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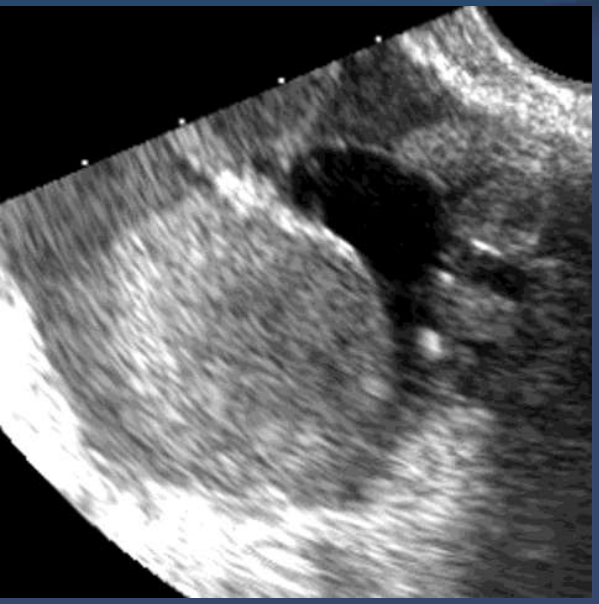
OHSU

Ultrasound of the Adnexa

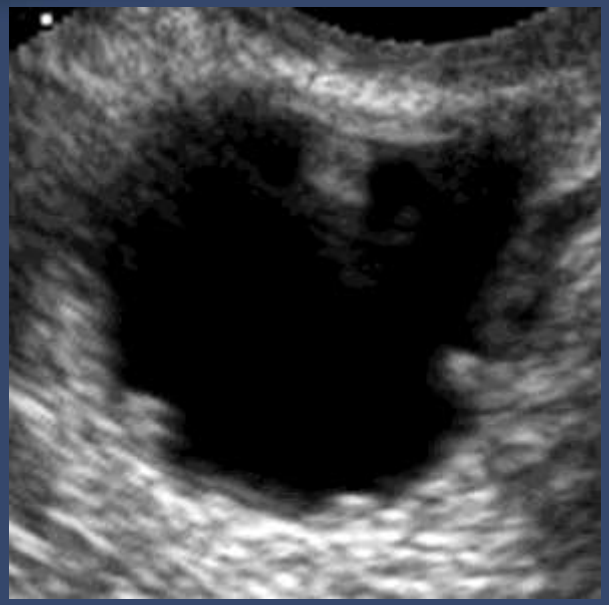
Non-Ovarian Pathology (mostly)

Presented by: Roya Sohaey MD, Professor, Diagnostic Radiology

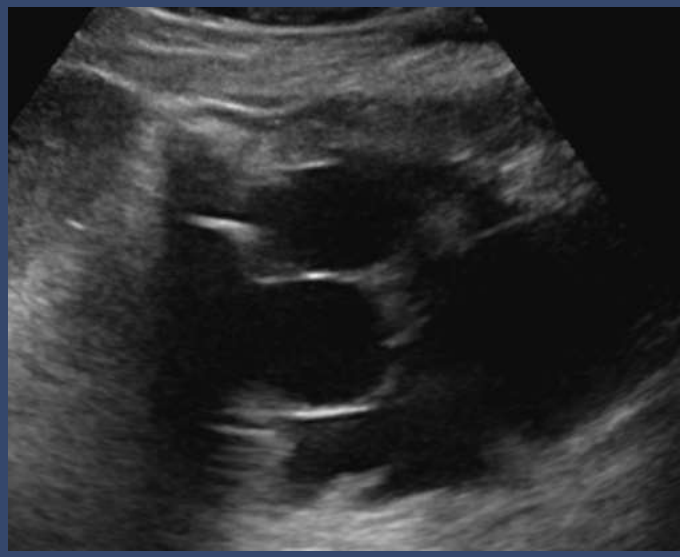
The main problem with adnexal lesions on ultrasound



Pyosalpinx



Hydrosalpinx



PIC

Can mimic SCARY ovarian masses

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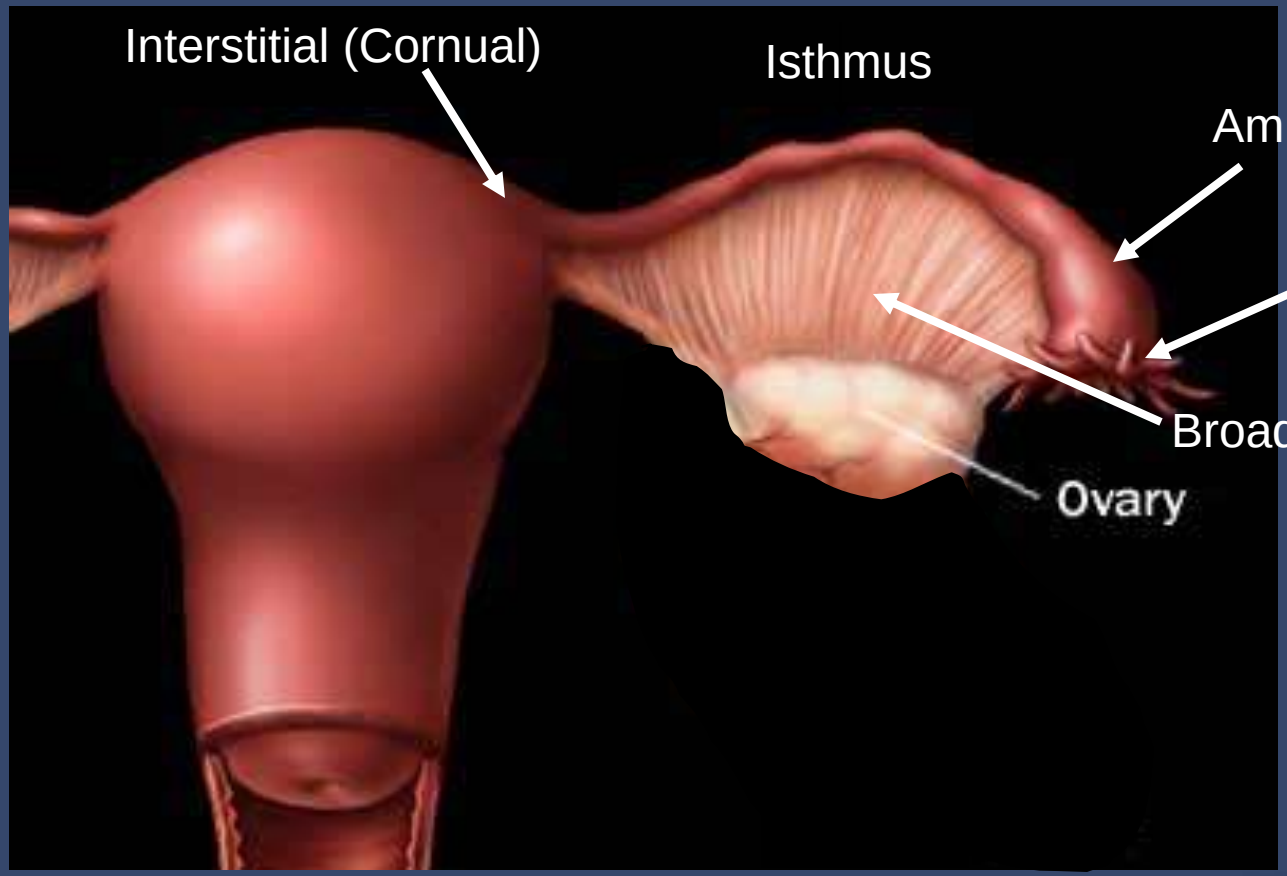
Adnexa Anatomy



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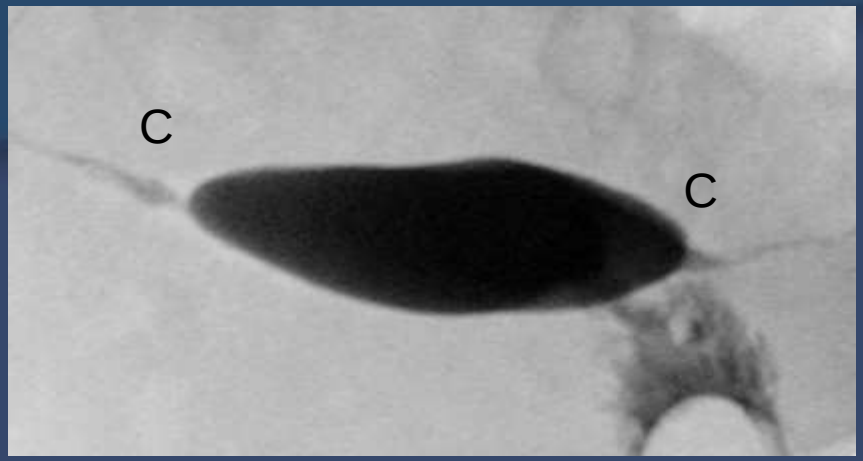
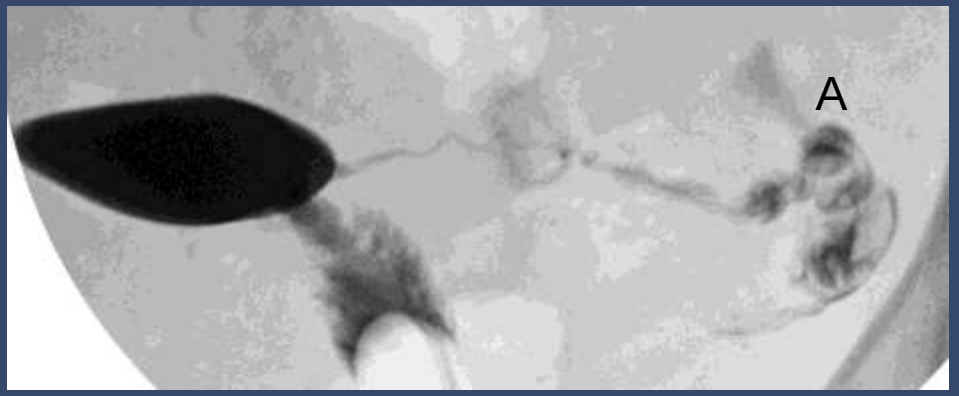
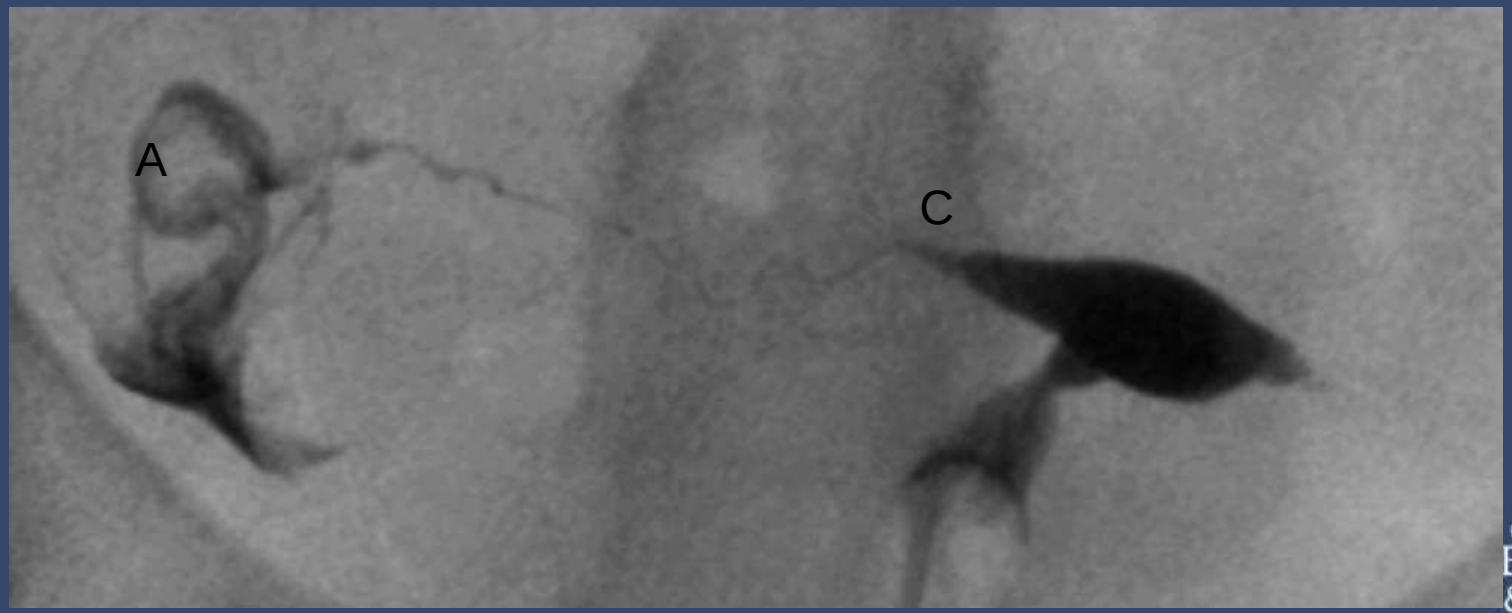
Normal HSG







Approach to the Pelvic US

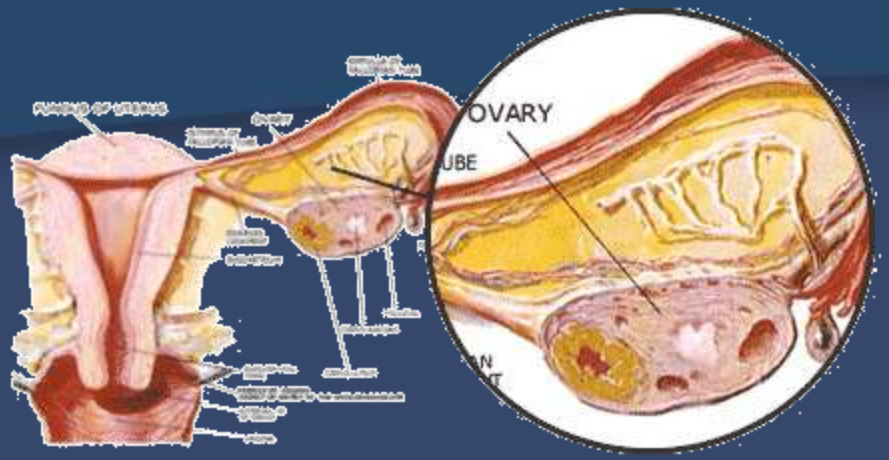
BASIC Imaging

- Uterus
  - Long
  - Axial
- Ovaries
  - Long
  - axial
- Cul-De-Sac

FURTHER Imaging

- Uterus
  - 3D coronal
  - Sonohysterography
- Think “Adnexa” not “ovary”
  - If you see a finding, look for the ovaries anyway
  - Oblique views
  - 3D, doppler
  - Bowel evaluation

Acute Adnexal Pain



- Acute Adnexal Pain
  - Pregnant
    - Rule out ectopic
  - Not Pregnant
    - Ovarian cause: Functional cysts
    - Non-ovarian (tube, GI, GU) US-CT-MR

