



ISUOG Basic Training

Examining the Ovaries and Adnexa

Learning objectives

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

- Use International Ovarian Tumor Analysis (IOTA) terms, definitions and measurements

Key questions

1. How do I describe my ultrasound findings using the standardised (IOTA) terminology?
2. How do I measure different components of an adnexal lesion?
3. How do I assess and describe vascular flow in adnexal lesions?

Key points

- Understand how to use IOTA terminology
- Understand how to assess and measure different components of an adnexal lesion
- Understand how to arrange ultrasound settings to assess vascular flow in ovarian lesions

International Ovarian Tumor Analysis (IOTA)

Terms, definitions and measurement methods

Definitions

- Ovarian lesion
- Solid component
- Papillary projection – cyst wall irregularity
- Complete – incomplete septum
- Five tumor types
- Different types of cyst content
- Acoustic shadowing
- Colour score
- Ascites

Ovarian lesion

Ultrasound Obstet Gynecol 2000; 16: 500–505.

Terms, definitions and measurements to describe the sonographic features of adnexal tumors: a consensus opinion from the International Ovarian Tumor Analysis (IOTA) group

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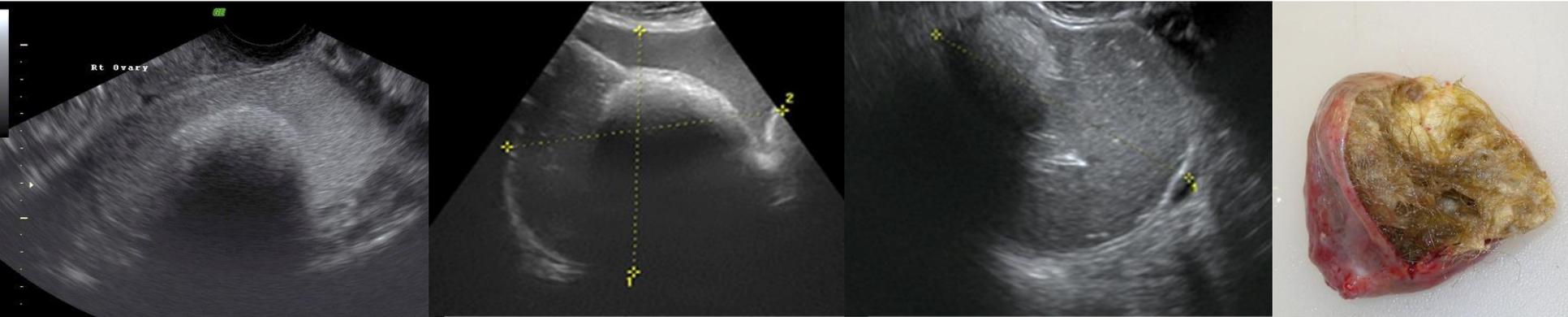
- Part of an ovary inconsistent with normal physiology
- Adnexal mass inconsistent with normal physiology

IOTA definition of a solid component

- A structure that has (high) echogenicity suggestive of *tissue* (myometrium, myomas, fibromas)

IOTA definition of a solid component

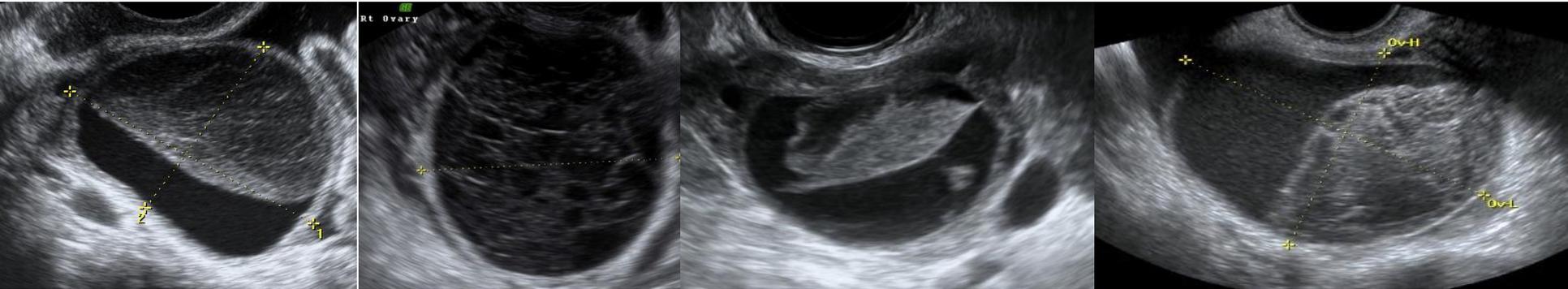
- The white ball in a dermoid cyst is **NOT** solid tissue



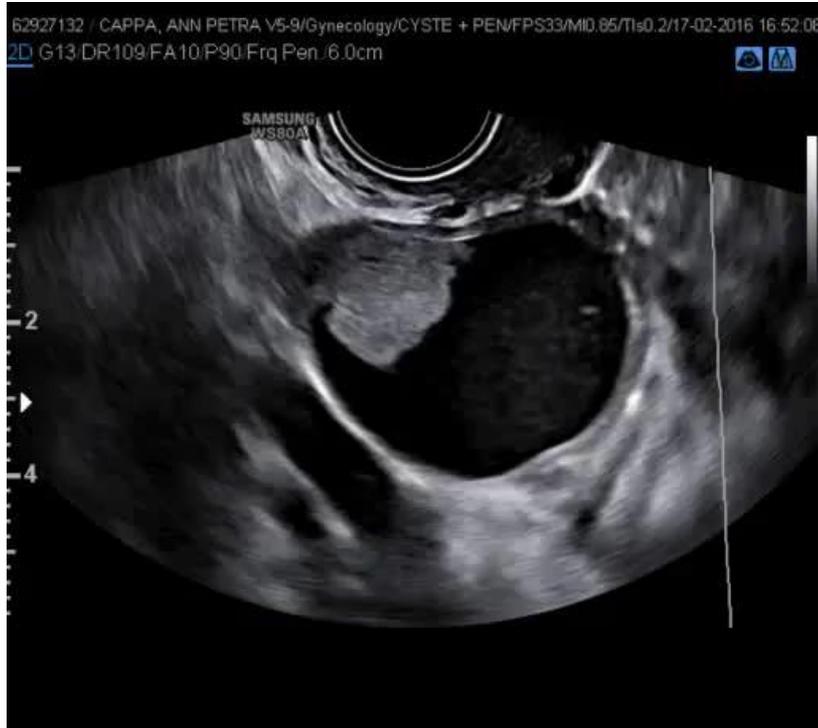
IOTA definition of a solid component

- Blood clot, amorphous material or solid tissue?
- Push on the lesion
- Use color doppler

