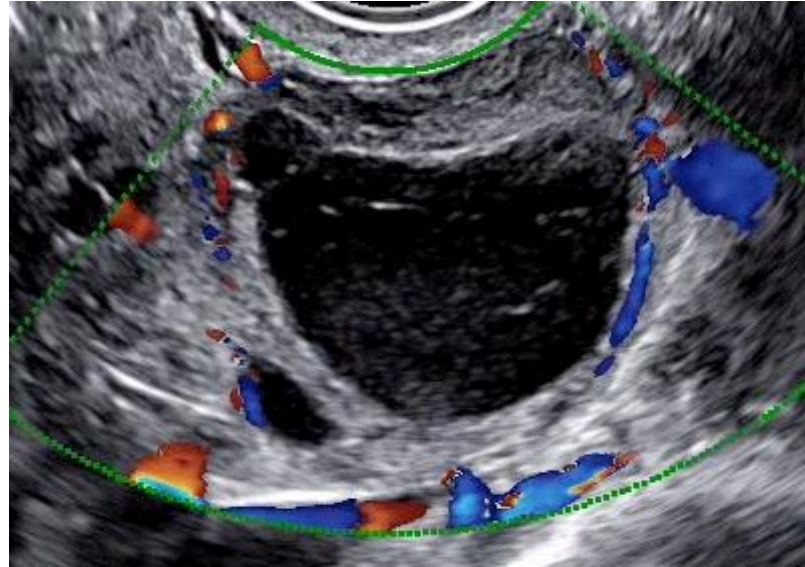
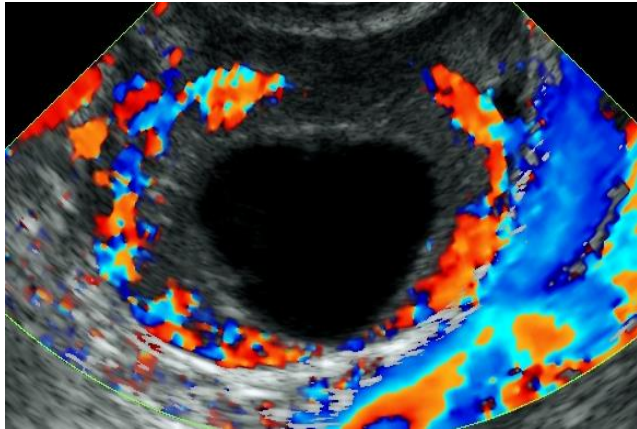
# Corpus luteal cyst