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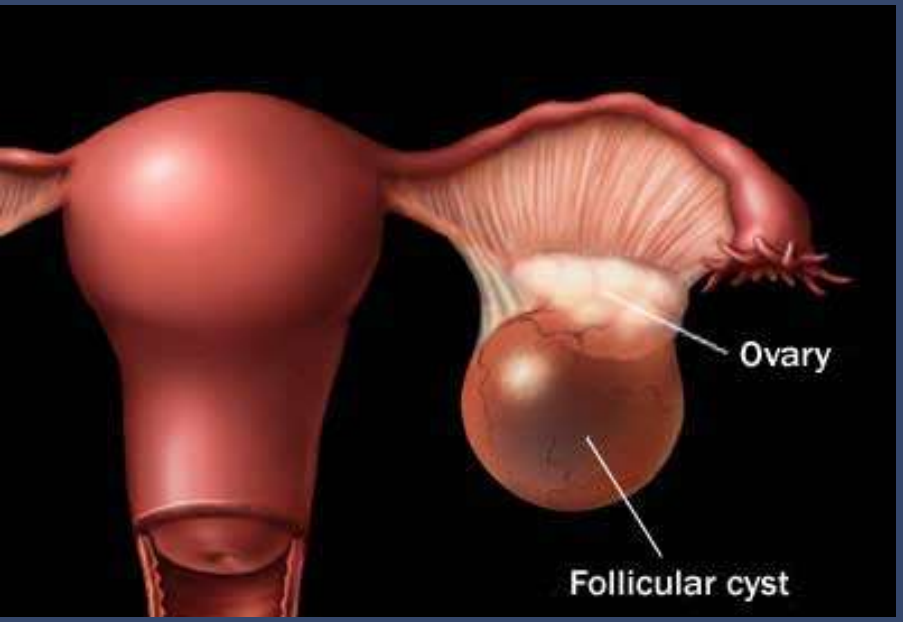
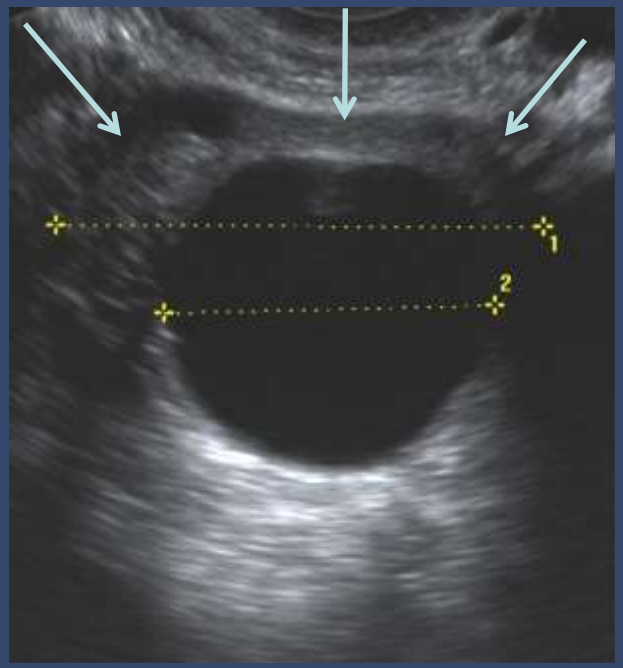
Ovarian lesions associated with pain

- Functional cysts
- Teratoma with complication
- Endometriosis…an intro to the adnexa

Functional Ovarian Cysts: Look for ovarian rim

- Associated with cyclic ovarian function
- Unilocular or Complex
- Most Common:
  - Simple epithelial cysts/ follicular cysts
  - *Large CL or CL cyst*
  - *Hemorrhagic cyst*





- Unilocular cyst
- Associated with anovulation
- Often < 6 cm

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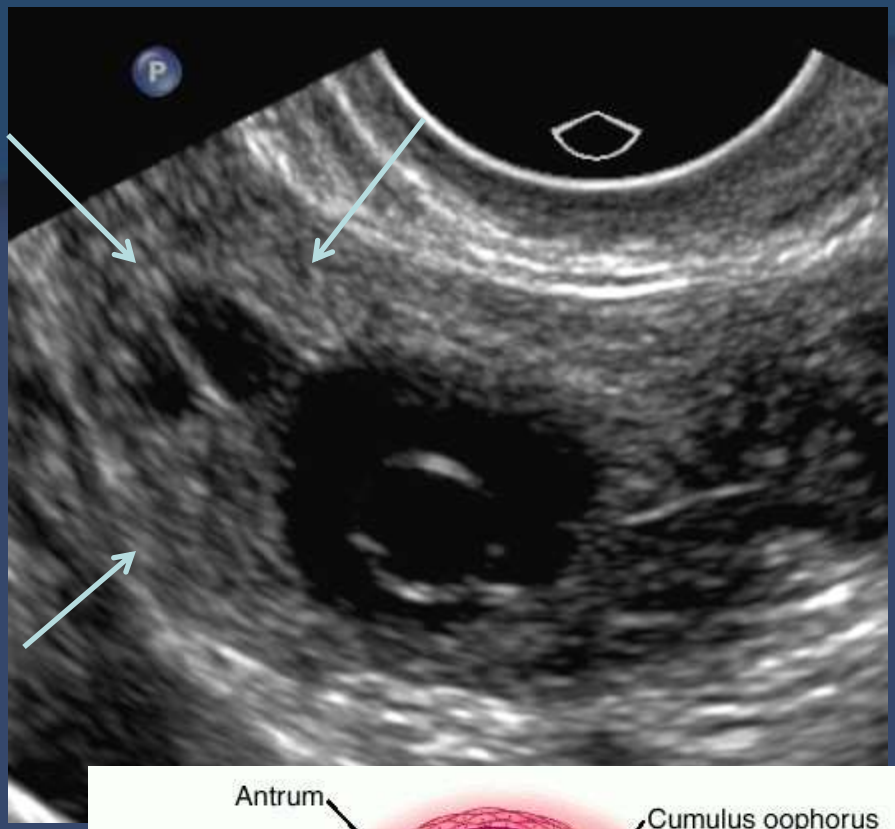
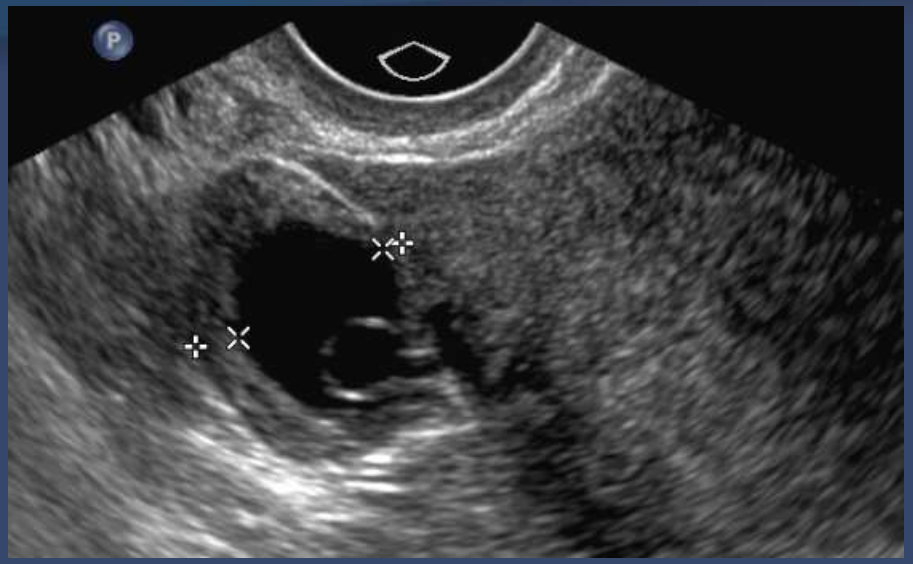
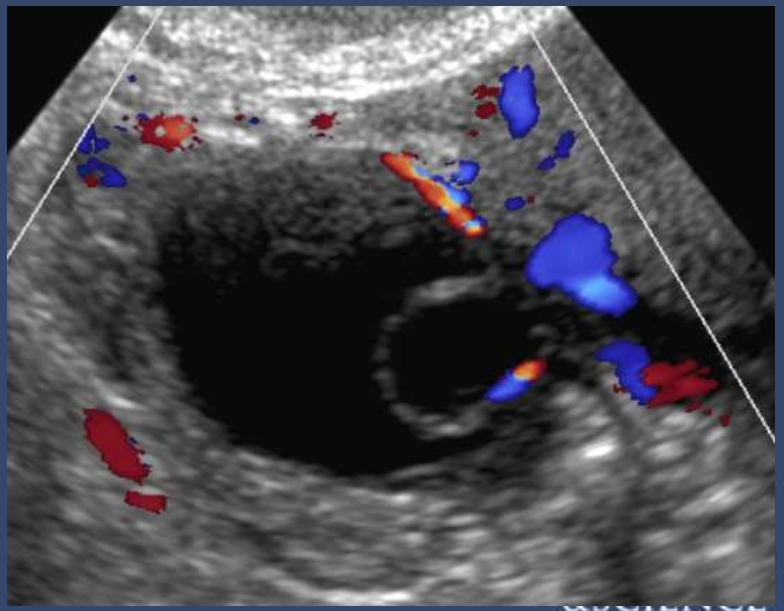
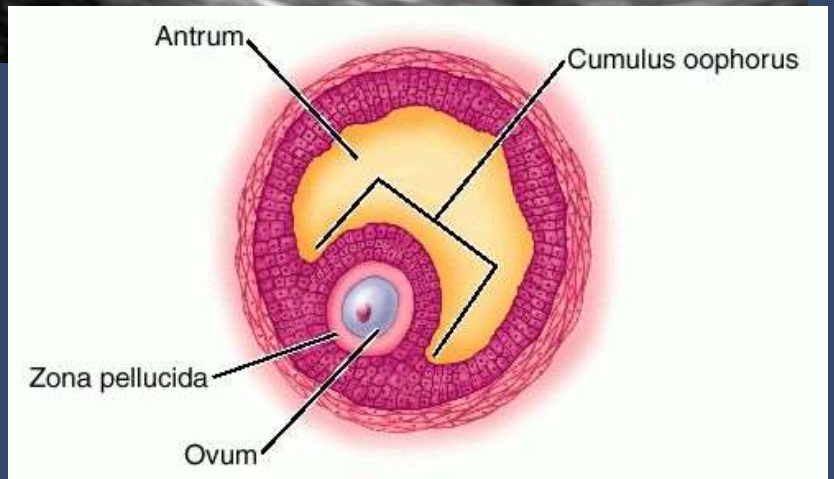
Functional Cyst: Cumulus Oophorus

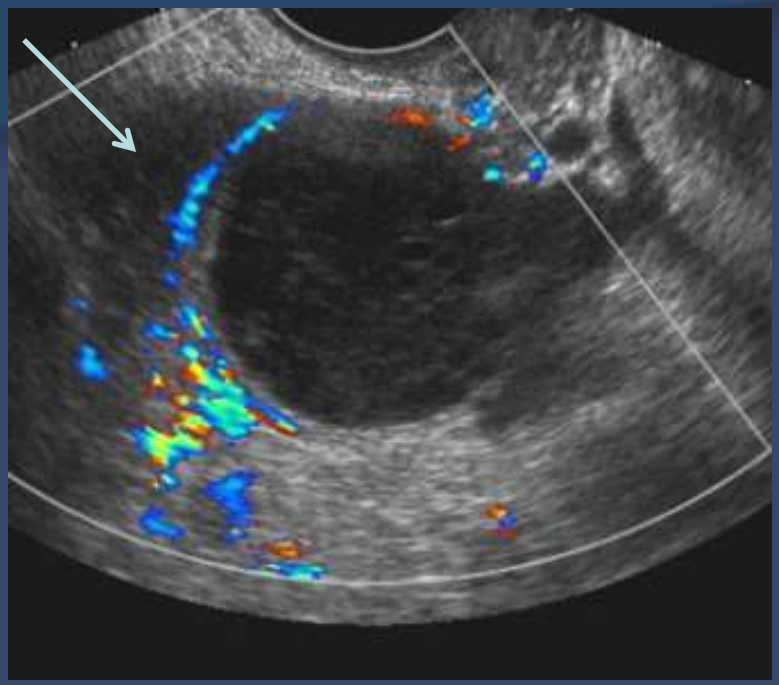


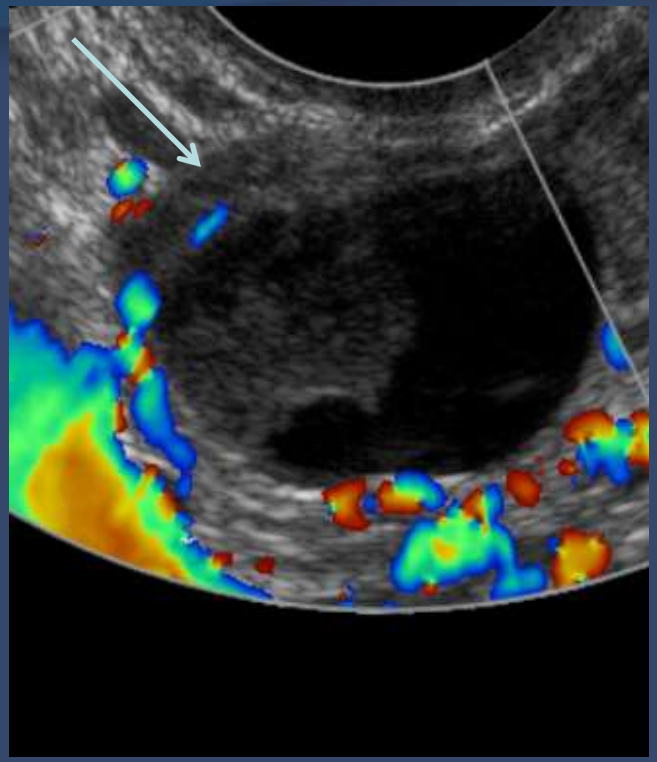


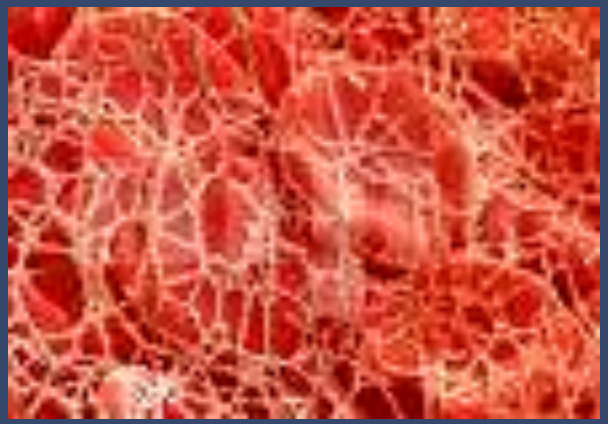




Functional cyst: Hemorrhagic Cyst







- Cyst with internal linear echoes
  - FIRST: Lace like/reticular fibrin strands (NOT septations)
  - NEXT: Retracting blood clot
- Most are CL with hemorrhage
  - Peripheral flow only