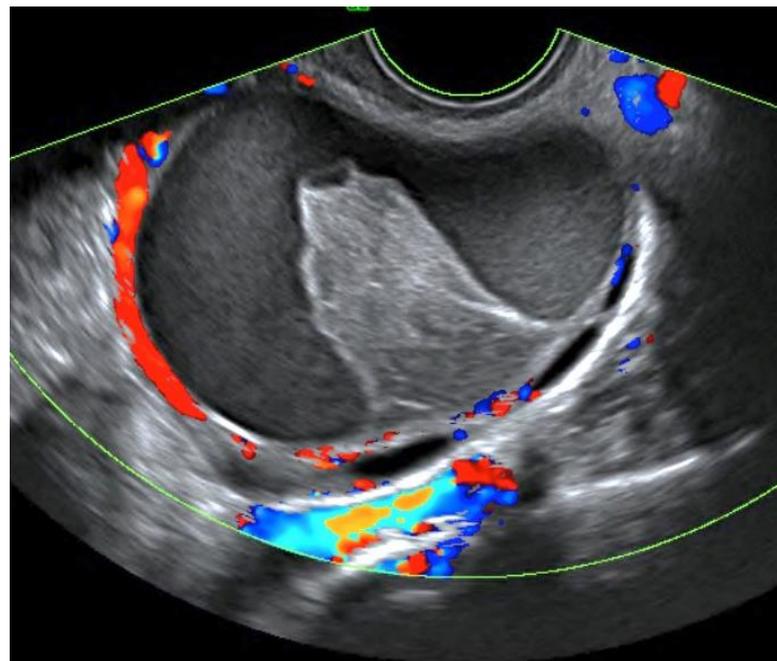
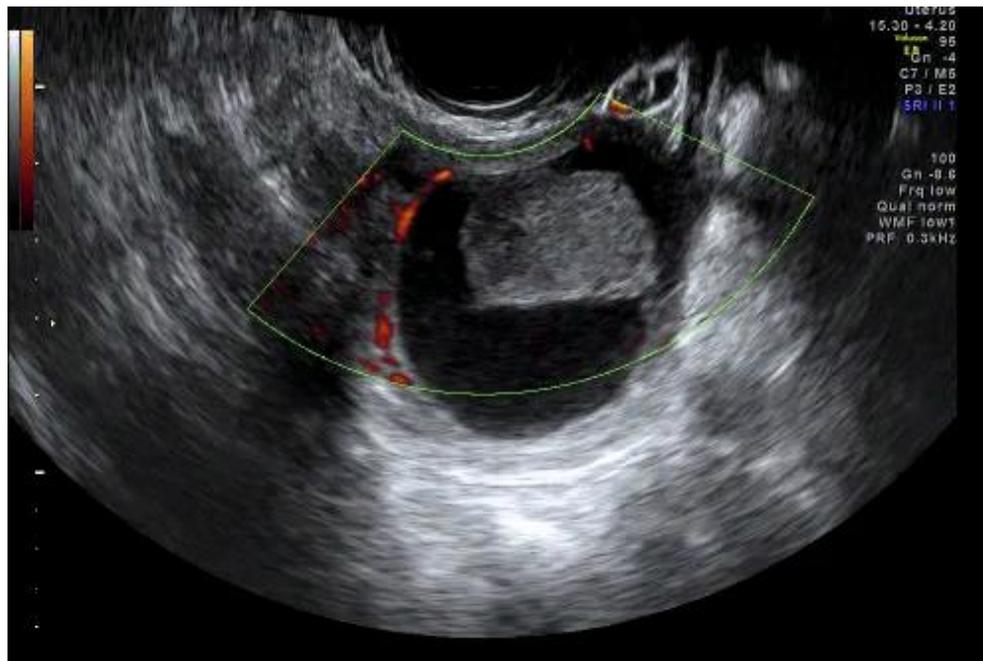
If in doubt – classify as solid tissue!



Push on the lesion

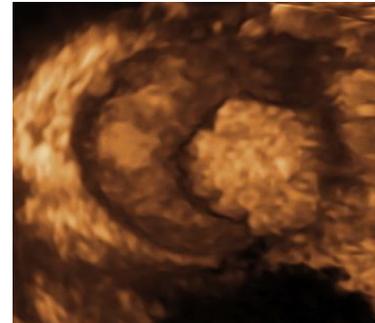
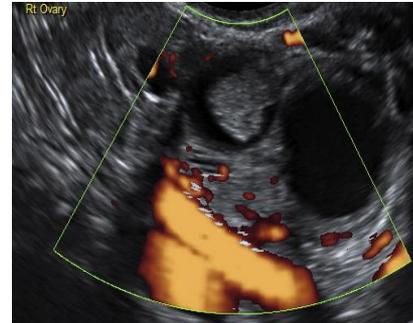
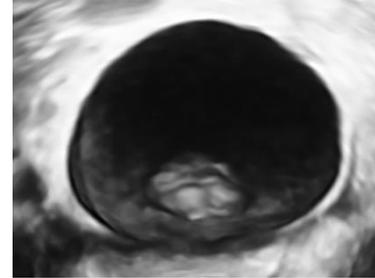
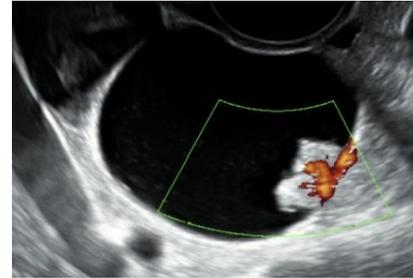
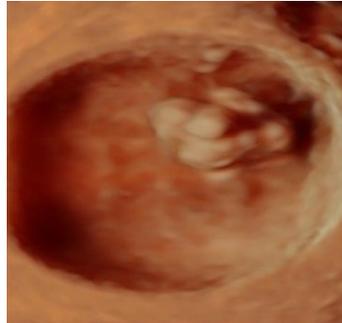