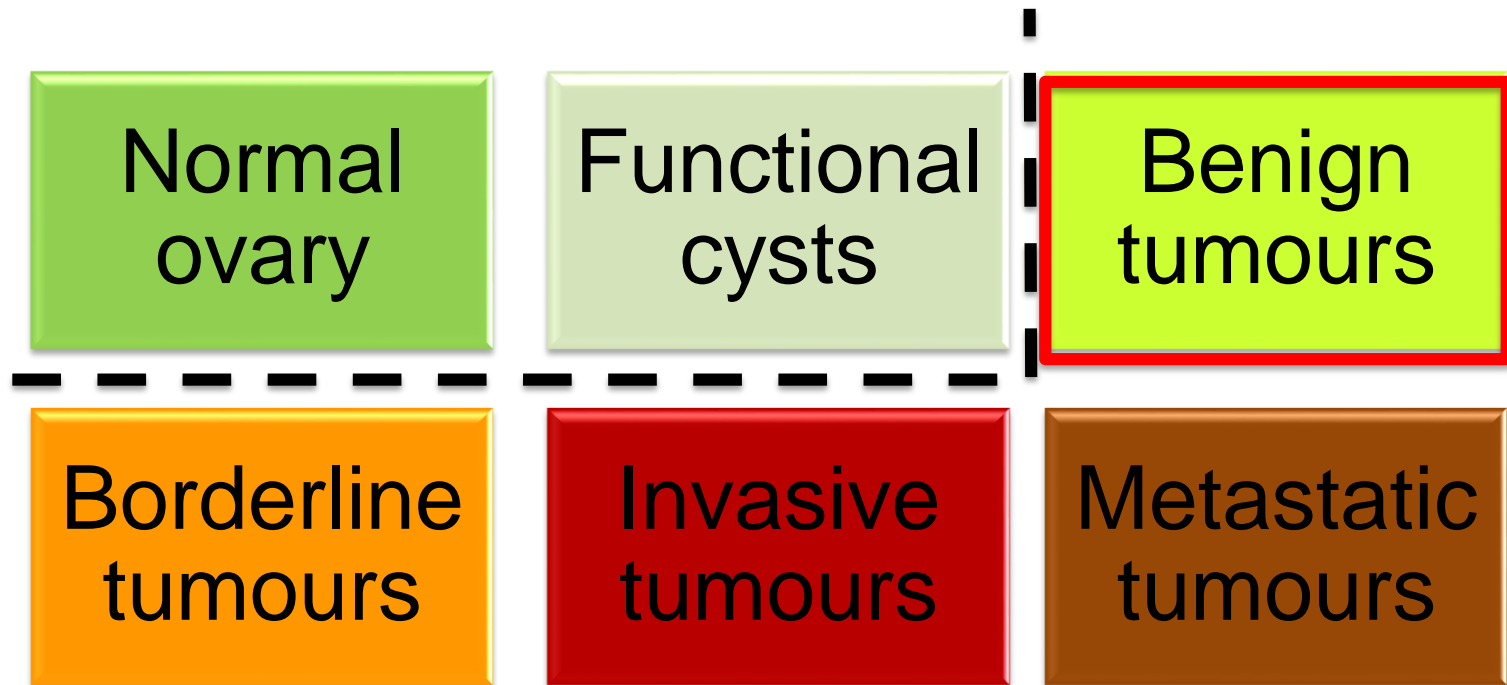


## Functional cysts

# Corpus luteal cyst



# Ovarian findings



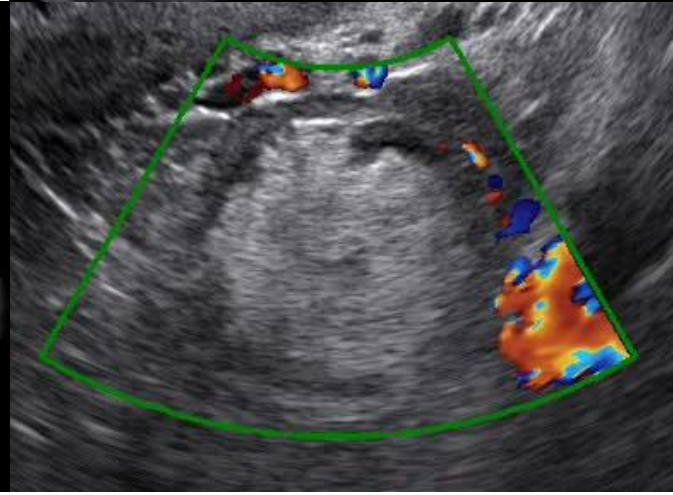
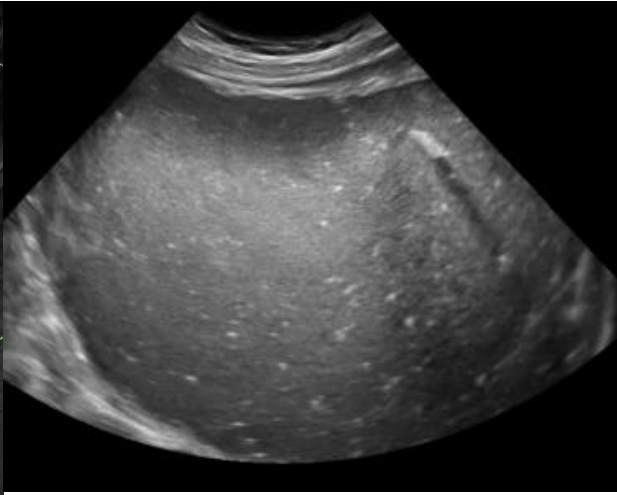
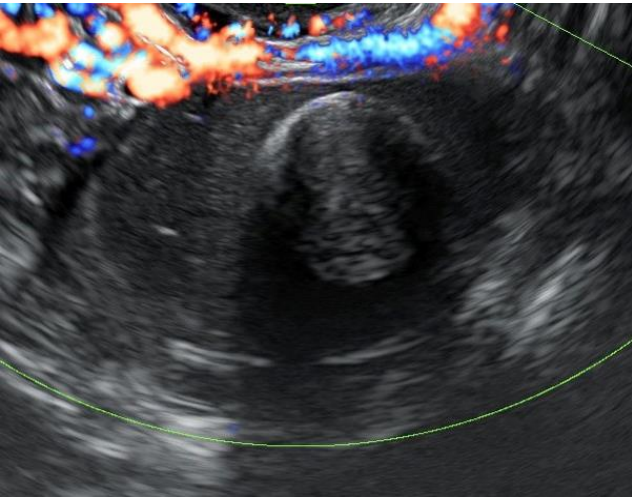
# Benign tumours

## Common ovarian pathology

- Dermoid/mature teratoma
- Endometrioma
- Serous cystadenoma/cystadenofibroma
- Mucinous cystadenoma
- Fibroma