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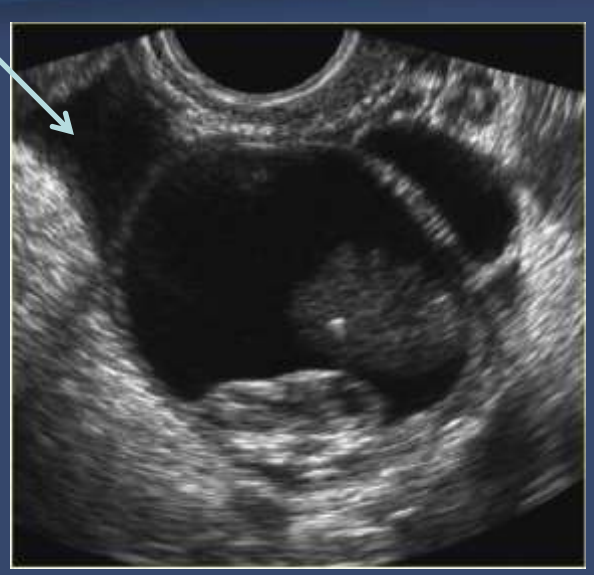
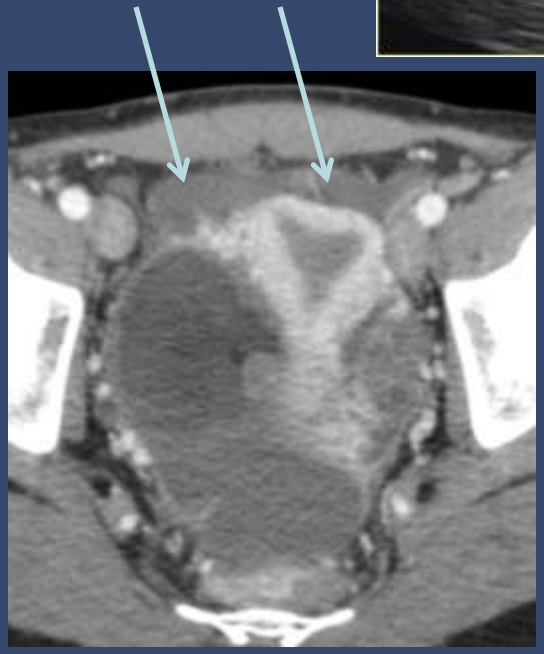
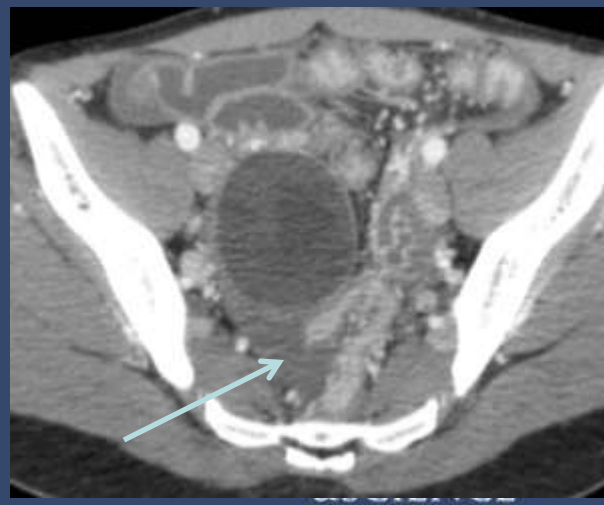
Teratoma: acute pain if torsion or rupture

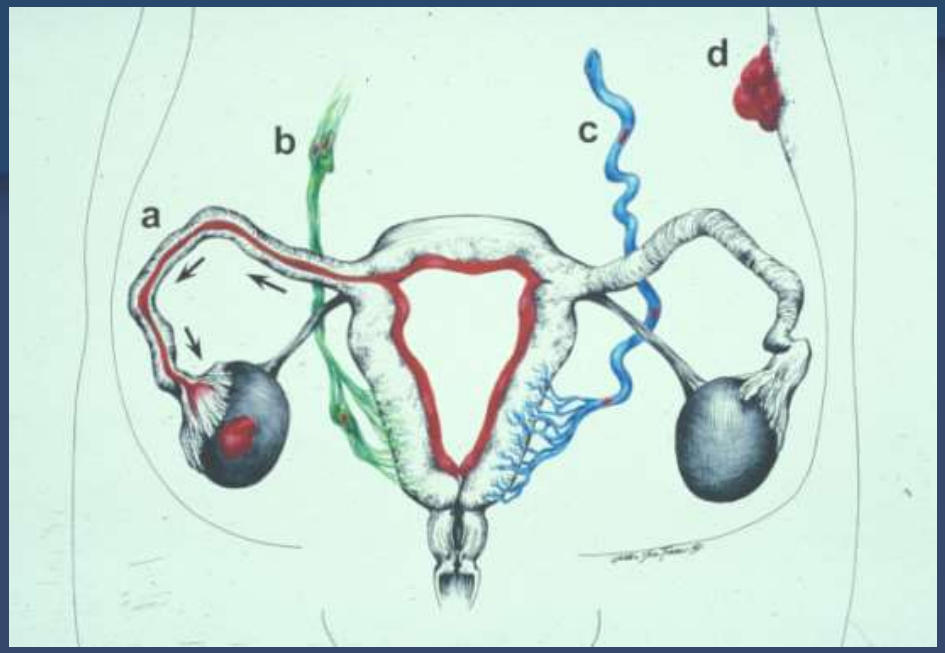
- 3 germ layers
- Variable features
  - lose ovarian rim
  - Solid areas (look for fat/calcifications)
  - Complex cystic
  - Dermoid plug
- Bilateral in 20 %

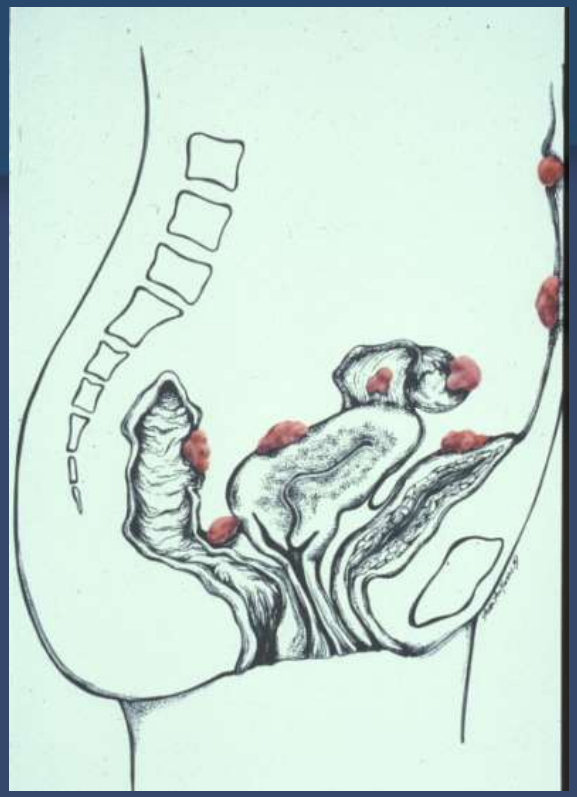






Endometriosis





- Definition
  - Functioning ectopic endometrial tissue
  - Premenopausal disorder
- Cyclical pain
  - Can present with acute pain

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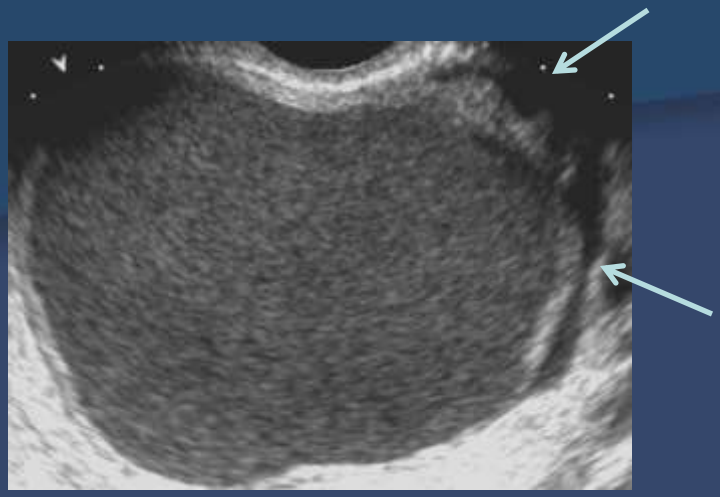
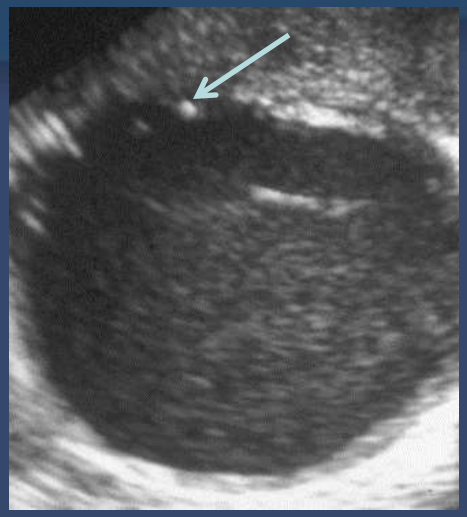
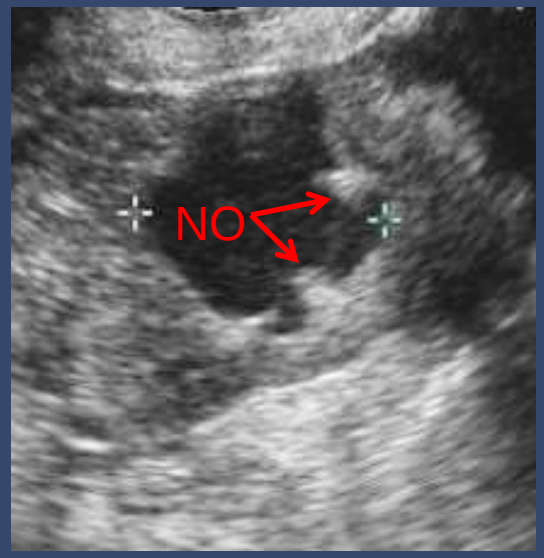
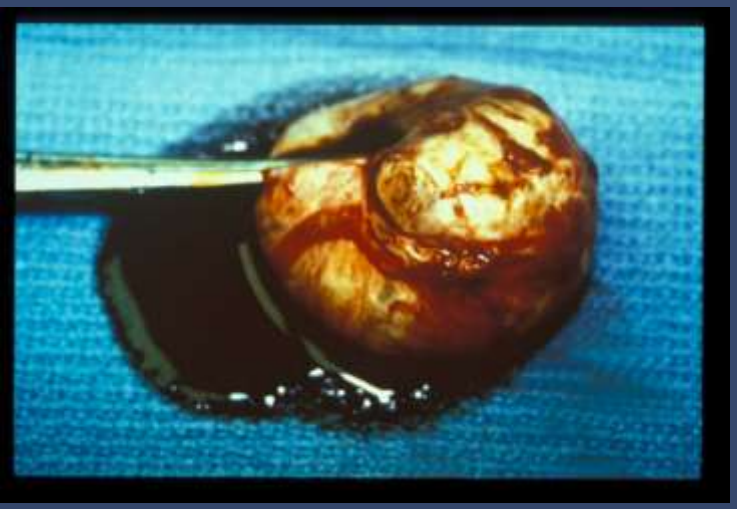
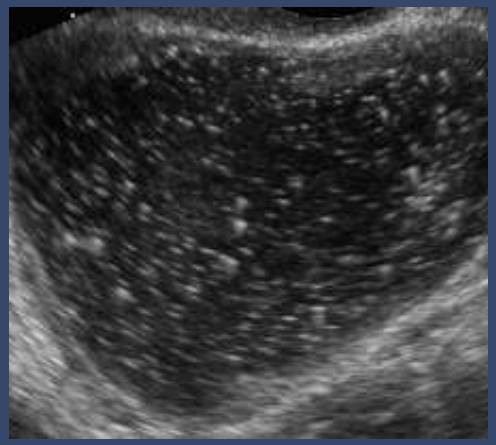
Endometrioma:Chocolate Cyst











Classic Ultrasound Appearance

- Diffuse low/medium level echoes
- Variable wall thickness
  - tiny echogenicities with comet tail artifact (cholesterol deposits)

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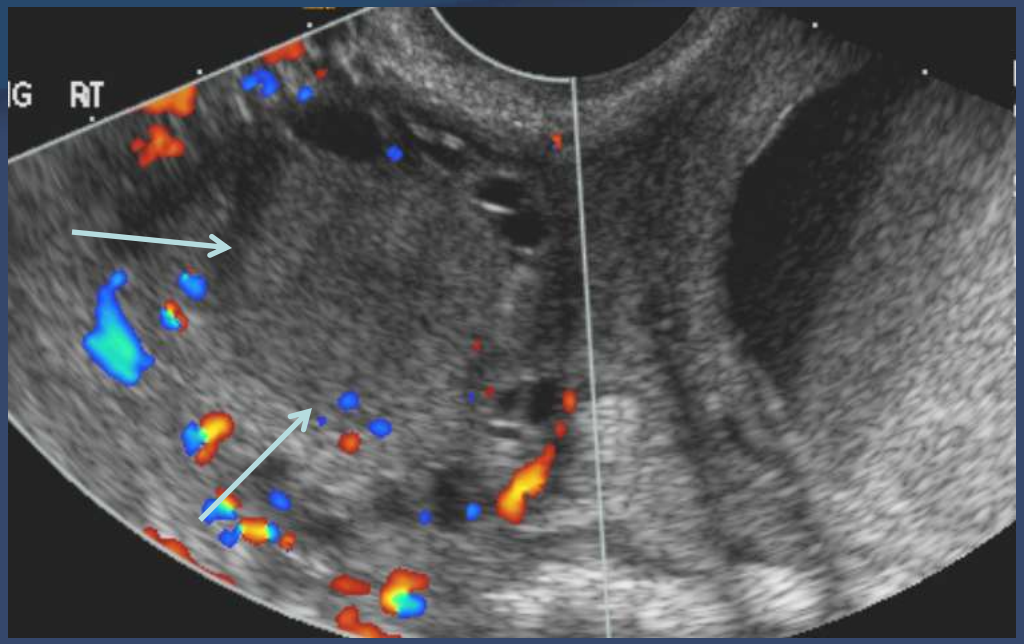
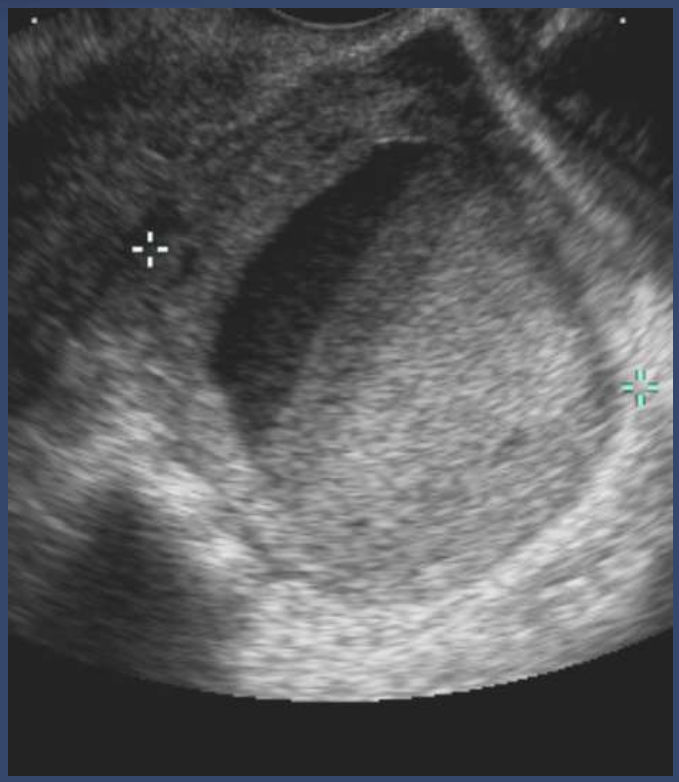
Case from ED: Rule out Torsion





Ovarian endometrioma (not reason for pain)
Adnexal Endometrioma with hemorrhage
Evidence: Fluid/Fluid level
DDX: TOA