Use colour Doppler

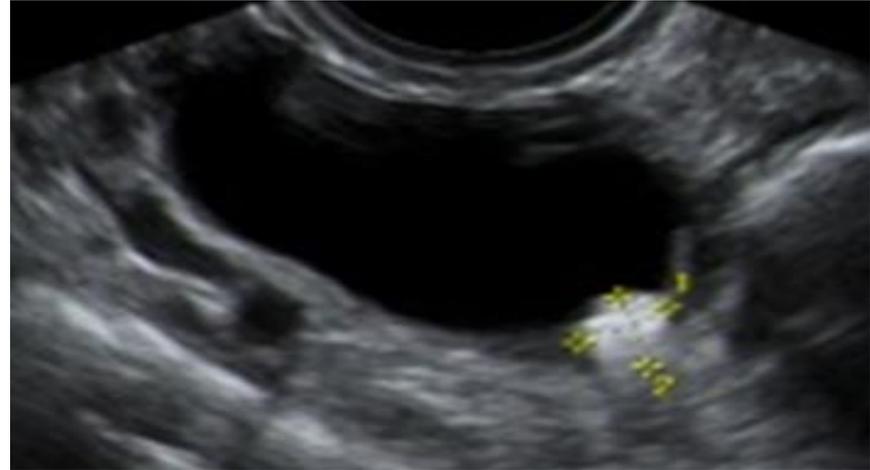
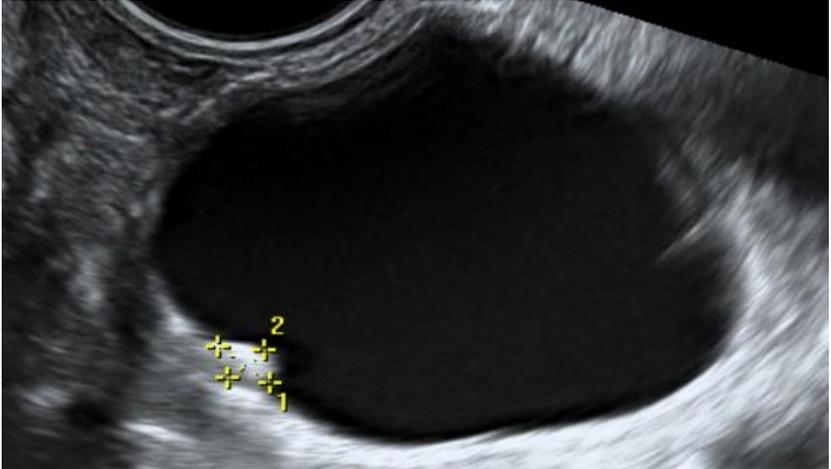


IOTA definition of a papillary projection

- A papillary projection is any solid protrusion into the cyst cavity from the cyst wall with a height of $\geq 3\text{mm}$
- Papillary projection = solid tissue

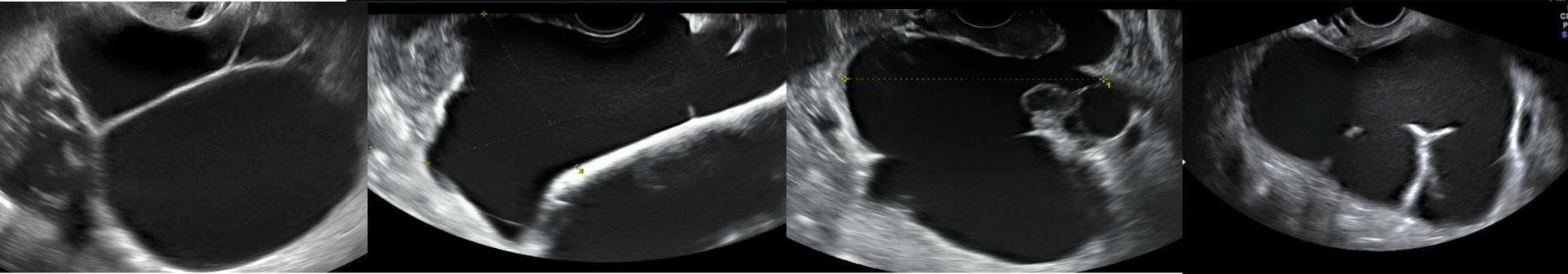


A protrusion <3mm: cyst wall irregularity



IOTA definition of septum and incomplete septum

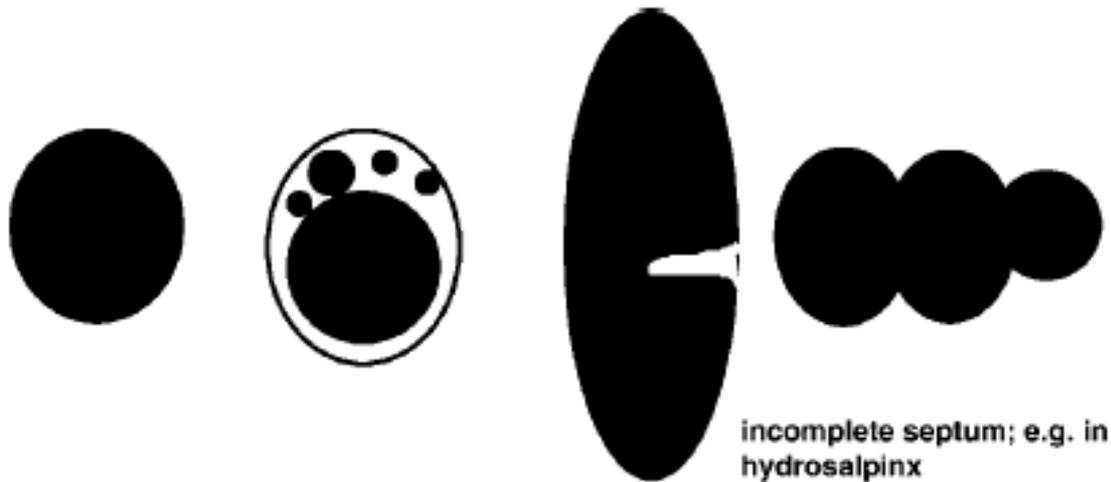
- **Septum** = thin strand of tissue that runs from one internal cyst surface to another
- **Incomplete septum** = thin strand of tissue that does not reach the opposite wall of the cystic structure in some scanning planes (seen in diseased tubes)