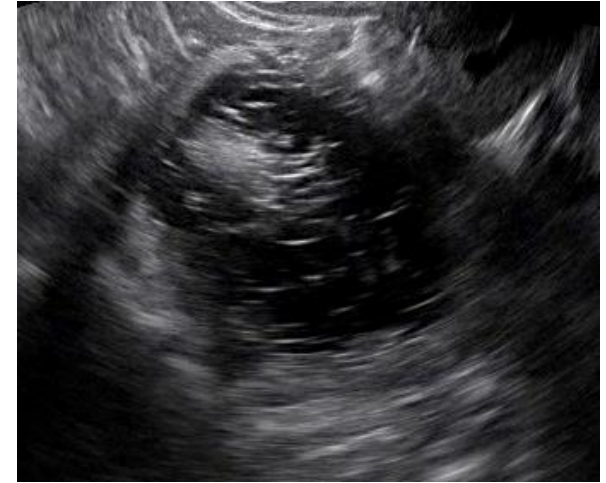
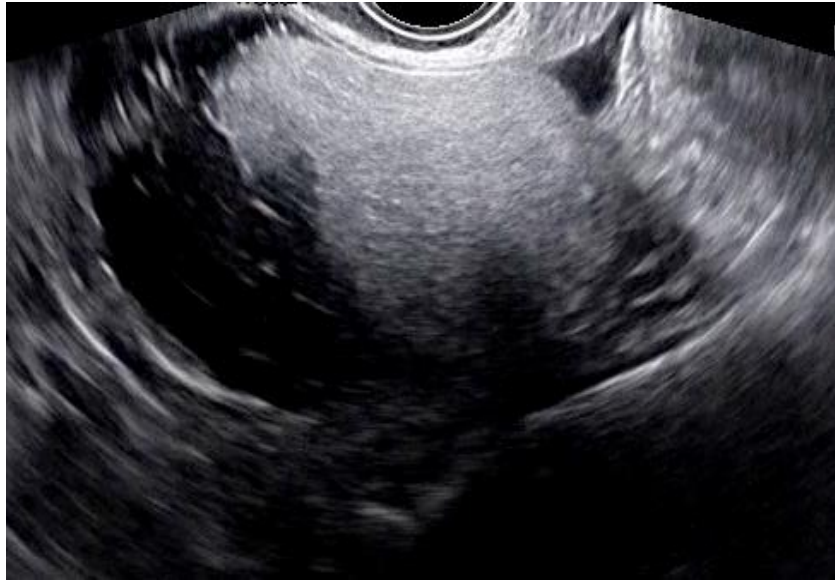
Benign  
tumours