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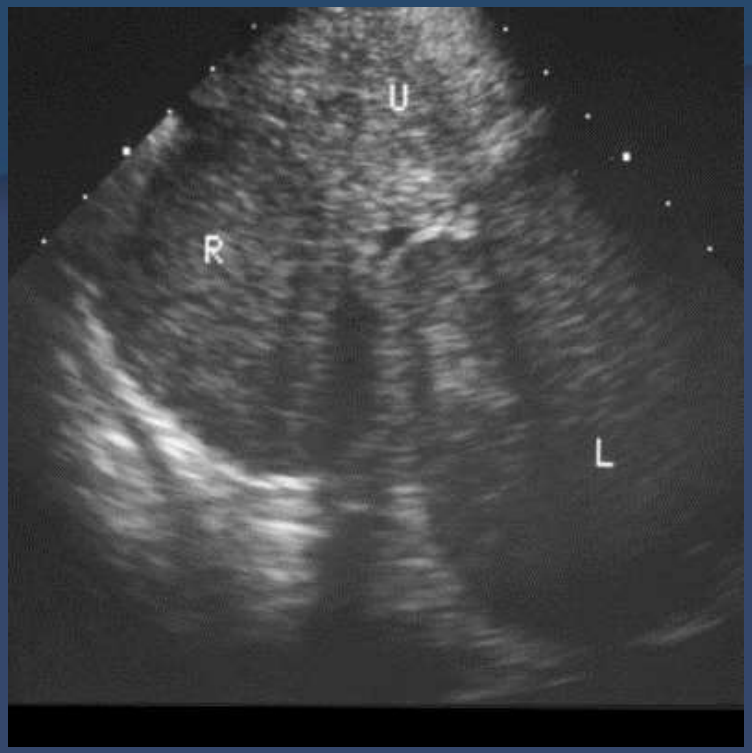
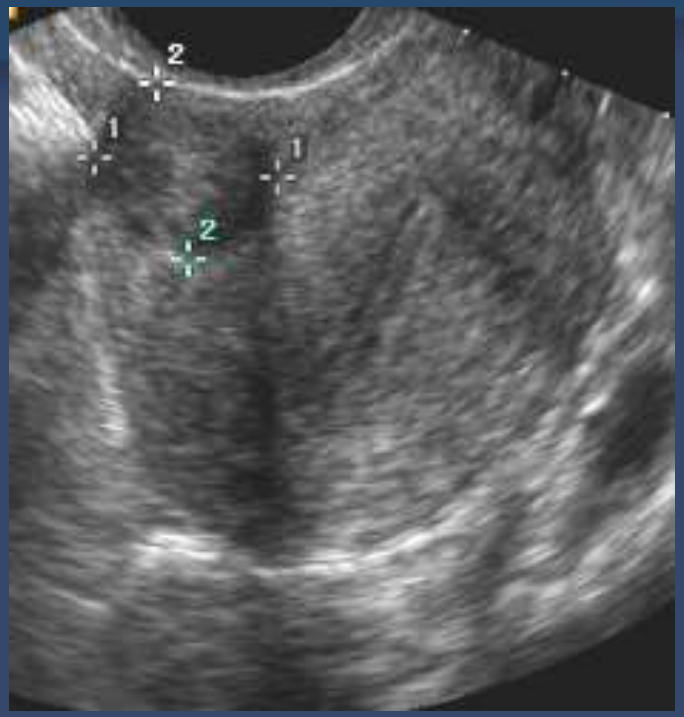
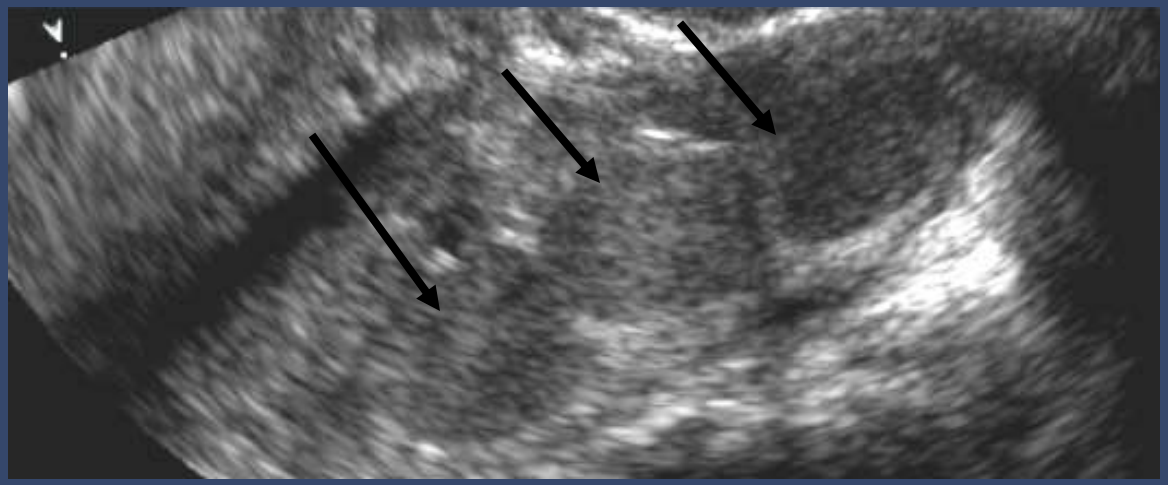
Endometriosis: Multiple sites







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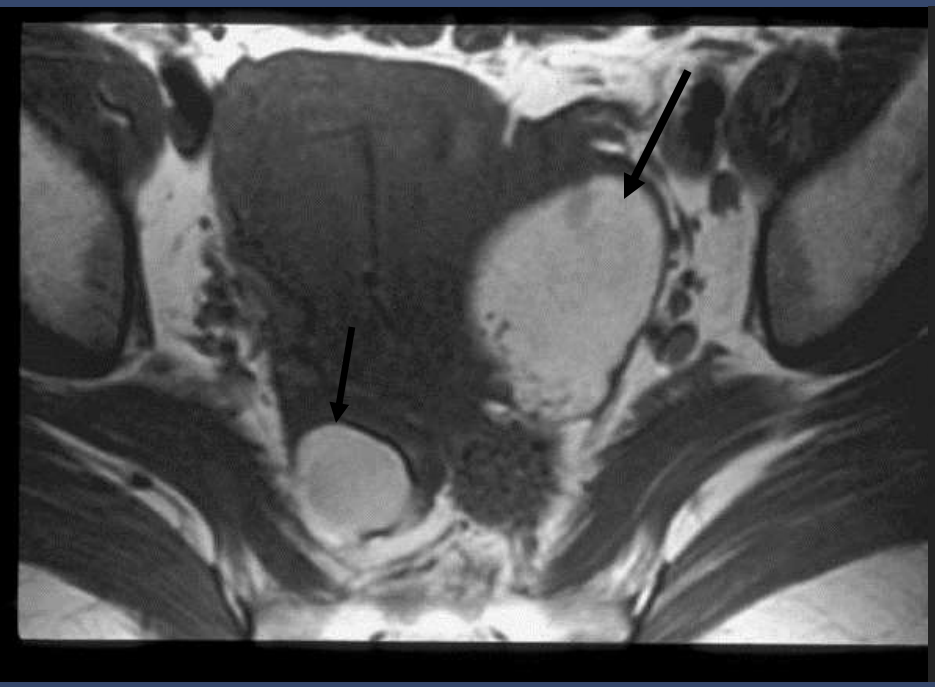
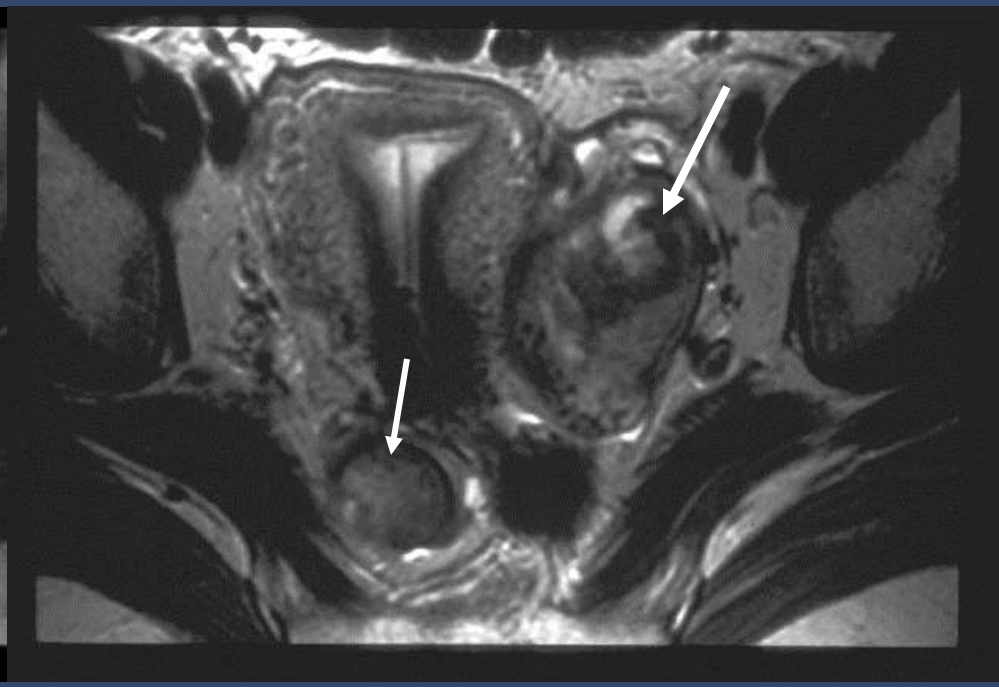
Endometriosis: T2 shading