Five types of lesions

- Unilocular
- Unilocular-solid
- Multilocular
- Multilocular-solid
- Solid

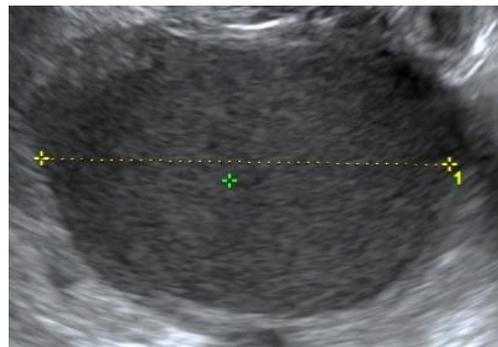
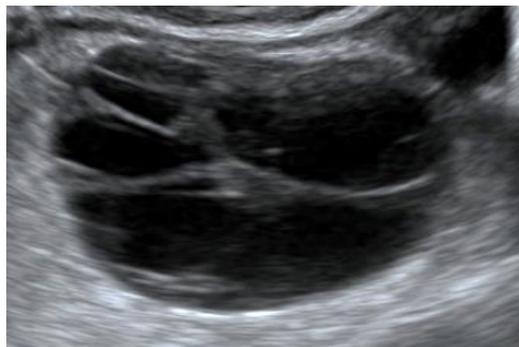
Unilocular



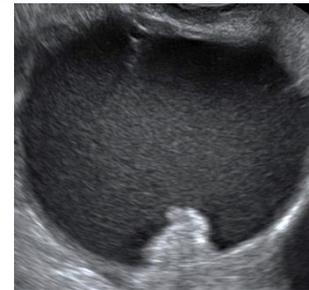
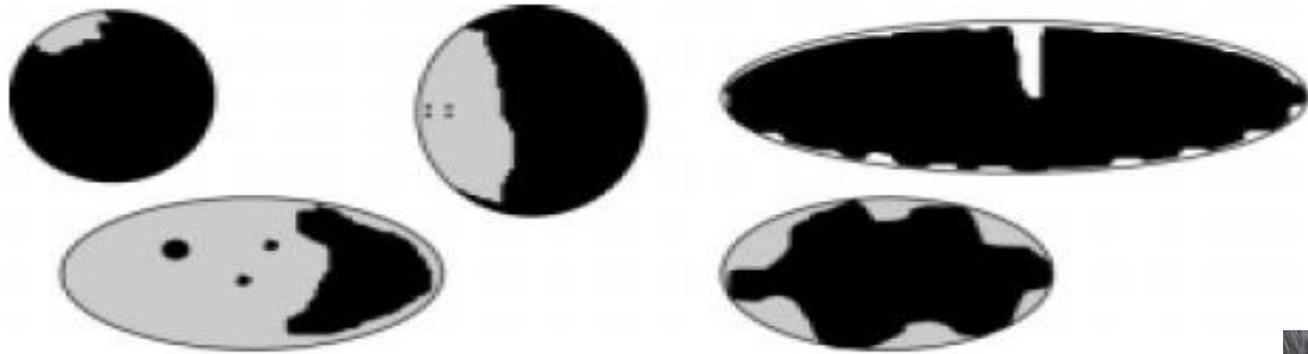
Timmerman et al. Ultrasound Obstet Gynecol, 2000,16:500-5

Definition of a unilocular cyst

- ONE cyst locule
- No complete septa
- No solid components
- Any type of cyst fluid

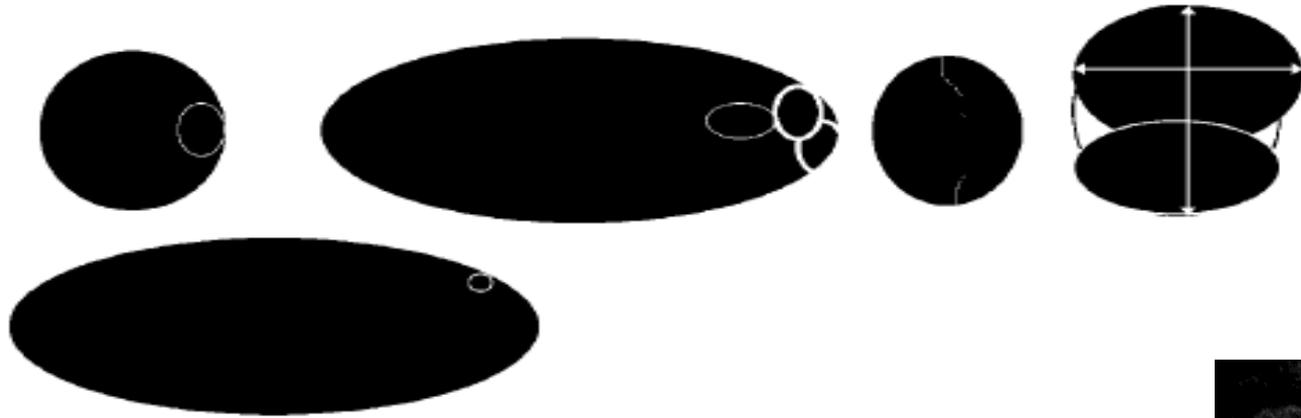


Unilocular-solid



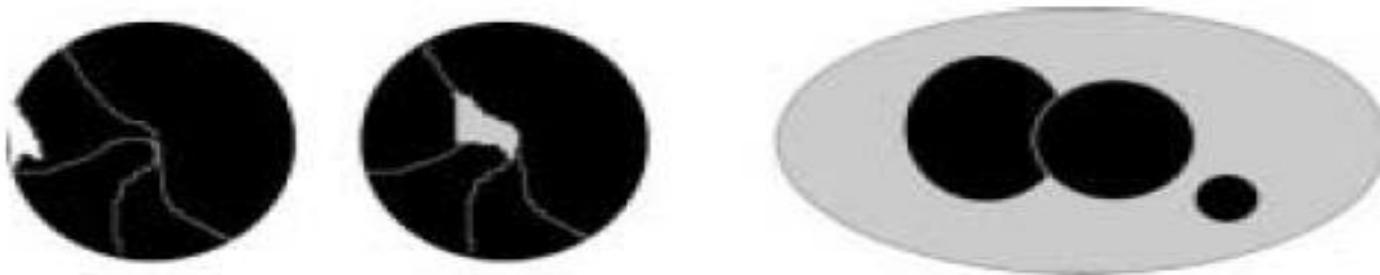
Timmerman et al. Ultrasound Obstet Gynecol, 2000,16:500-5