# Dermoid cyst



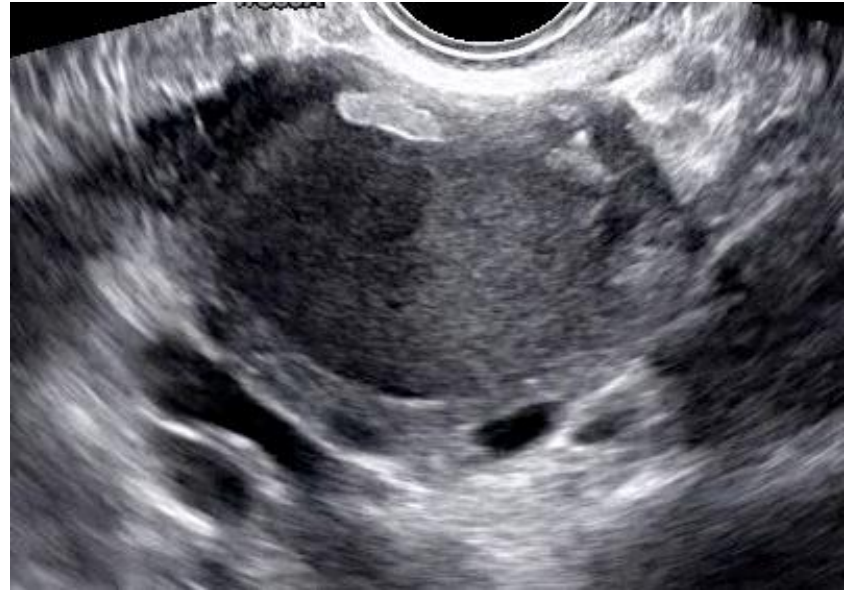
Benign  
tumours

## Dermoid cyst



Benign  
tumours

# Endometrioma



Benign  
tumours

# Cystadenoma/ cystadenofibroma



# Benign tumours

## Fibroma



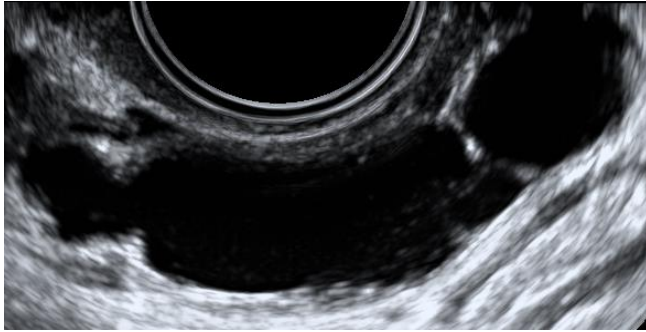


# Benign tumours

## Common extra-ovarian adnexal pathology

- Hydrosalpinx
- Paraovarian cysts
- Peritoneal inclusion cysts/ pseudocysts