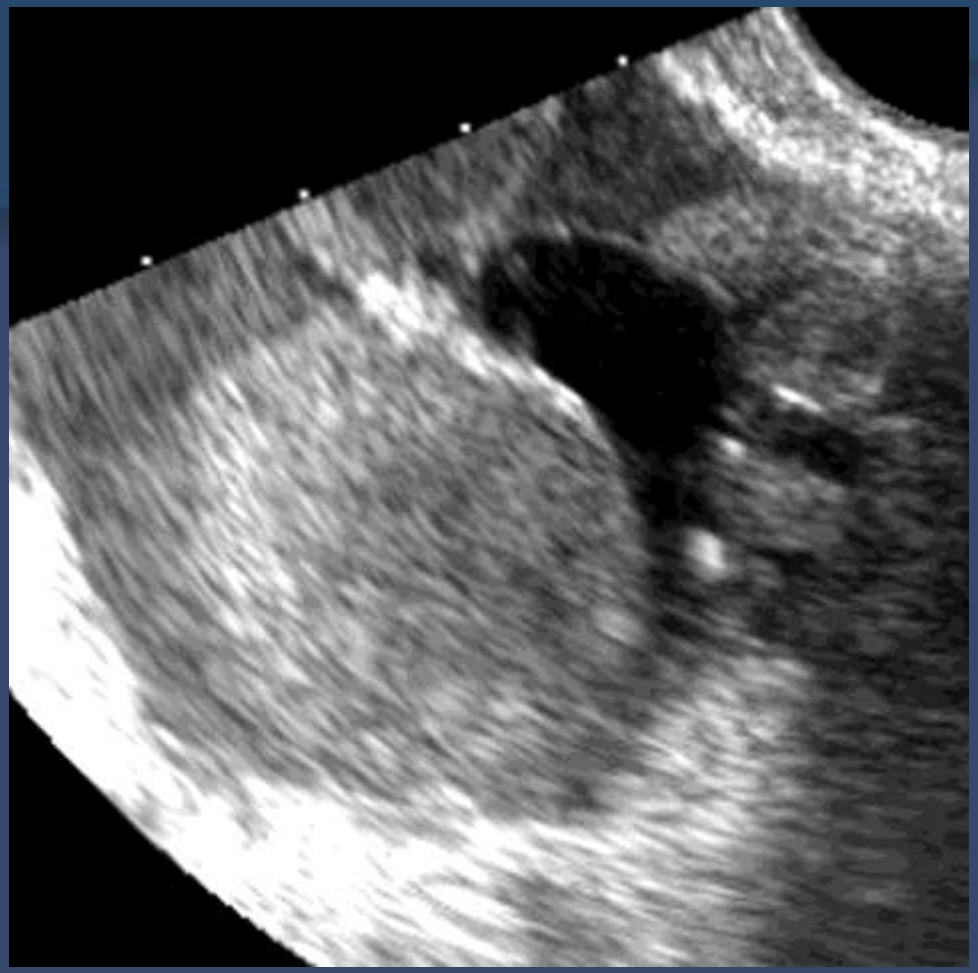


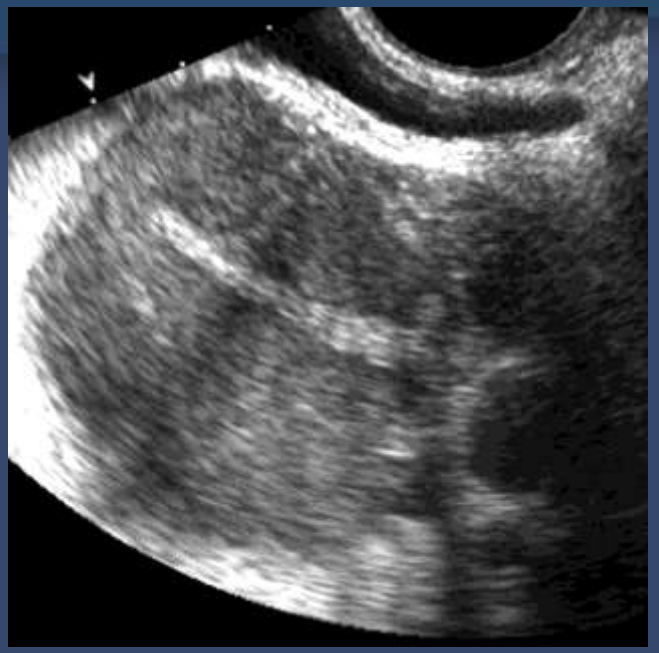
T1

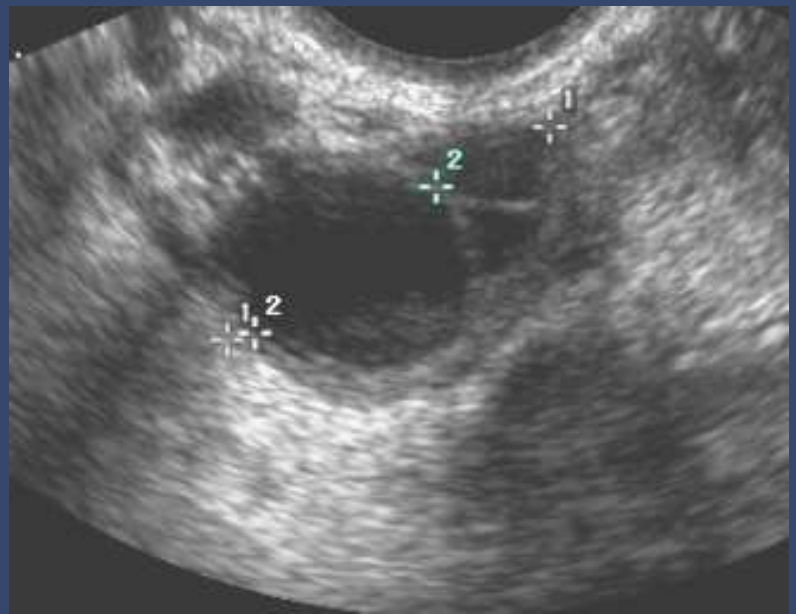


T2

Case: Adnexal Pain from ED, labs pending







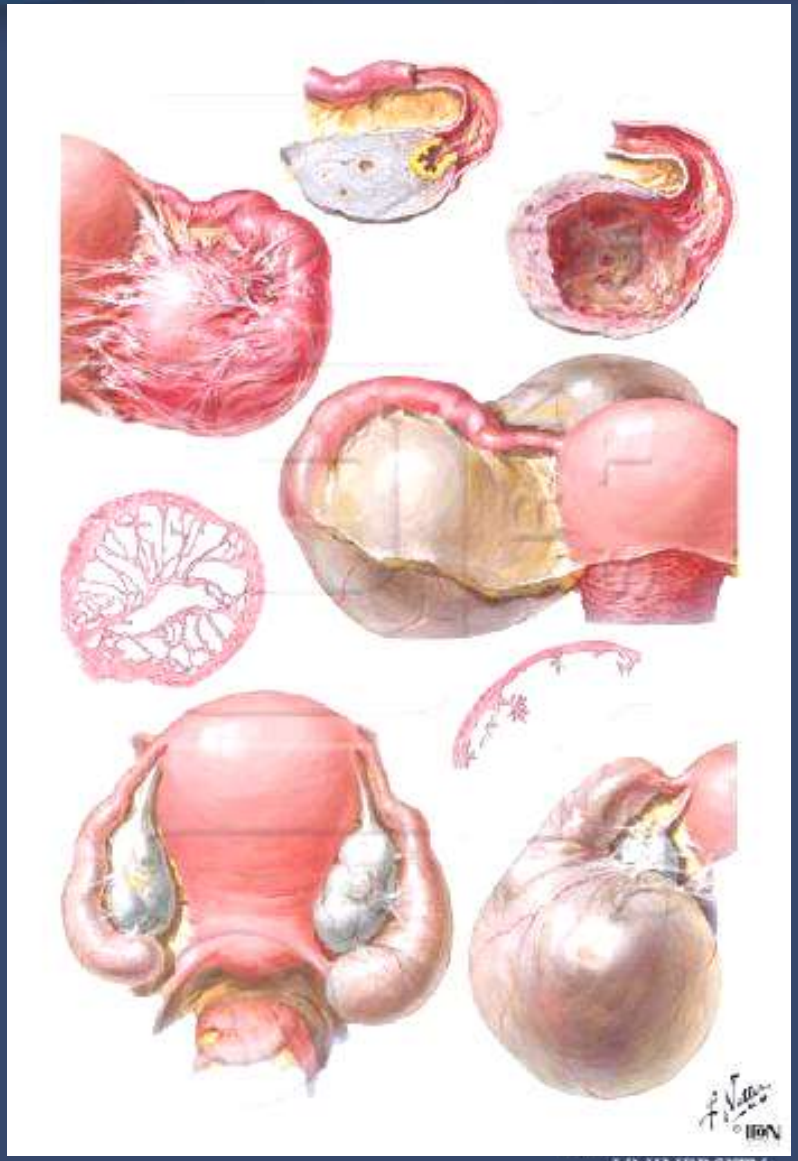
PID: Pyosalpinx

Differentiating ovary from tube

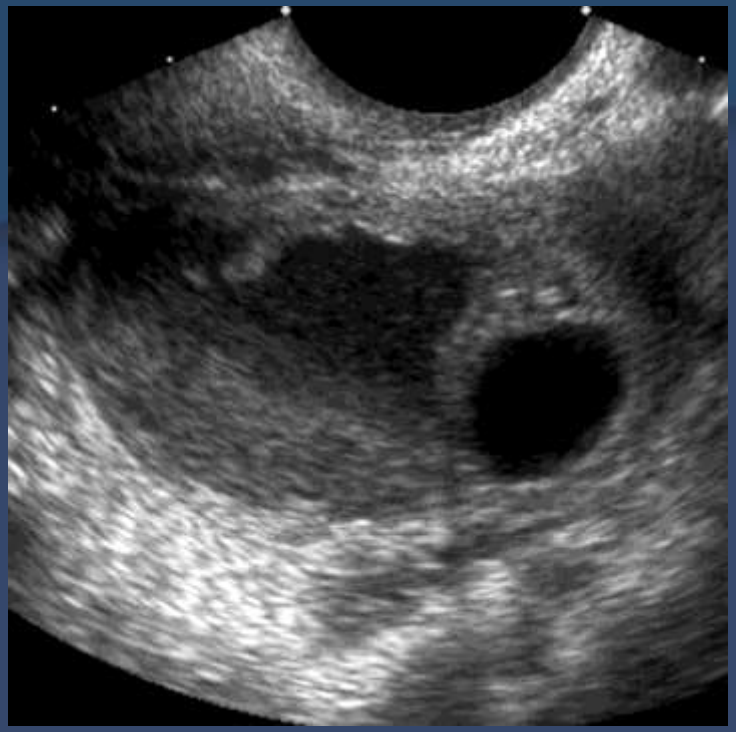
- Use probe to move structures away from each other, use hand on abdomen
- When you see an adnexal mass don't assume it's the ovary…look for the ovary anyway. Often displaced by tubal mass.
- Unravel the tube
- Think of the clinical scenario
- Use MR as a problem solver

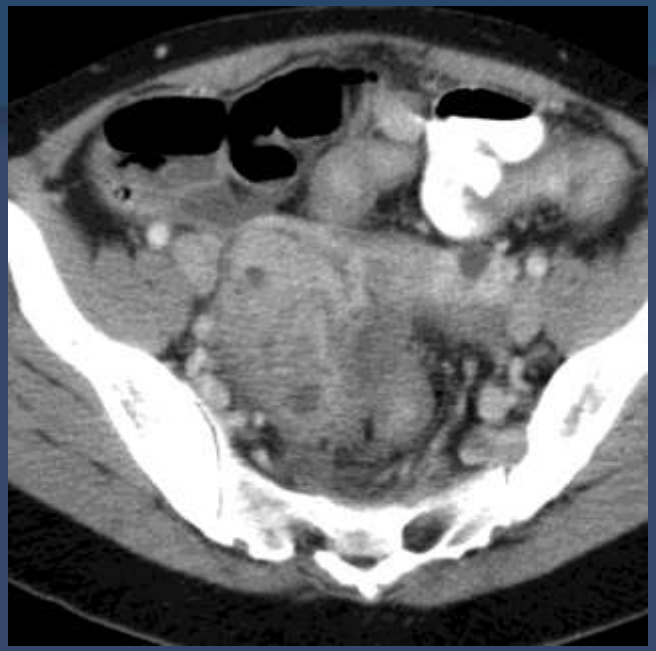
Pelvic Inflammatory Disease

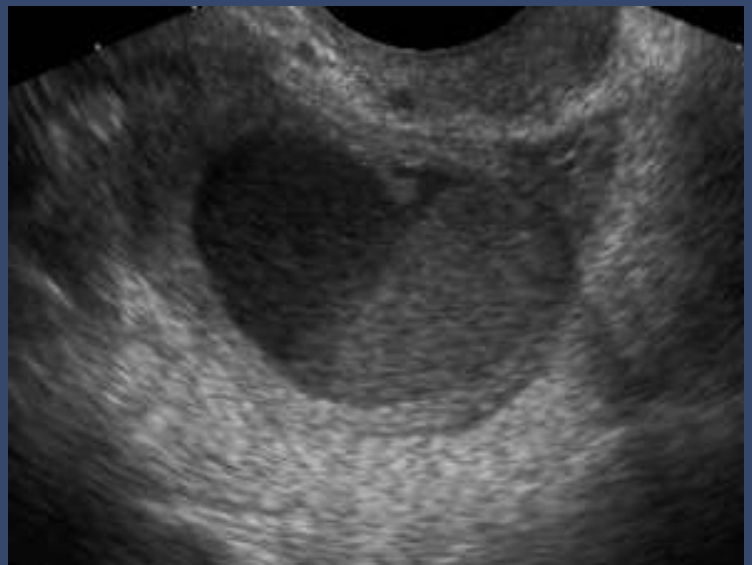
- Definition
  - Upper genital tract infection (STD)
  - Chlamydia (most common)
- Epidemiology
  - 780,000 new cases of acute PID/year in USA
- Long Term Sequelae : Infertility
  - Tube scarring
  - Hydrosalpinx
  - Salpingitis isthmica nodosum (SIN)

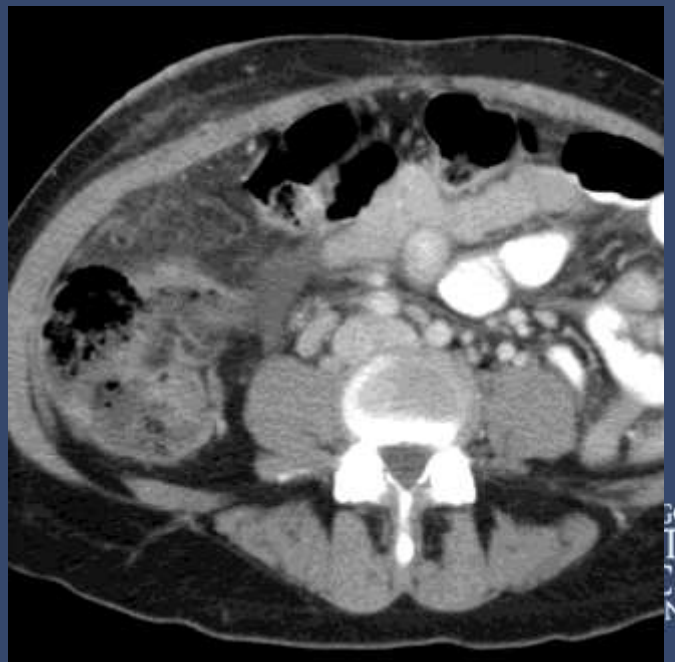


PID:Tubo-ovarian Abcess



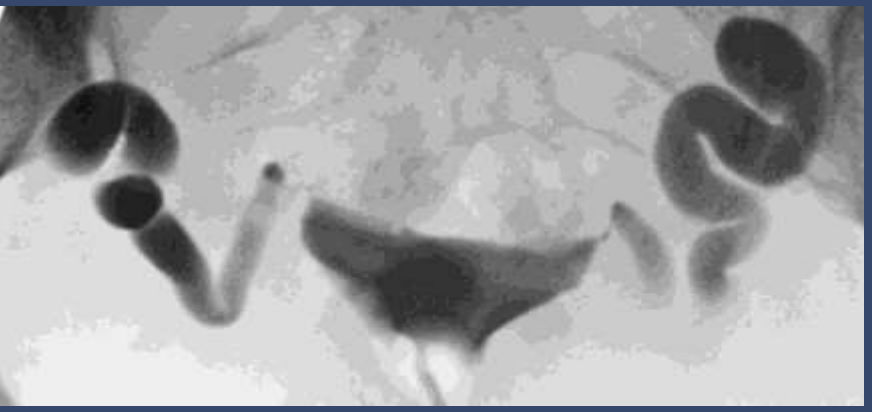


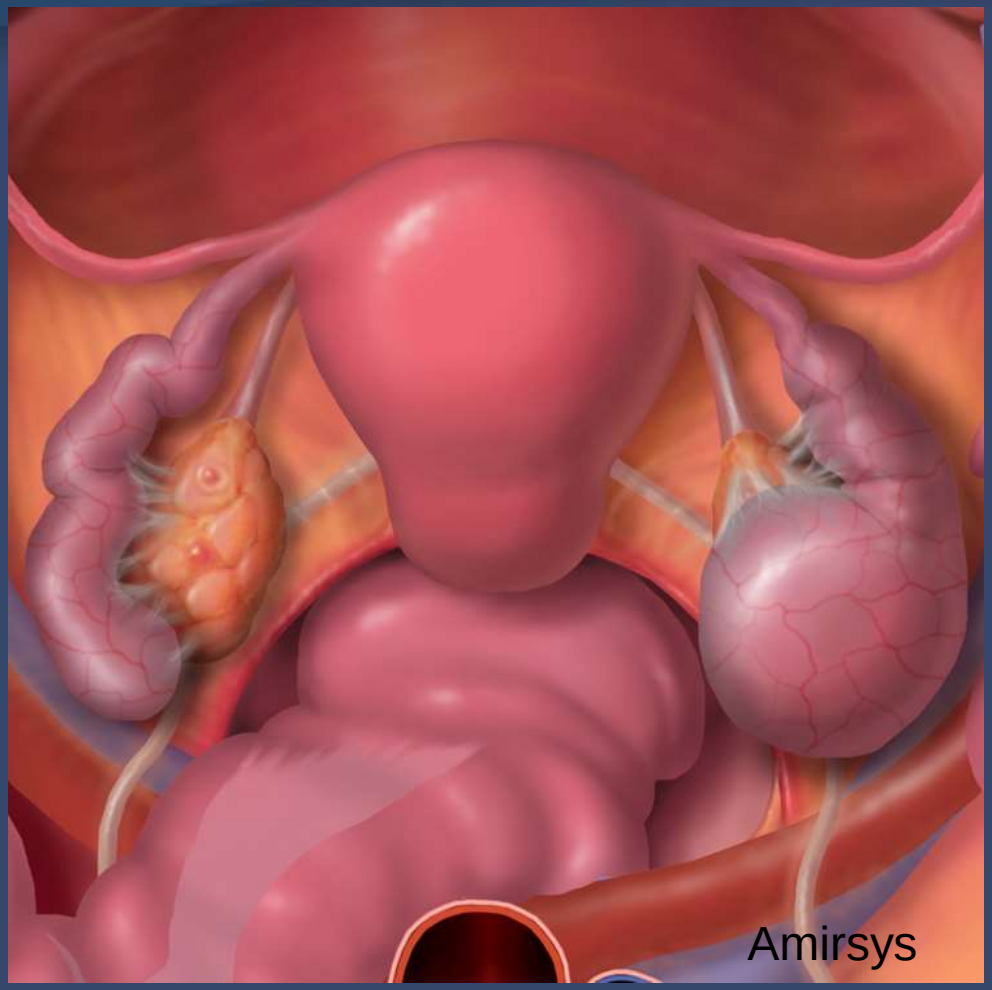




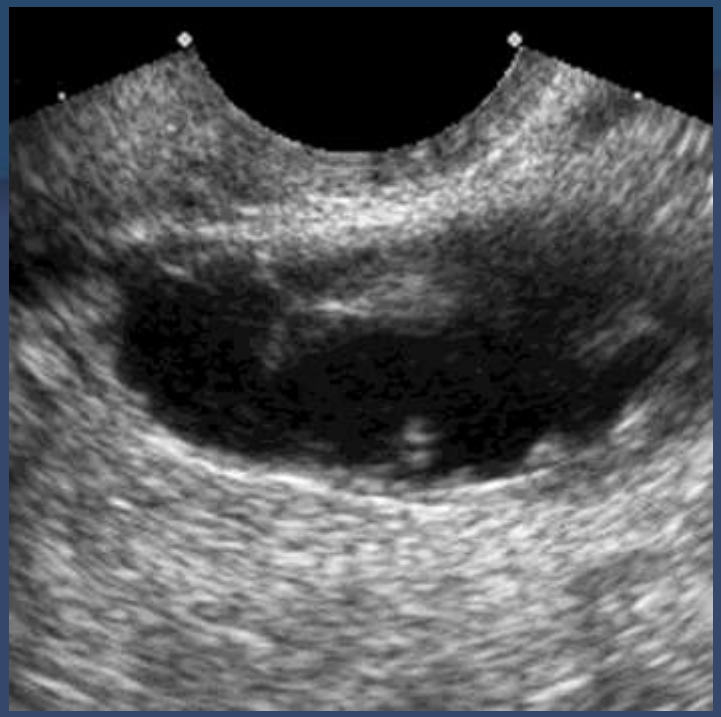
Long term sequelae of PID: Hydrosalpinx

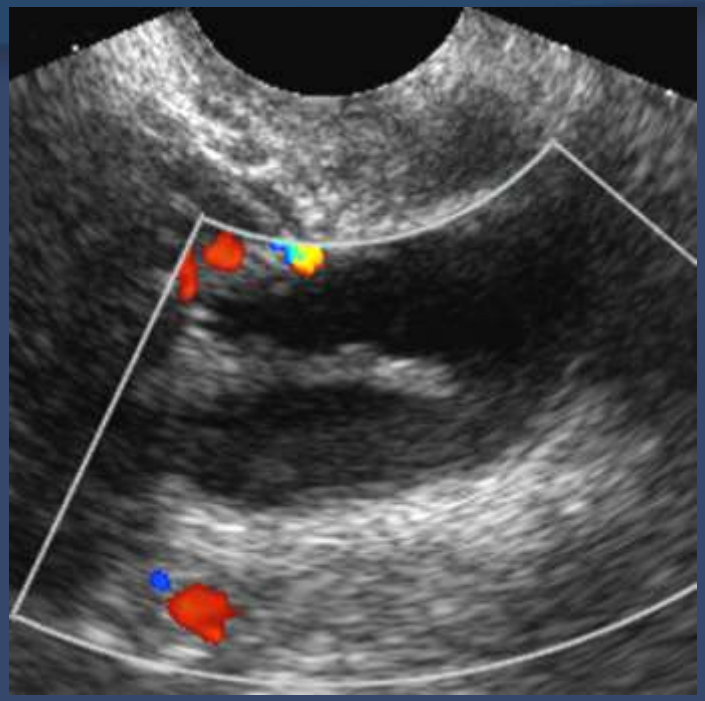
- Obstruction
- Tubal distention
- Scarring