Multilocular



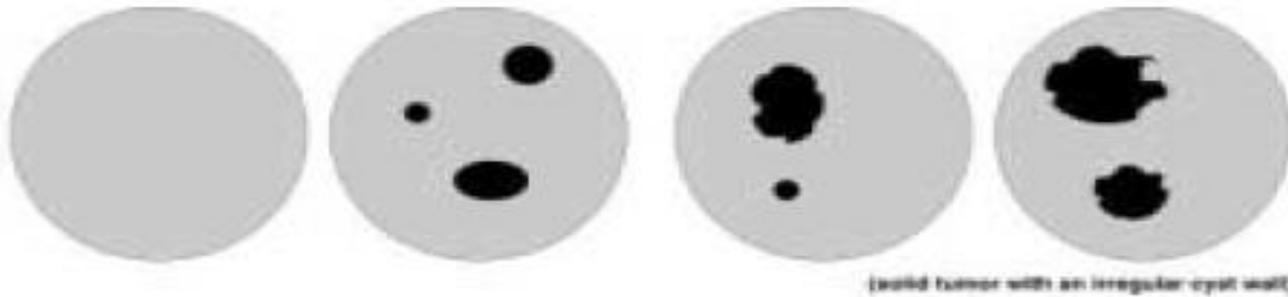
Timmerman et al. Ultrasound Obstet Gynecol, 2000,16:500-5

Multilocular-solid



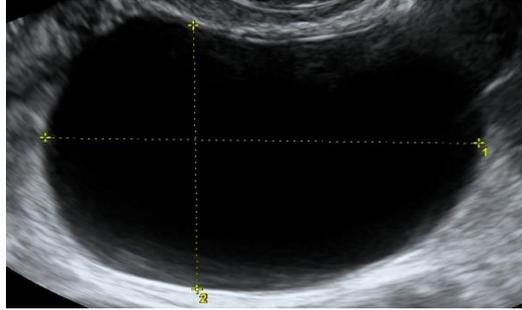
Timmerman et al. Ultrasound Obstet Gynecol, 2000,16:500-5

Solid

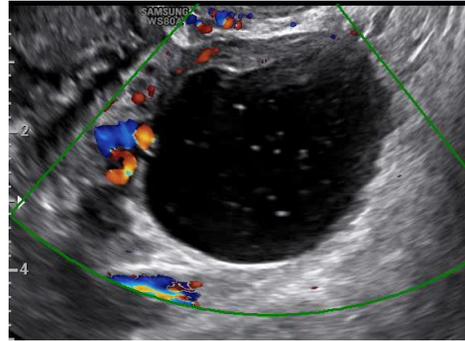


Timmerman et al. Ultrasound Obstet Gynecol, 2000,16:500-5

Five types of cyst content



Anechoic



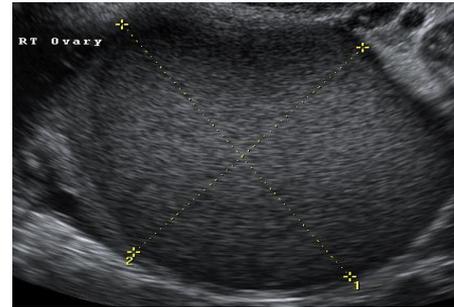
Low level



Hemorrhagic



Mixed



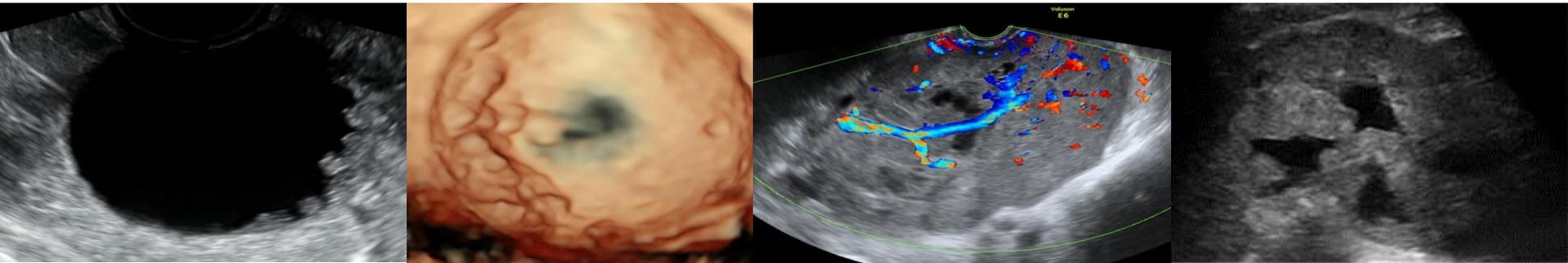
Ground glass

Acoustic shadowing



Irregular cyst wall

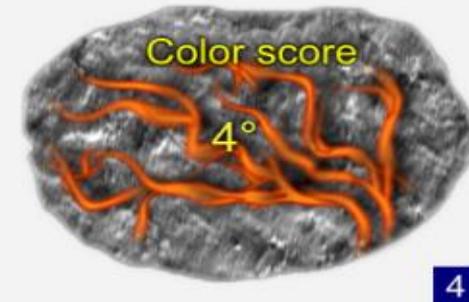
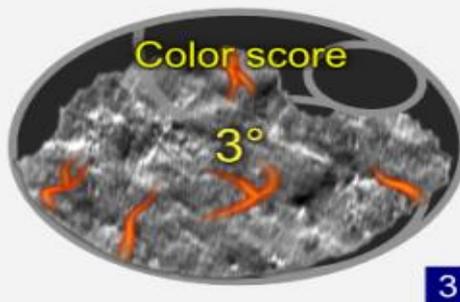
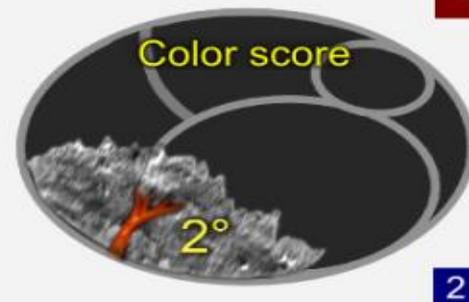
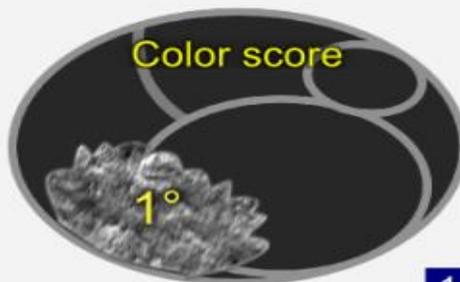
- Irregularity in the inner wall of a cyst
- Irregularity of outer contour of a solid tumor or irregularity of the inner wall of a cystic component in a solid tumor