# Hydro-pyo-haemato-salpinx



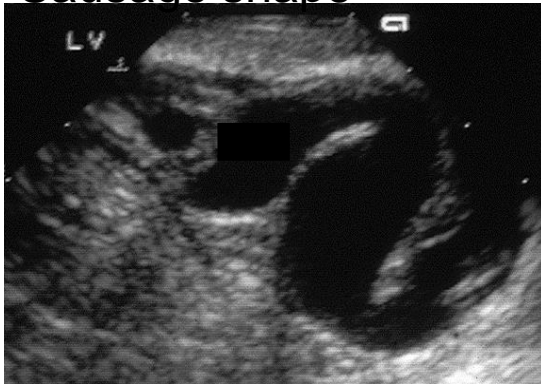
Sausage shape



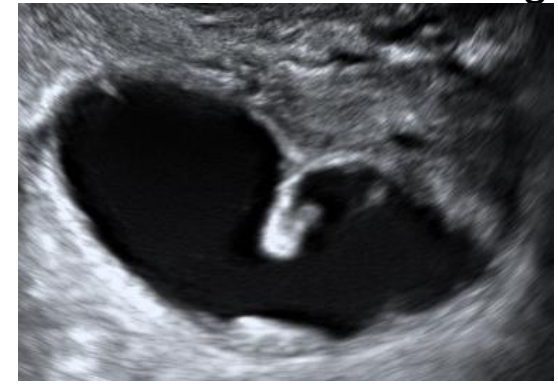
Cog wheel



Beads on a string



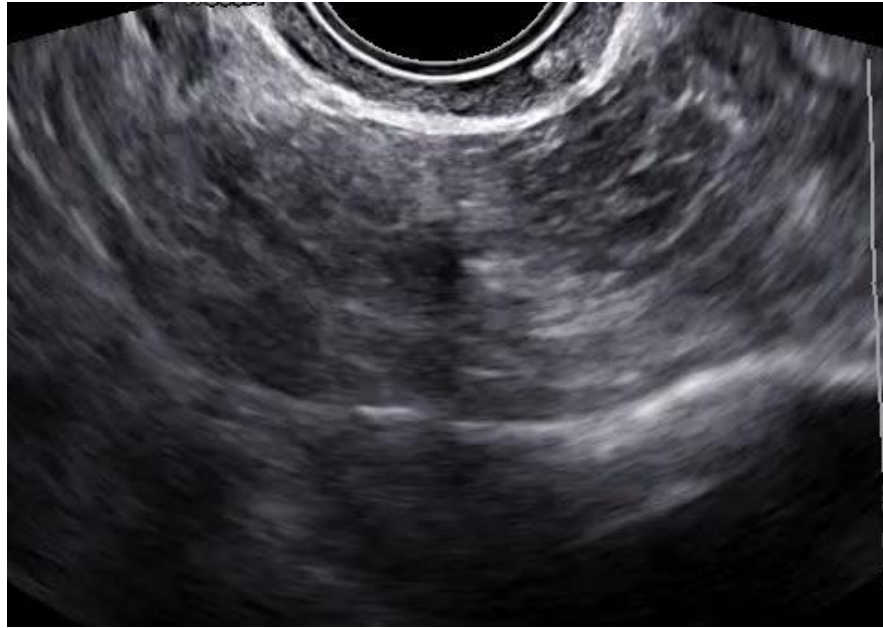
Incomplete septa



Incomplete septa

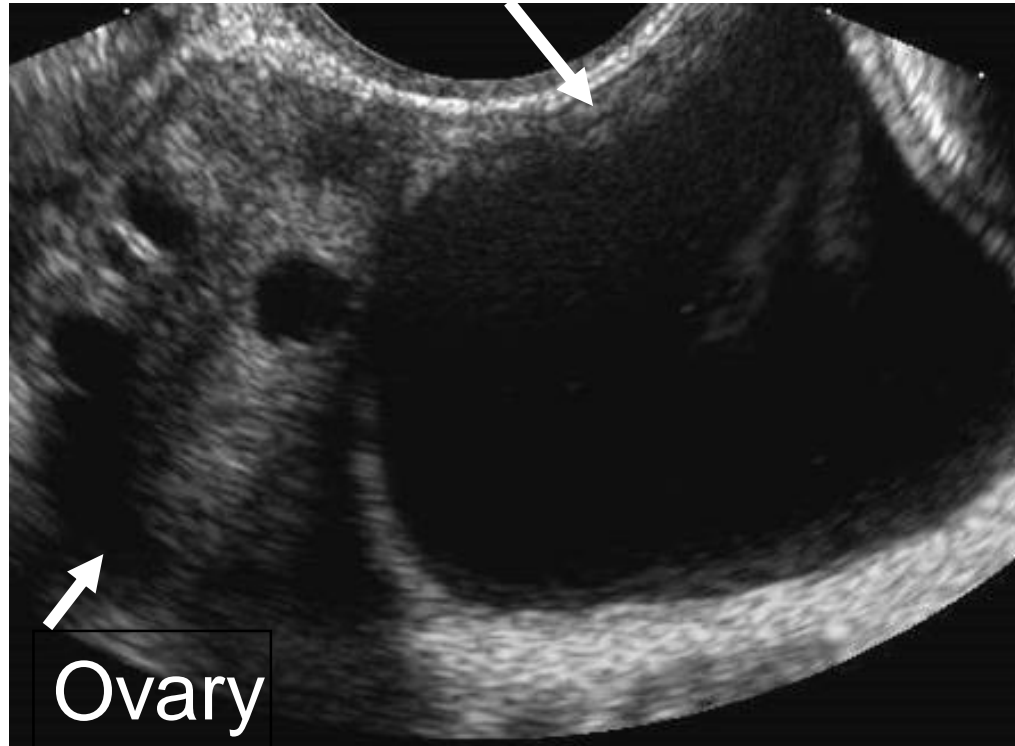
Benign  
tumours

# Hydrosalpinx



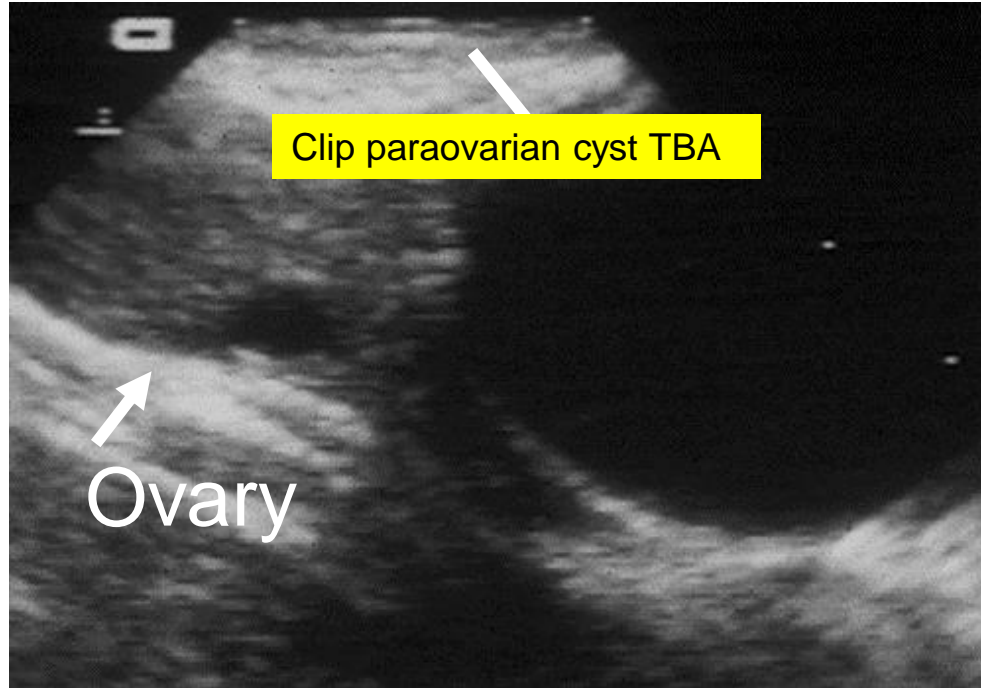