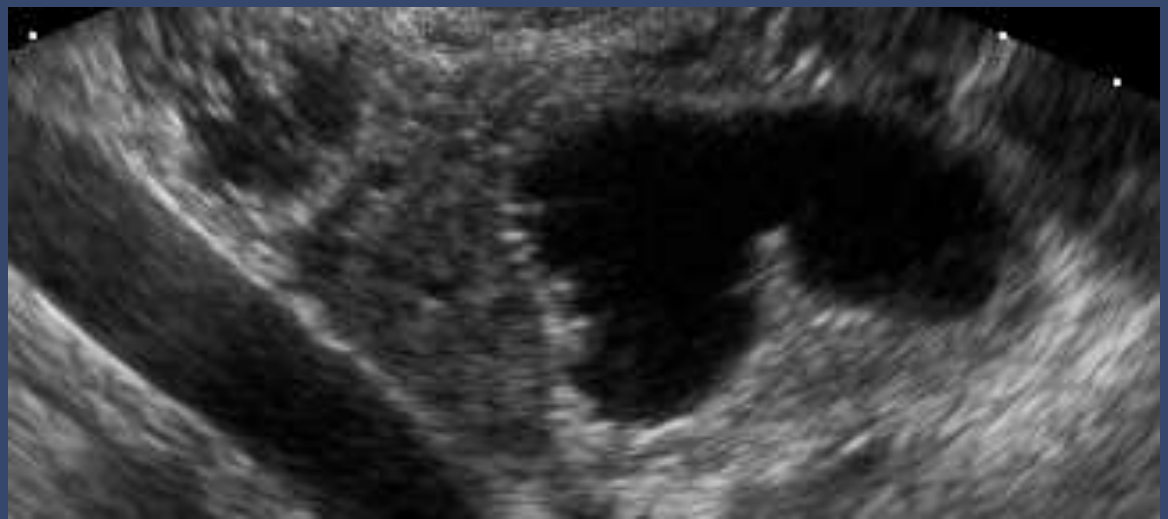




Incidental finding: Hydrosalpinx







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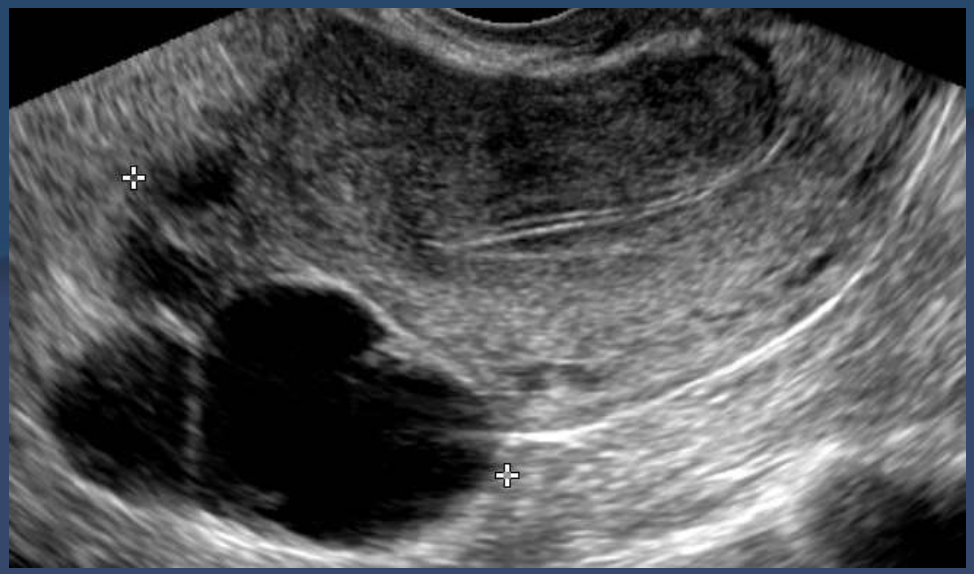
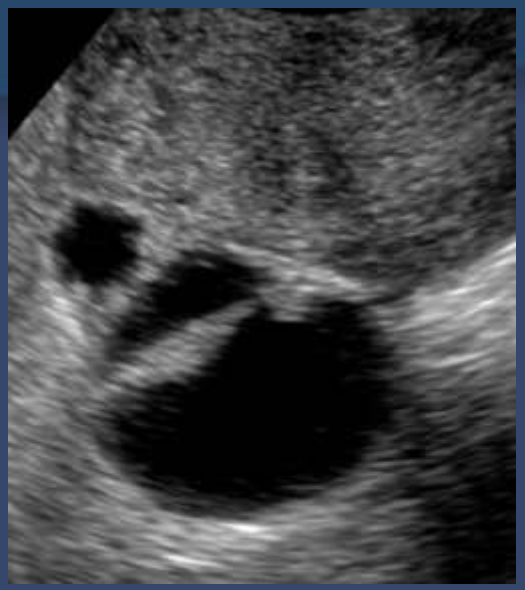
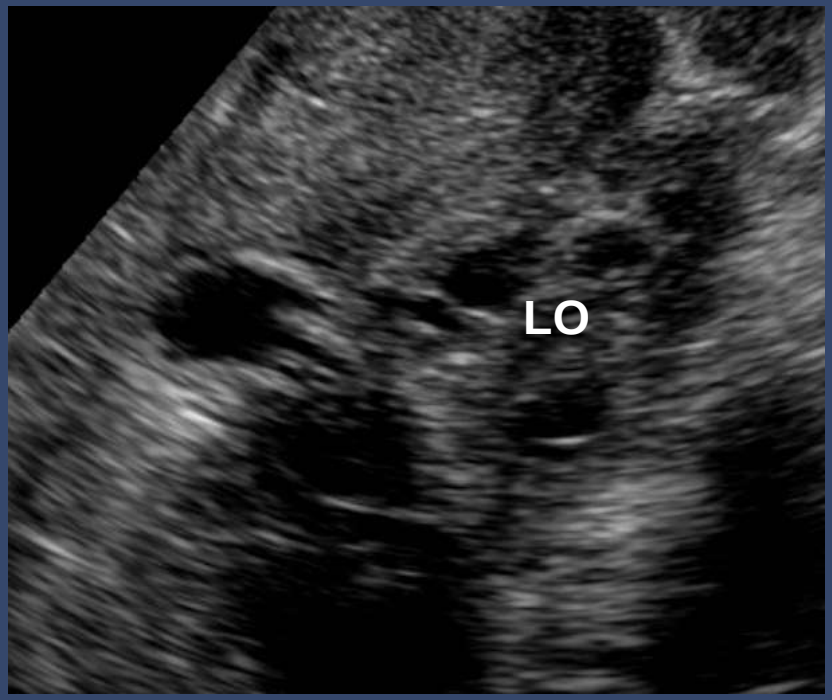
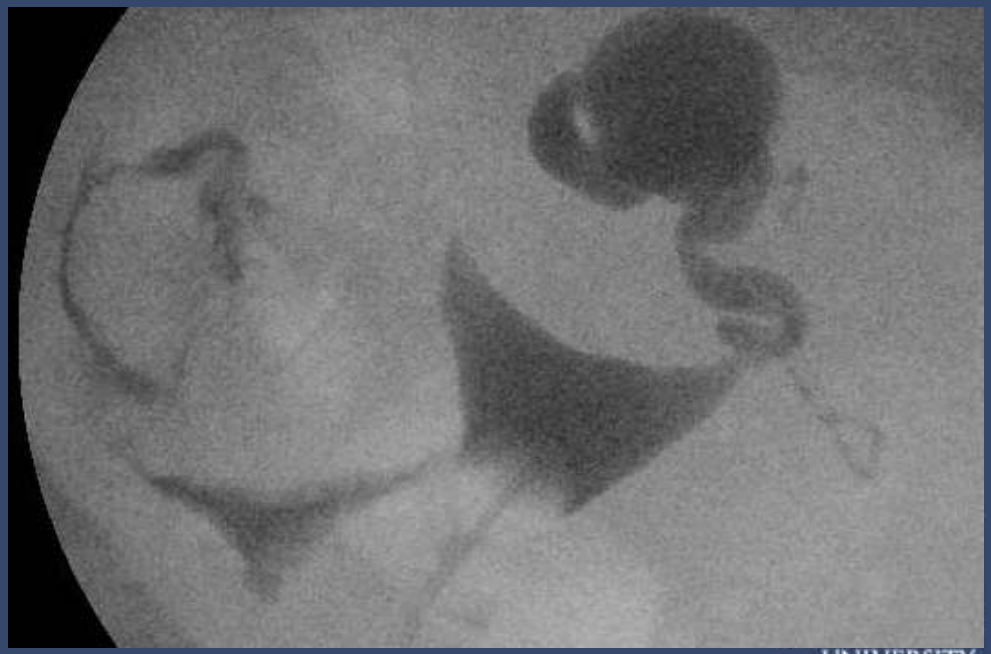
Referral for ovarian cancer: FinalDX Hydrosalpinx