Colour score

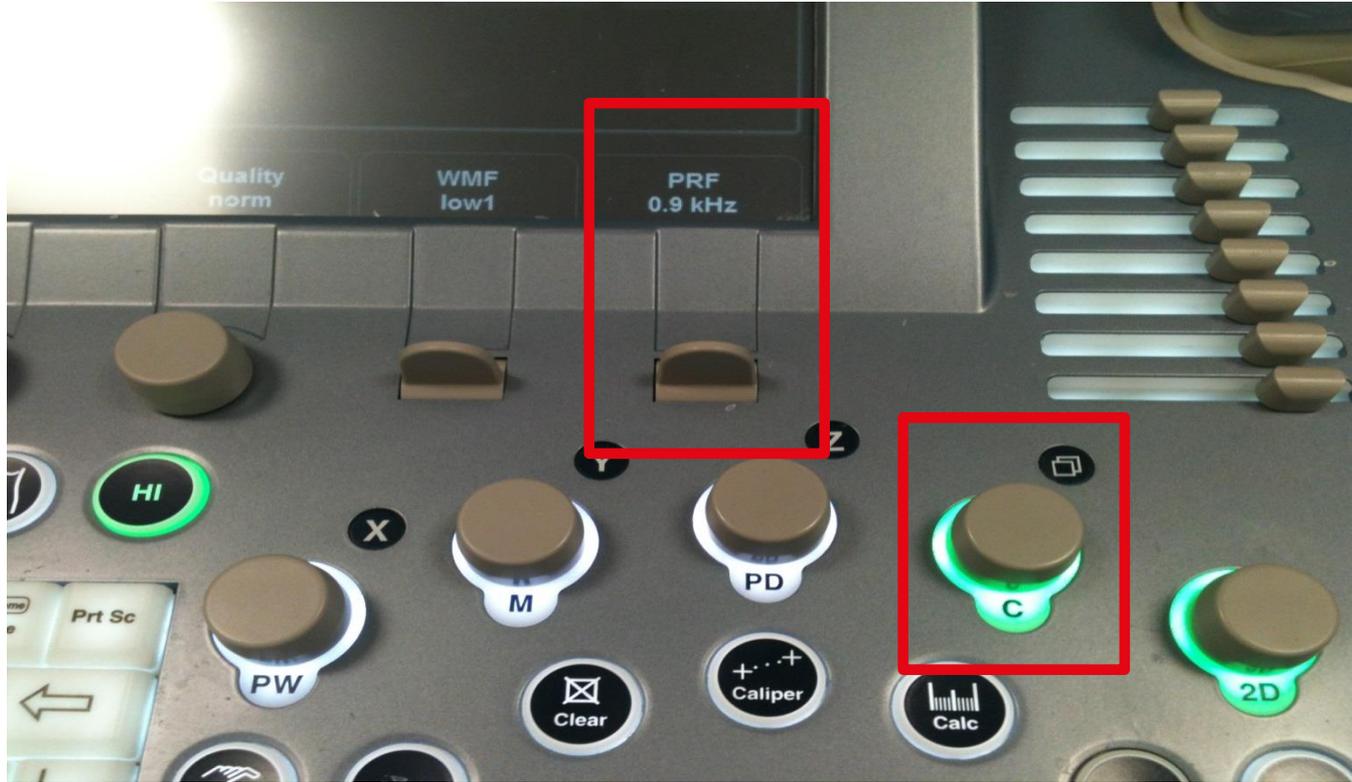
Subjective assessment of blood flow

- 1 Color score of 1** is given when no blood flow within the septa, cyst walls, or solid tumor areas.
- 2 Color score of 2** is given when only minimal flow can be detected.
- 3 Color score of 3** is given when moderate flow is present.
- 4 Color score of 4** is given when the adnexal mass appears highly vascular with marked blood flow.



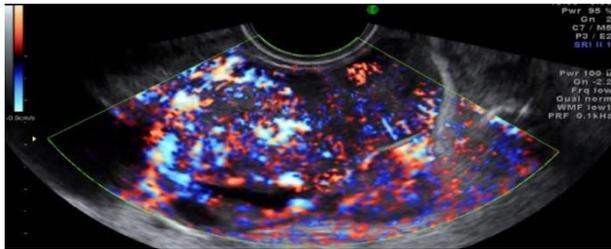
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Use of colour or power Doppler

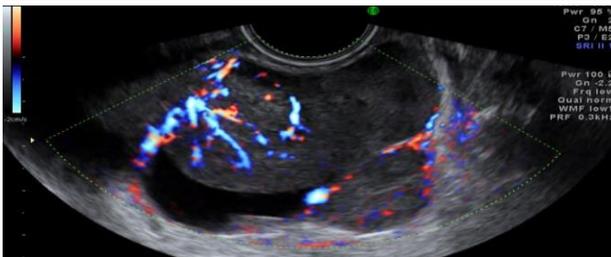


Use of Pulse Repetition Frequency (PRF)