# Benign tumours

## Paraovarian cyst

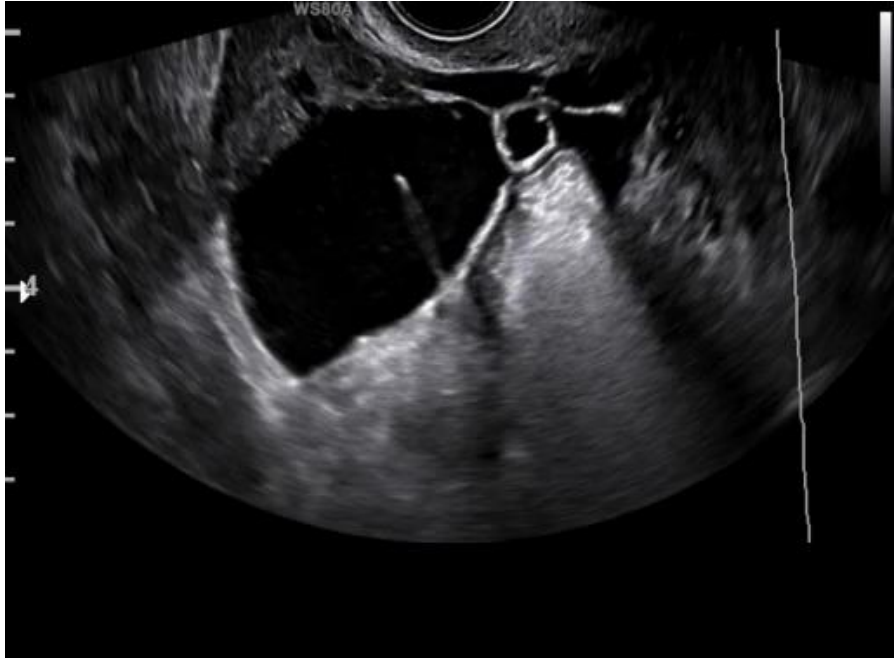


# Benign tumours

# Paraovarian cyst

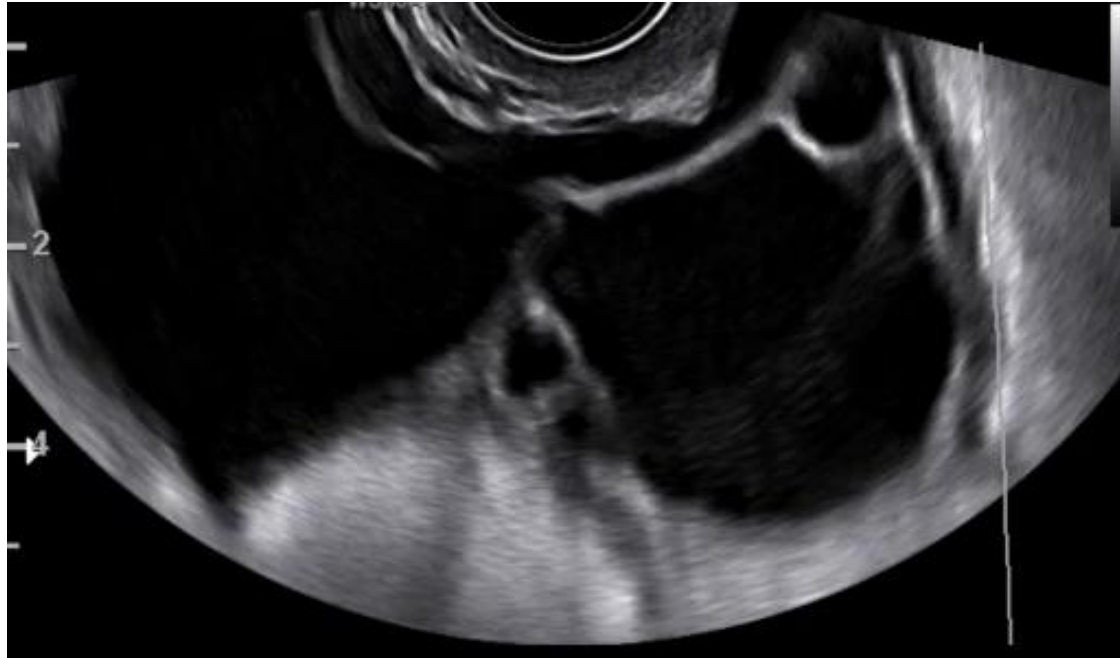


# Peritoneal pseudocyst

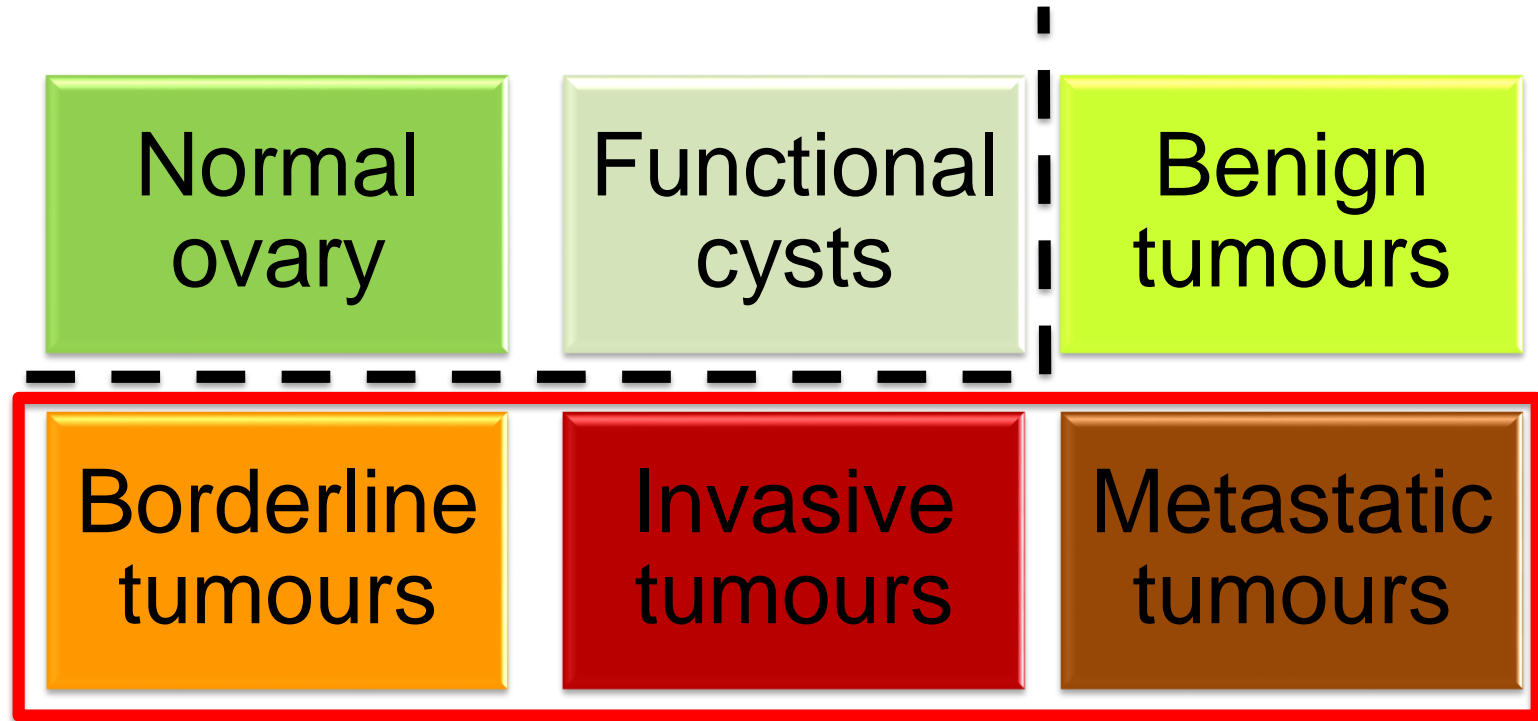


Benign  
tumours

# Peritoneal pseudocyst



# Ovarian findings





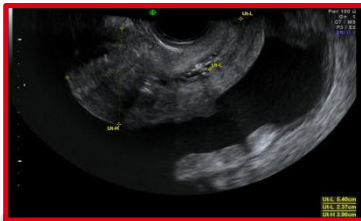
# Diagnostic methods to discriminate between benign and malignant adnexal pathology