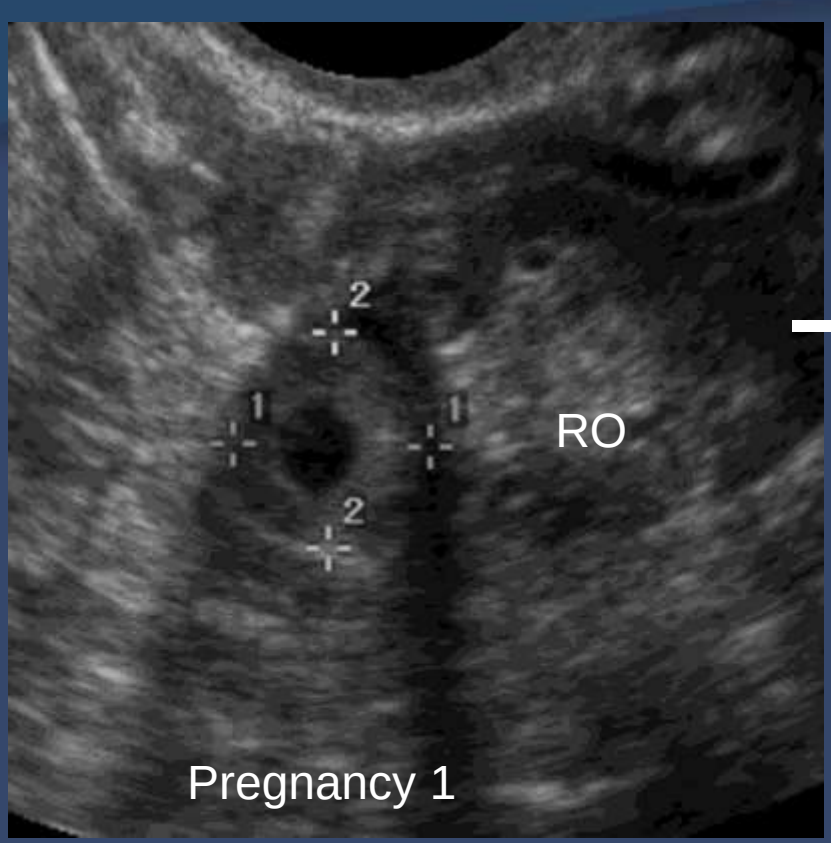


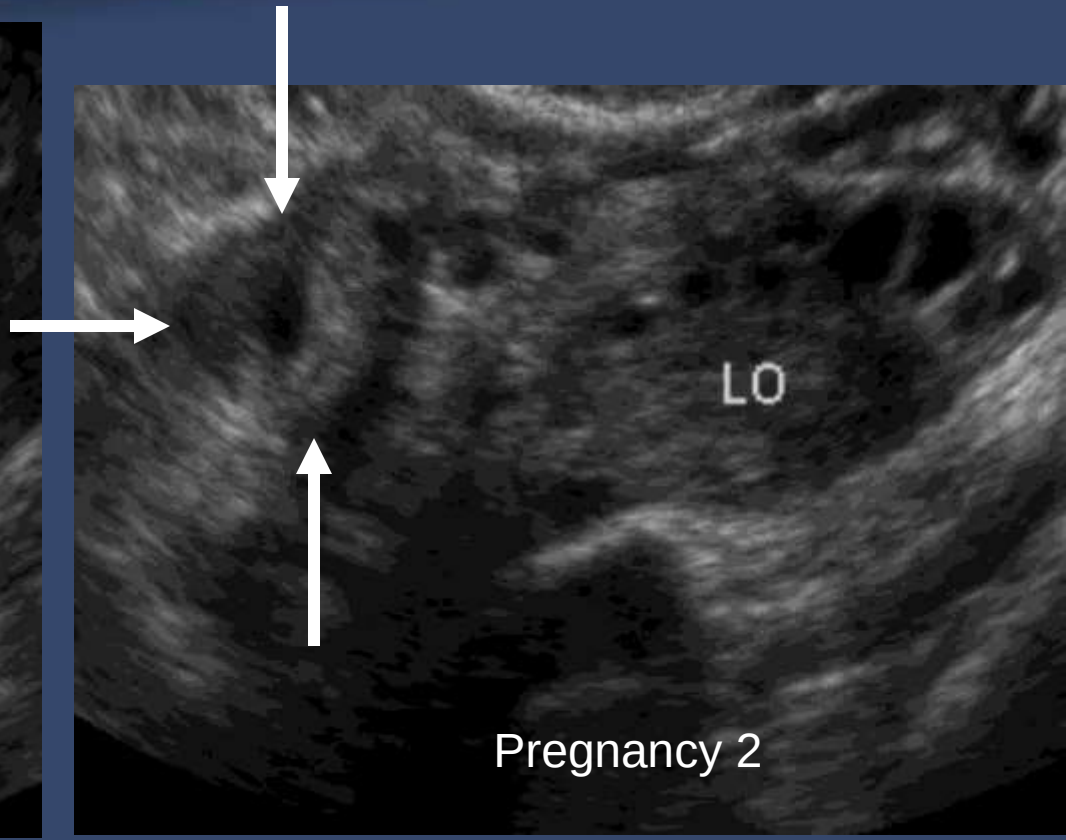






Case: Two prior ectopic pregnancies
Both treated with MTX





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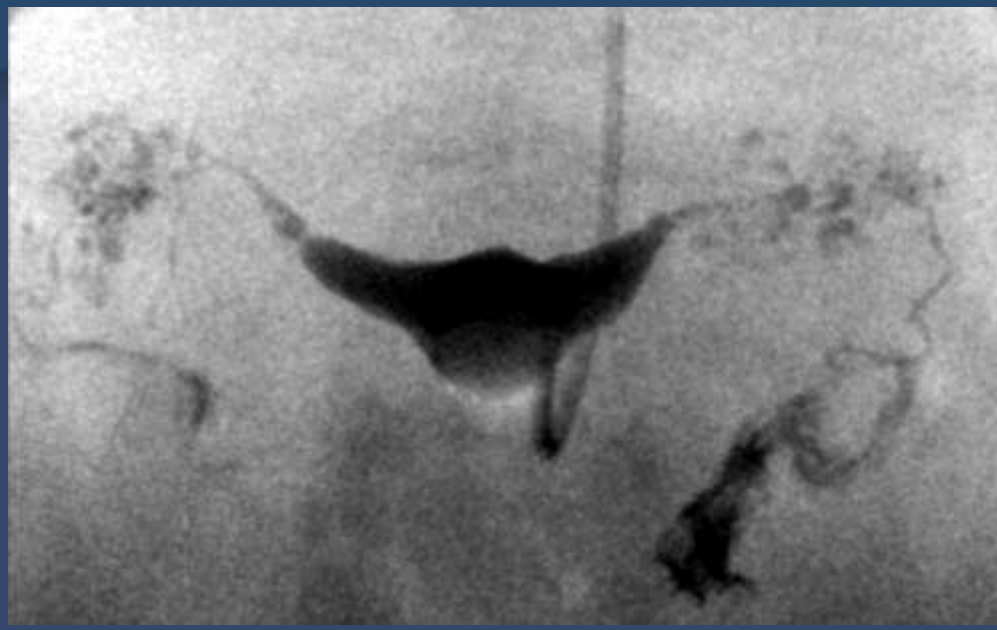
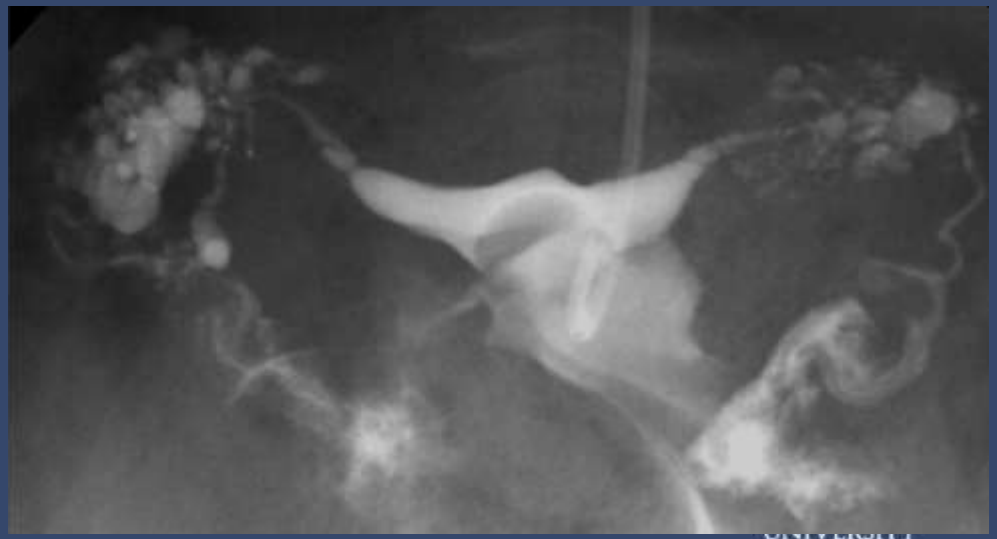
Salpingitis Isthmica Nodosum (SIN)

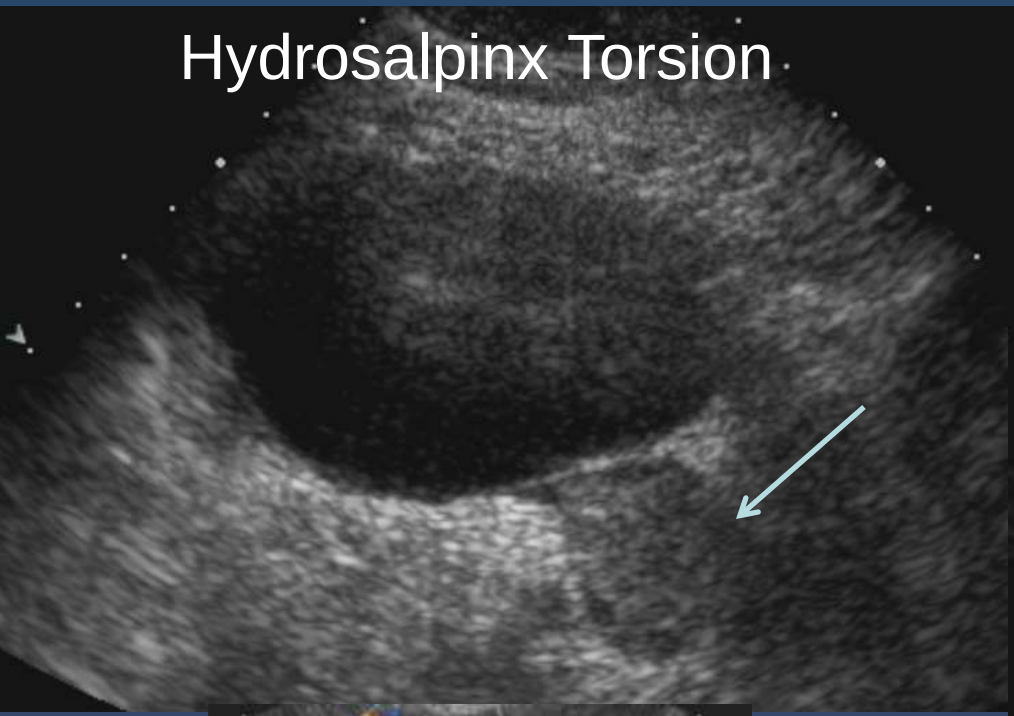
- Diverticula of isthmic portion of fallopian tube
  - Unilateral or bilateral
- Associations:
  - PID
  - Infertility
  - Ectopic pregnancy



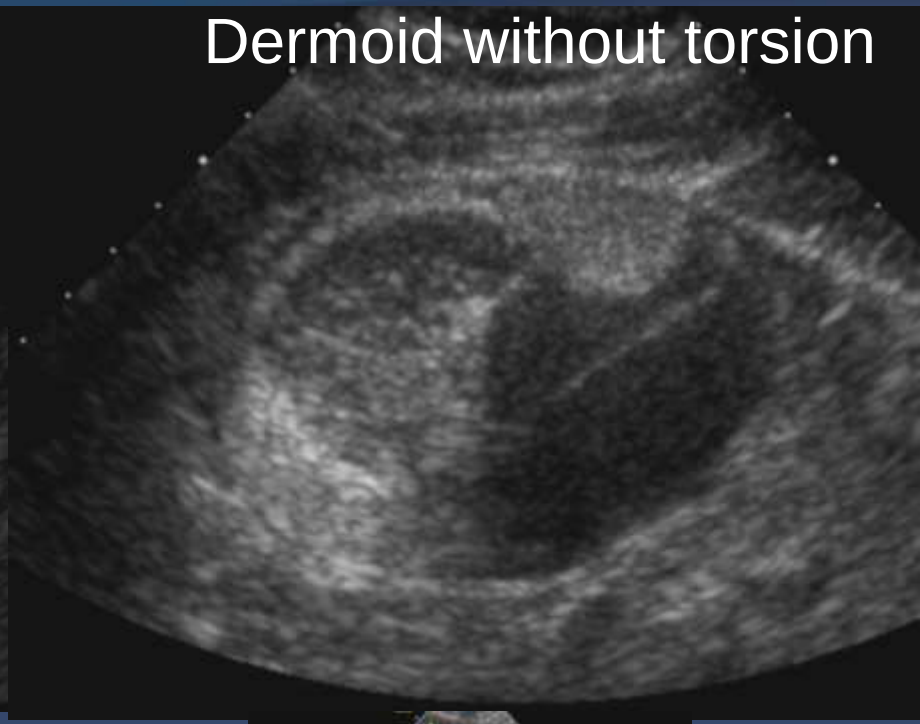


Case: 19 yo with RIGHT-sided adnexal pain, R/O Torsion

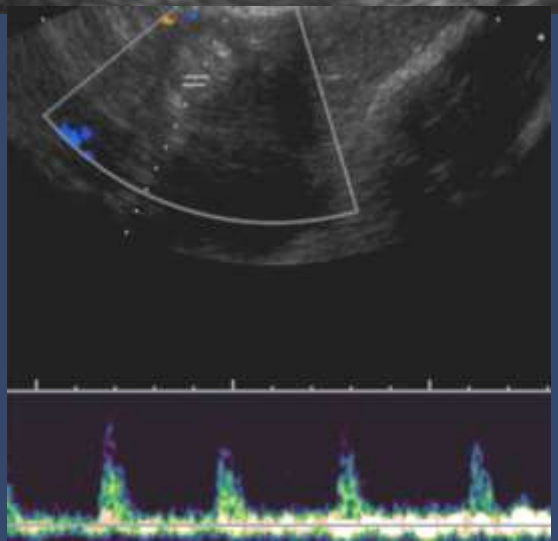
Hydrosalpinx Torsion



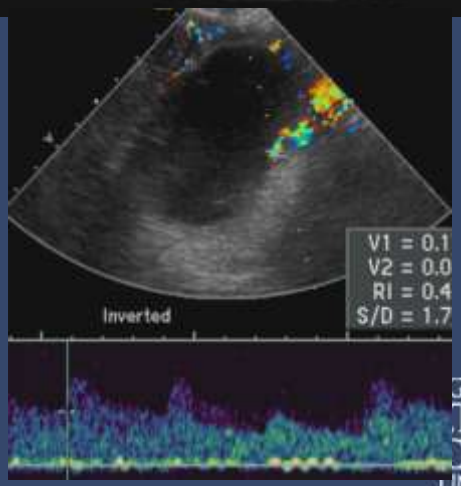
Dermoid without torsion



RT

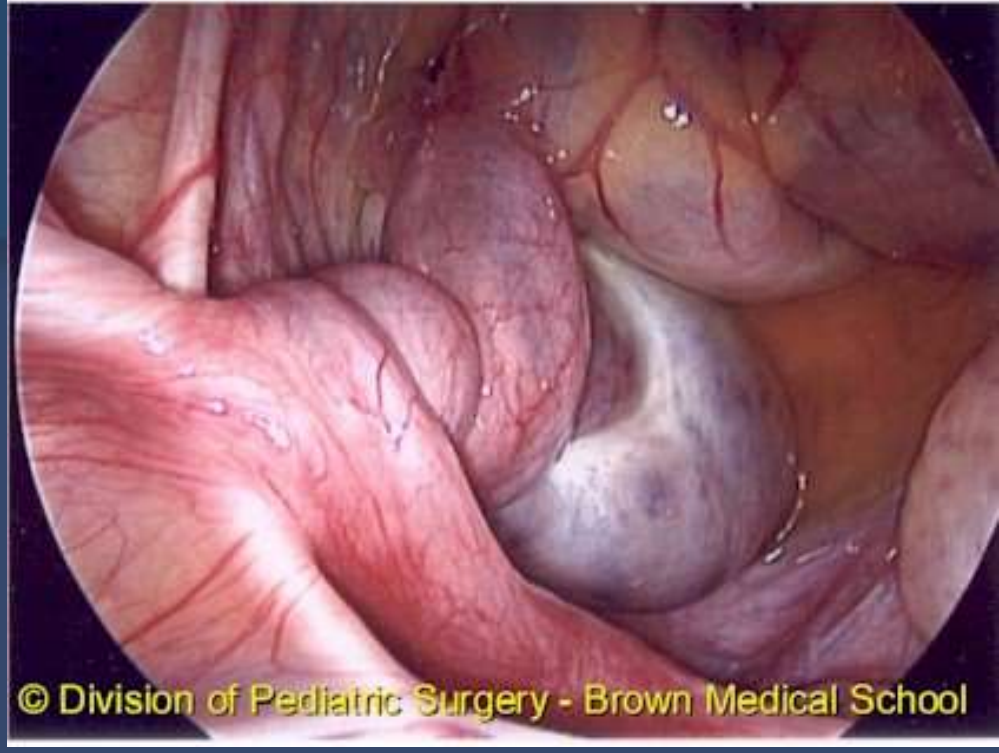


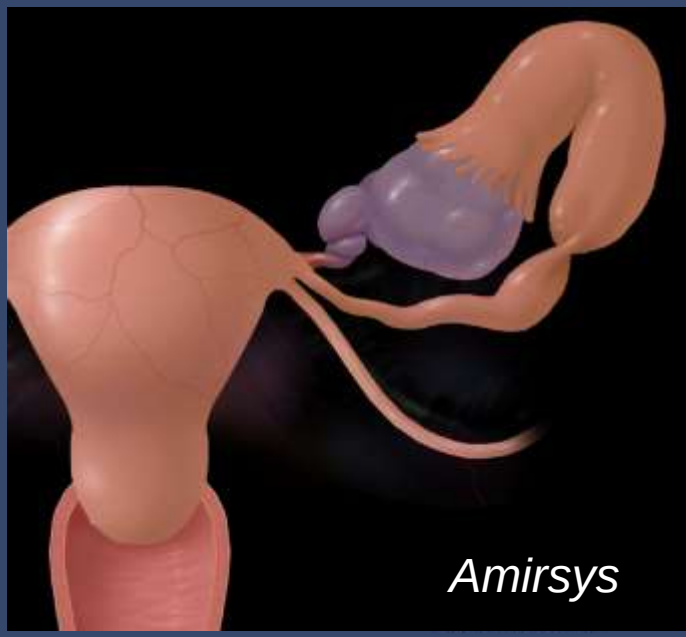
LT



Adnexal Torsion

- Twist of adnexa (long axis)
  - Ovary
  - Fallopian tube
  - Both
- Vascular/lymphatic obstruction
  - Lymphatic first
  - Venous second
  - Arterial last
- Complete vs incomplete
- Intermittent torsion is common