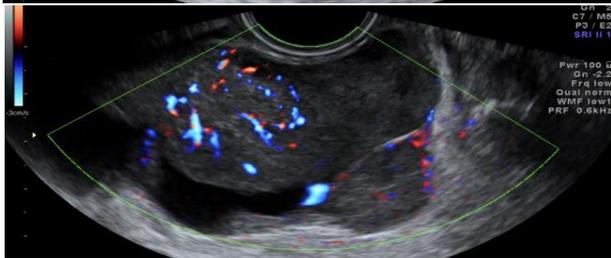
0.1



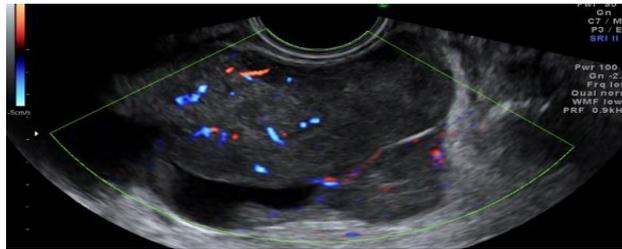
0.3



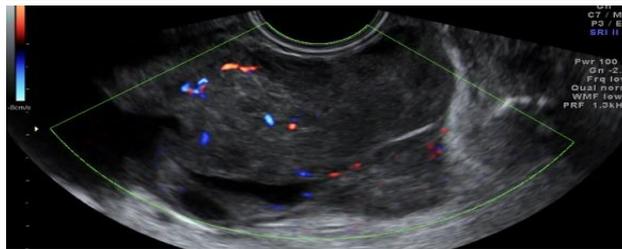
0.6



0.9



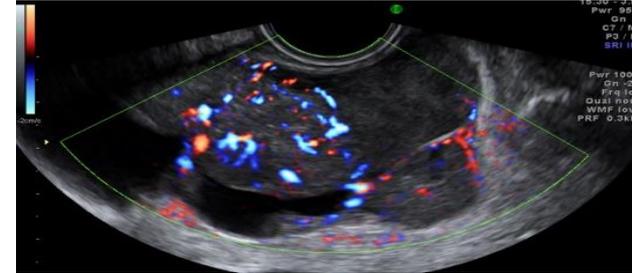
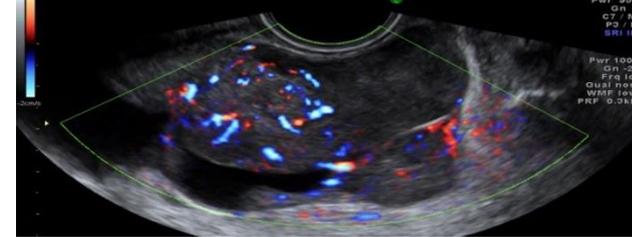
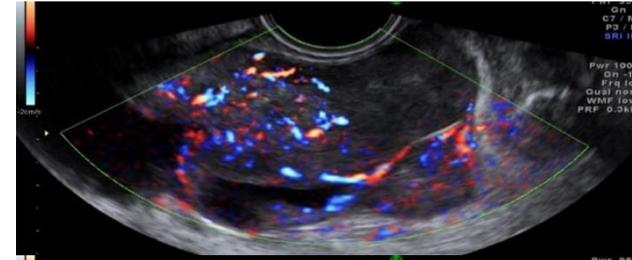
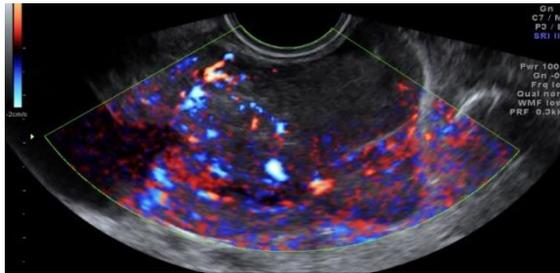
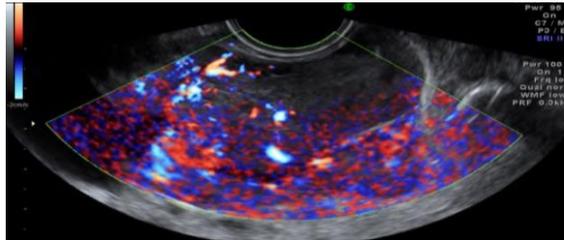
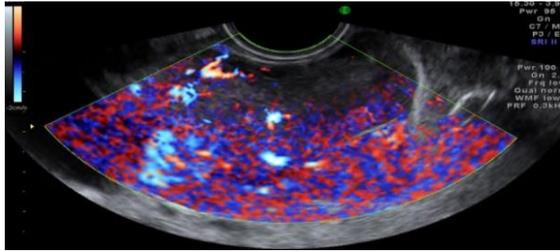
1.3



1.8



PRF fixed at 0.3, lower GAIN...



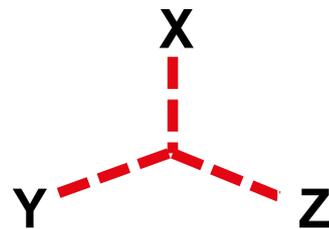
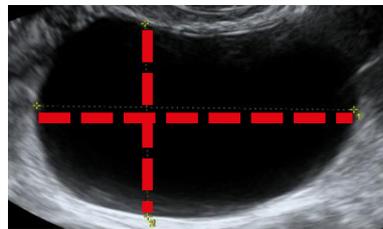
Ascites

- Fluid outside the pouch of Douglas



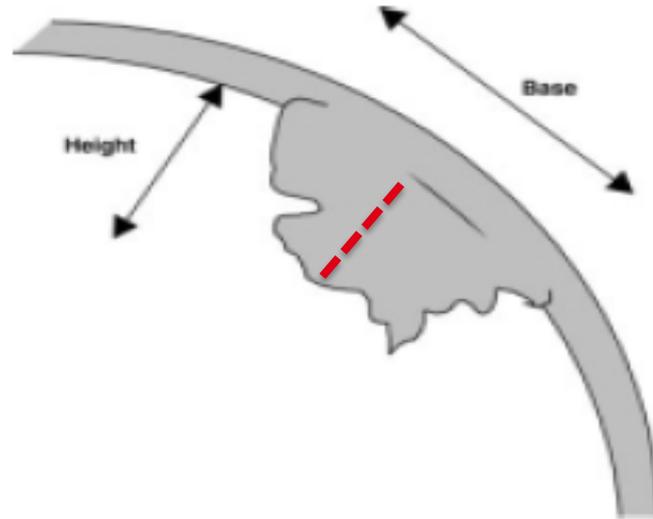
How to measure an ovary, a lesion or a solid component in a lesion

- Three orthogonal diameters
- Where the lesion/ ovary/ solid component appears to be at its largest
 - Maximum diameter
 - Mean diameter
 - Volume: $(L \times D \times W \times 0.5)$