# IOTA Simple Rules

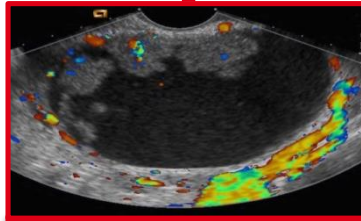
## Malignant features



**Irregular solid tumor**



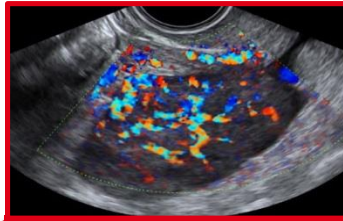
**Presence of ascites**



**≥ 4 papillary projections**



**Irregular multilocular-solid tumor ≥ 100mm**

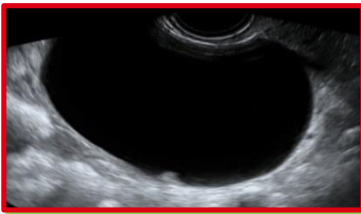


**colour score 4 (strong blood flow)**

## Benign features



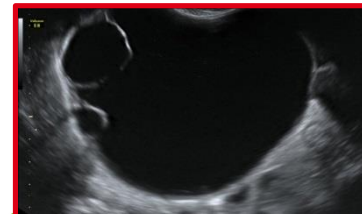
**Unilocular cyst**



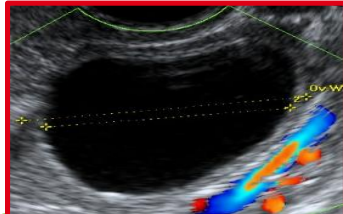
**Tumor with largest solid component < 7mm**



**Acoustic shadows**



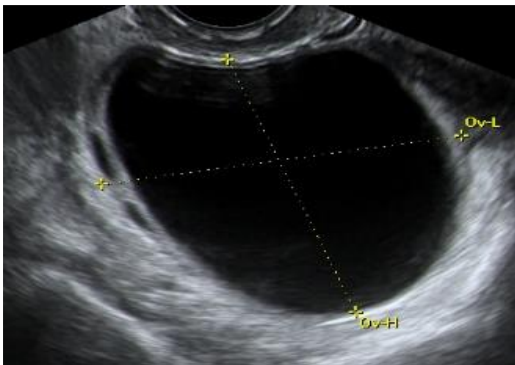
**Smooth multilocular tumor < 100mm**



**colour score 1 (no blood flow)**

# Simple Rules

- **Malignant** if *one or more* M-features apply *without* presence of B-features
- **Benign** if *one or more* B-features apply *without* presence of M-features
- Inconclusive if *no* features present or if *both* B and M-features apply



**Benign Tumour**



**ADNEX  
Assessment of Different  
NEoplasias in the adneXa**

The ADNEX-model computes the risk that a detected adnexal mass for which surgery is indicated is benign, borderline, stage I invasive, stage II-IV invasive, or metastatic cancer to the adnexa.

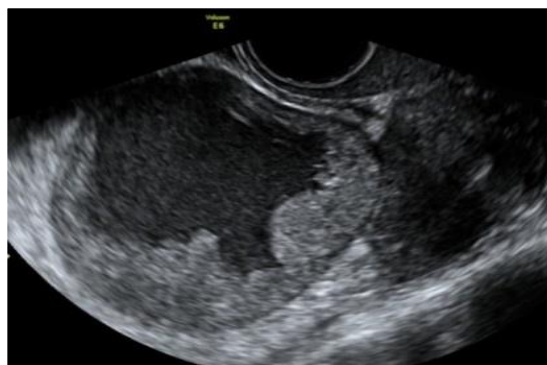
**Start Analysis**



**Borderline Tumour**



**FIGO Stage II-IV Ovarian cancer**



**FIGO Stage I Ovarian cancer**



**Metastasis to the ovary**

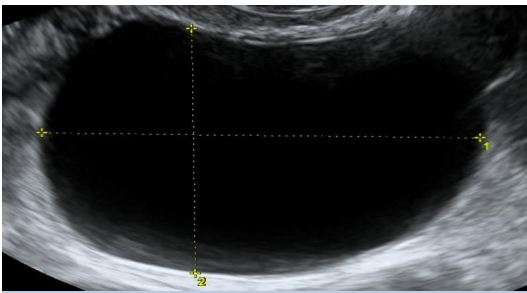
# IOTA-ADNEX (Assessment of Different NEoplasias in the adneXa) variables

Age of patient

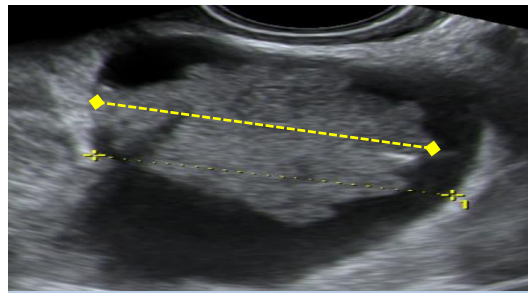
Type of centre

Serum CA-125

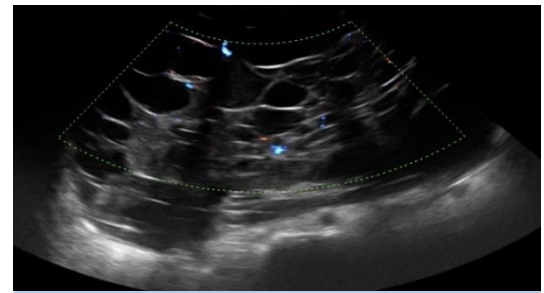
Six ultrasound variables



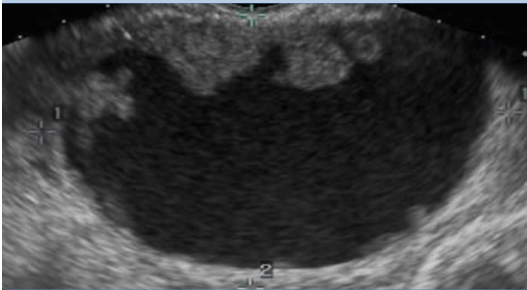
(1) maximum diameter of lesion (mm)



(2) proportion of solid tissue



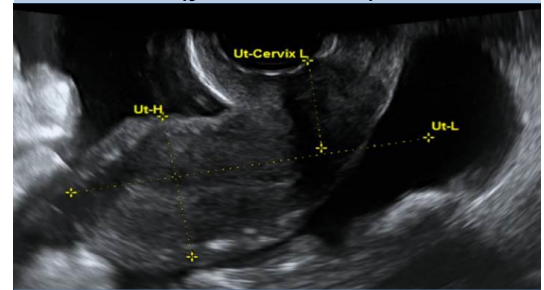
(3) more than 10 cyst locules (yes vs no)



(4) number of papillary projections (0, 1, 2, 3, more than 3)




(5) acoustic shadows (yes vs no)



(6) ascites (yes vs no)

# IOTA-ADNEX (Assessment of Different NEoplasias in the adneXa) app

Welcome Results



**ADNEX**  
Assessment of Different  
NEoplasias in the adneXa

The ADNEX-model computes the risk that a detected adnexal mass for which surgery is indicated is benign, borderline, stage I invasive, stage II-IV invasive, or metastatic cancer to the adnexa.

**Start Analysis**

diameter of the largest solid part  ?

More than 10 locules?  ?

Number of papillations (papillary projections)  ?

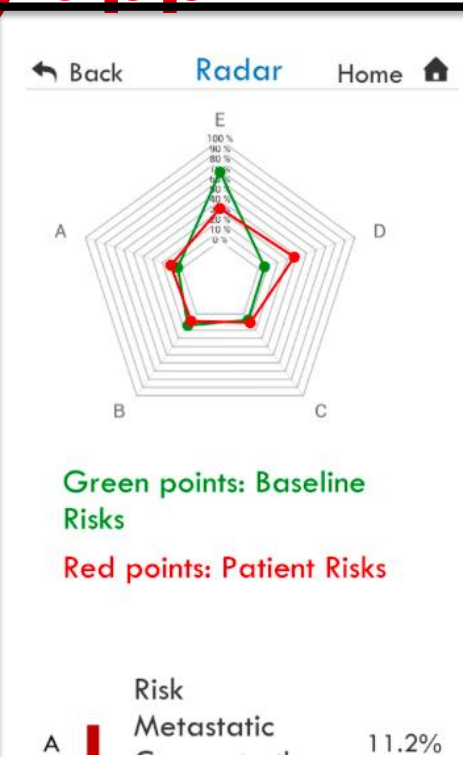
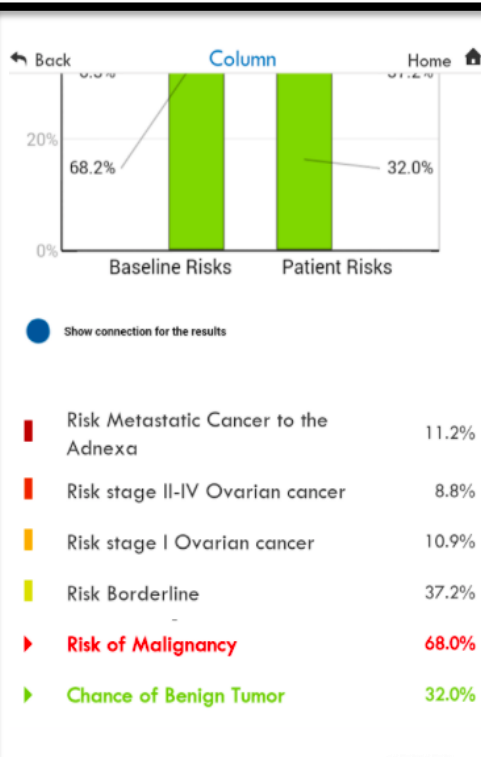
Acoustic shadows present?  ?

Ascites (fluid outside pelvis) present?

CA-125 (U/ml)

**Results**

**Clear data**



# 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**



ISUOG Basic Training by [ISUOG](https://www.isuog.org) is licensed under a [Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License](https://creativecommons.org/licenses/by-nc-nd/4.0/).

Based on a work at <https://www.isuog.org/education/basic-training.html>.

Permissions beyond the scope of this license may be available at <https://www.isuog.org/>