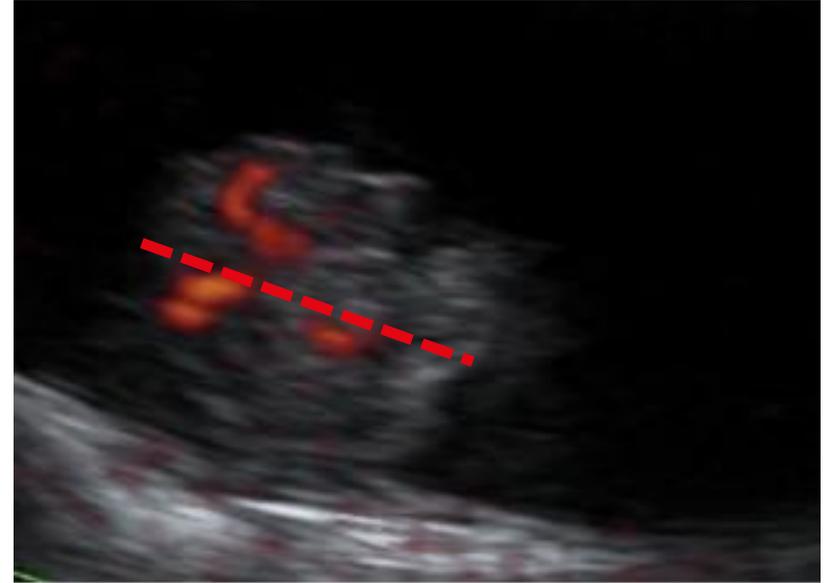
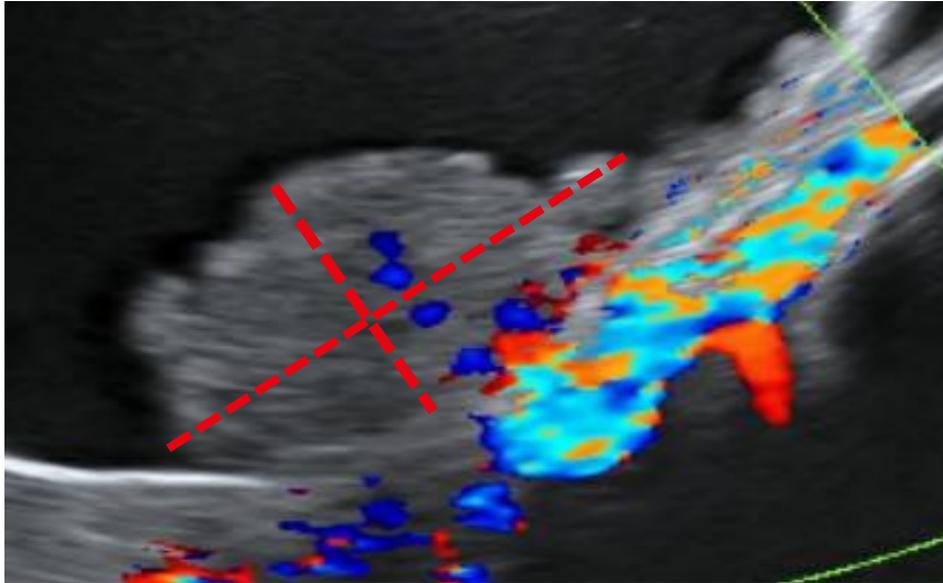


How to measure a papillary projection

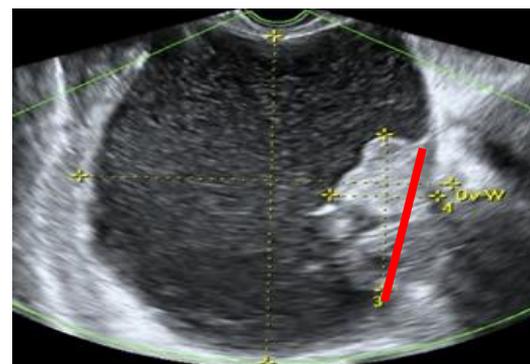
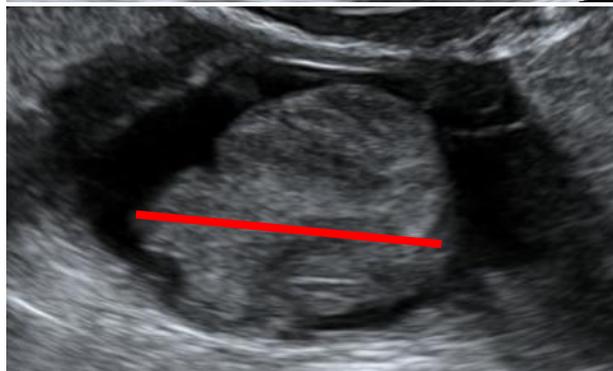
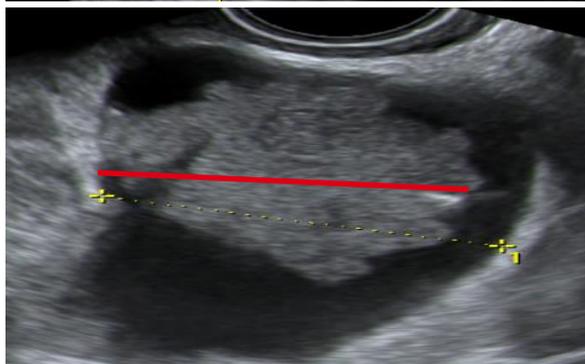
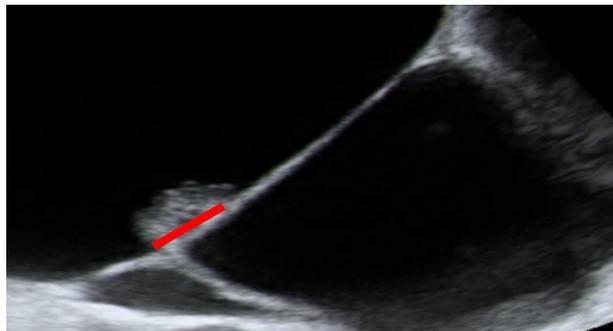
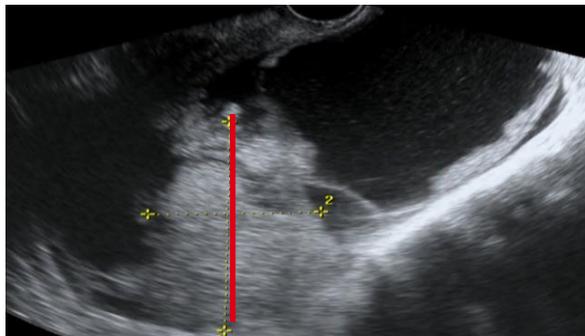
- All papillary projections are measured in two perpendicular planes: *height* and *base*



How to measure a papillary projection



Maximum diameter of largest solid component



Key points

- Using IOTA terms and definitions can help standardise the way we describe and classify masses
- There are 5 types of ovarian lesions: unilocular, unilocular-solid, multilocular, multilocular-solid, solid
- A solid component = structure that has (high) echogenicity suggestive of tissue
- A papillary projection is a solid component attached to the ovarian cyst wall that measures $\geq 3\text{mm}$ ($< 3\text{mm}$ is a cyst wall irregularity)
- The PRF must be adjusted to 0.3-0.6 KHz (3-6 cm/s) when assessing vascularity with Doppler



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