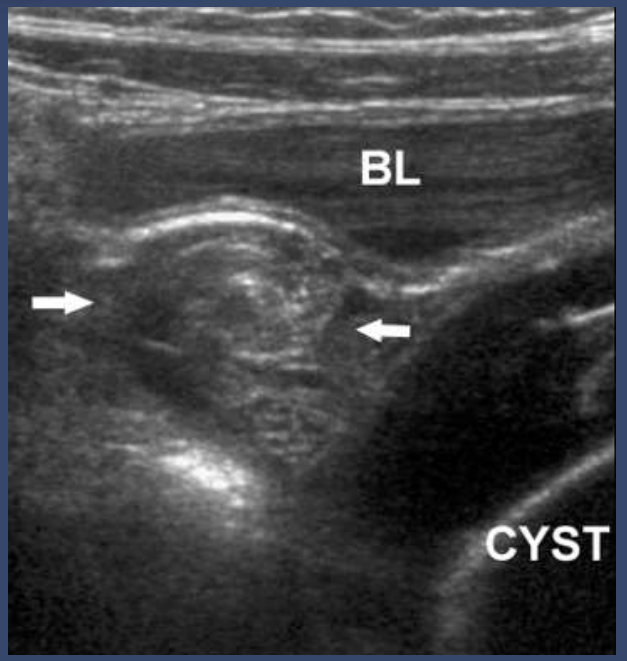


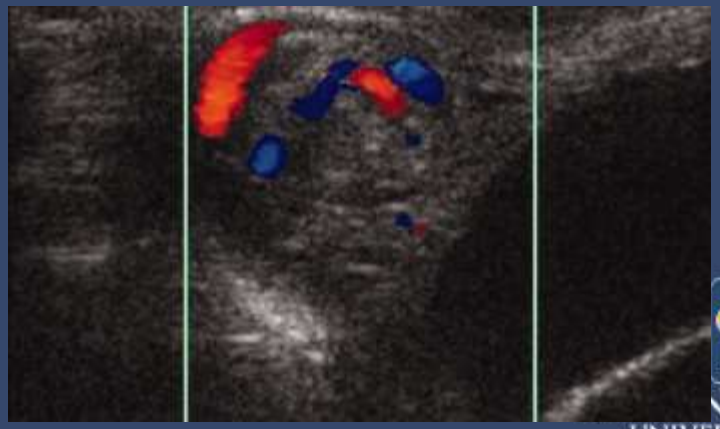


Adnexal Finding: Whirlpool sign

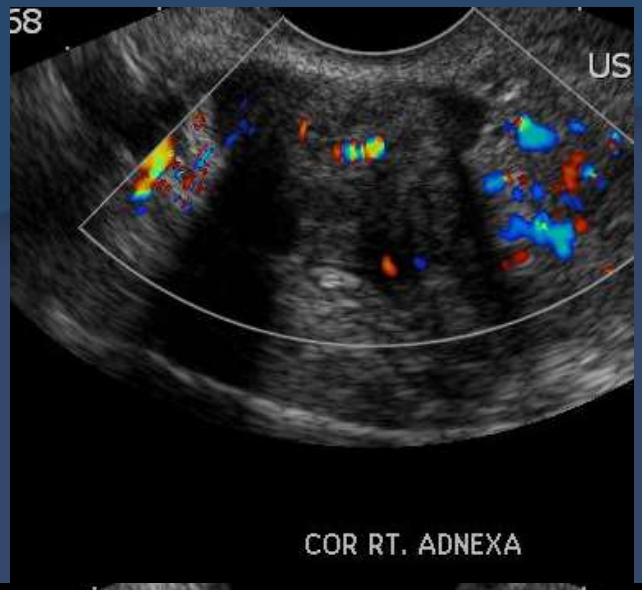
- Twisted vascular pedicle between ovary and uterus
- +/- Color flow
- Target appearance with gray scale

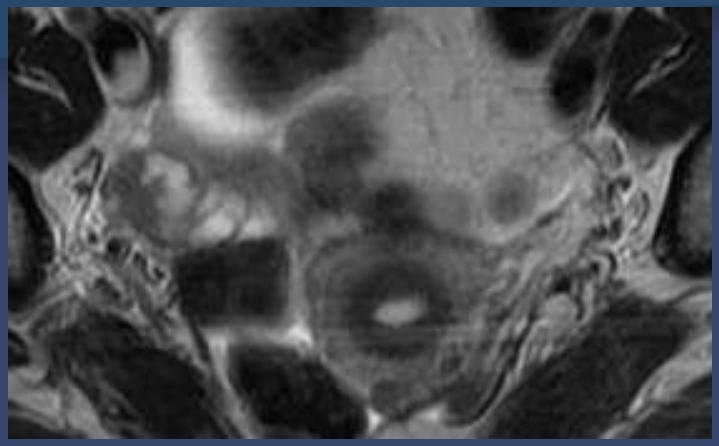
Vijayaraghavan, SB. JUM, 2004

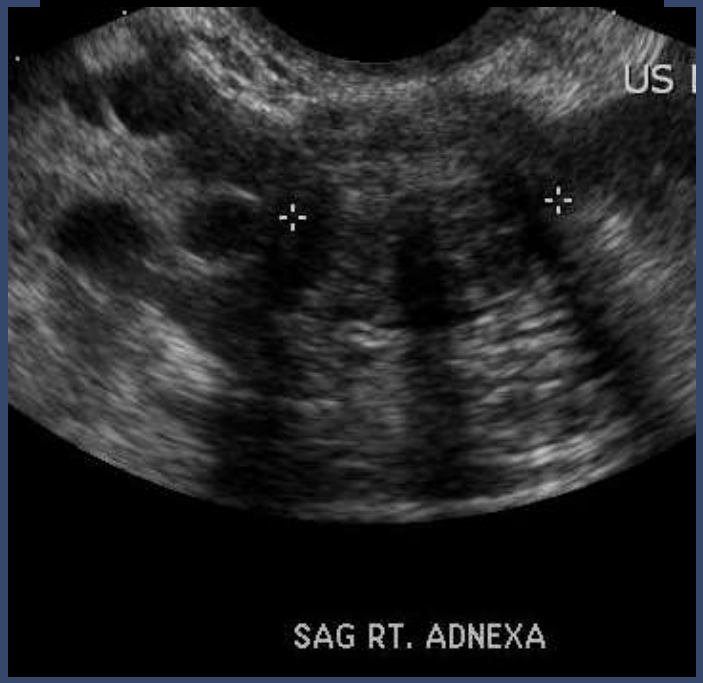


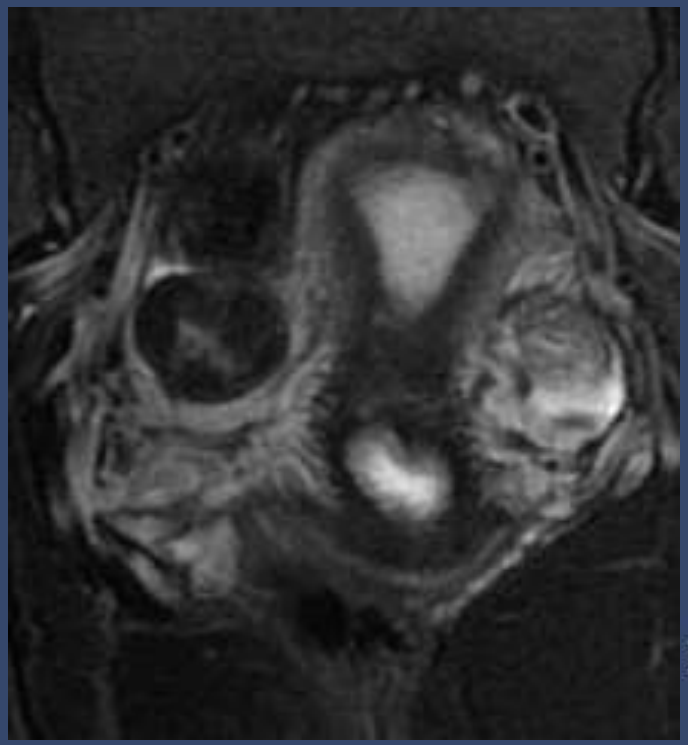


Shifting gears: Referral solid right adnexal mass









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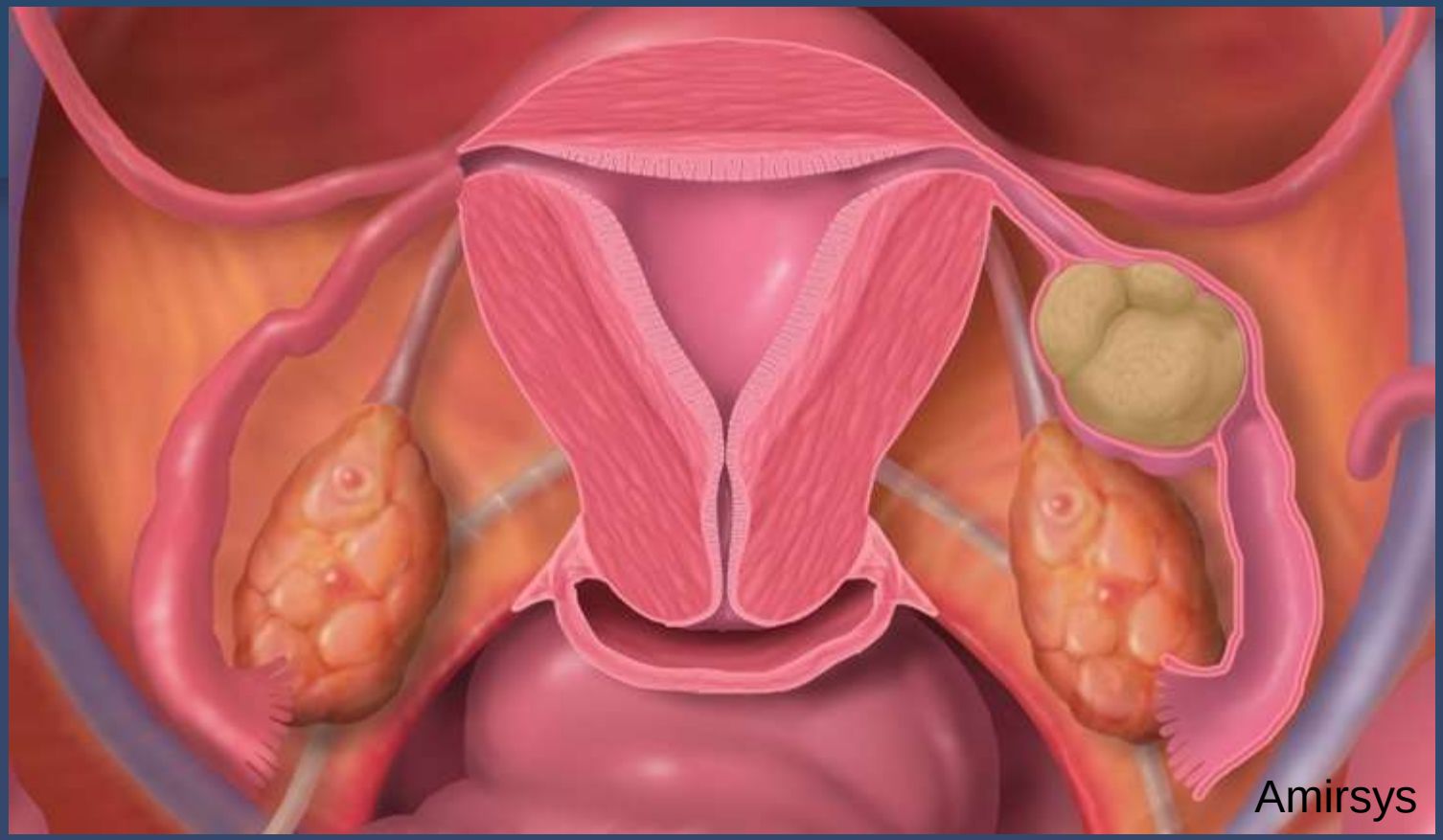
Adnexal Myoma

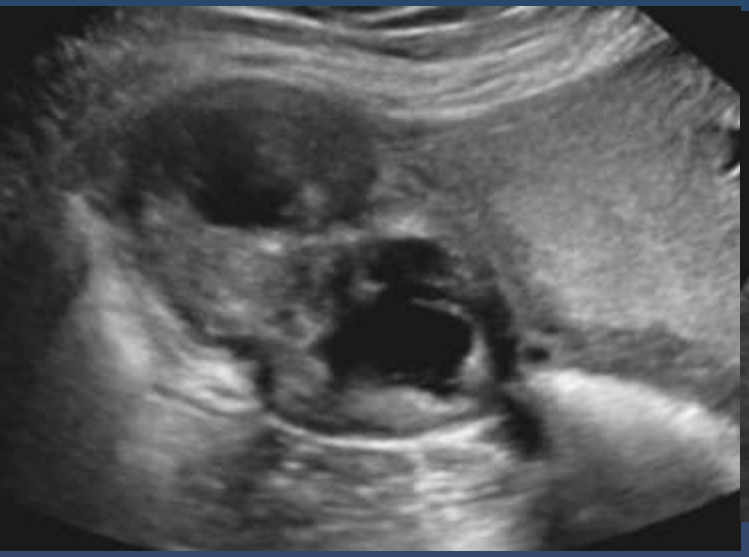


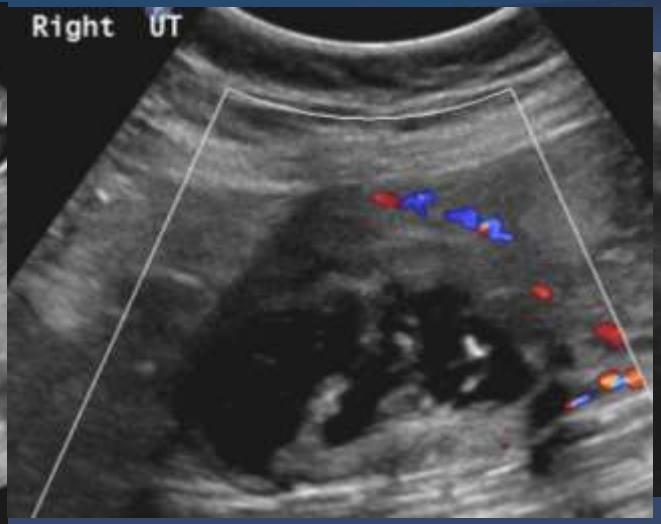
Fallopian tube

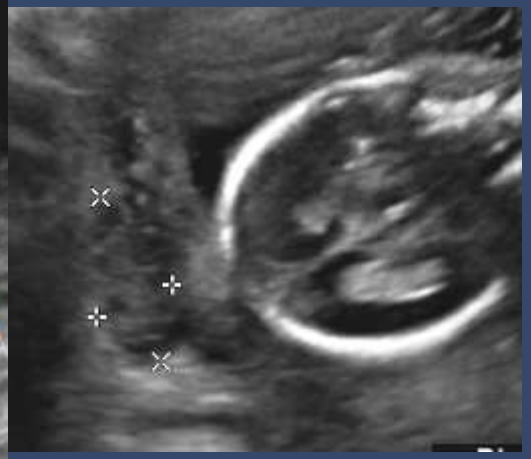
Broad ligament

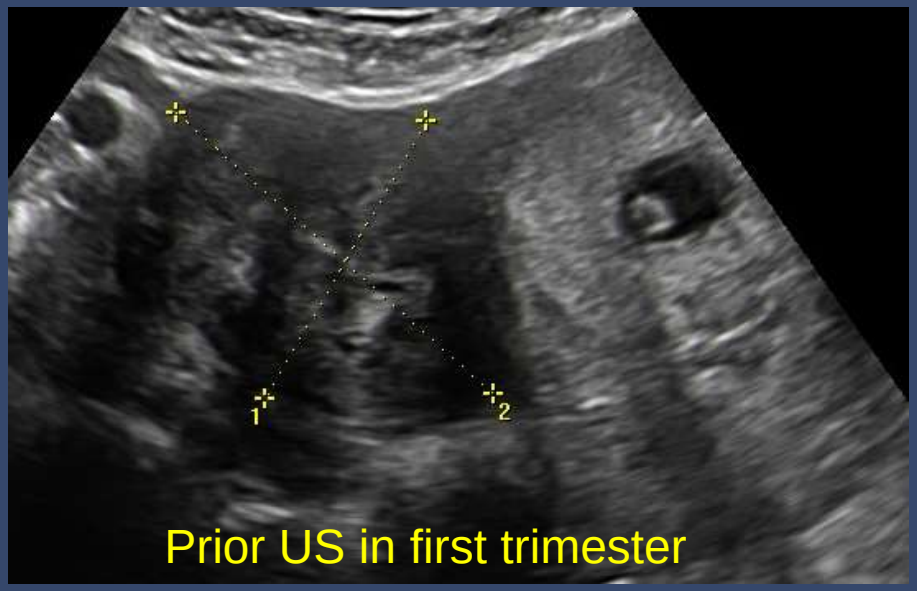
Uterus

Referral for ovarian neoplasm in pregnancy









Prior US in first trimester

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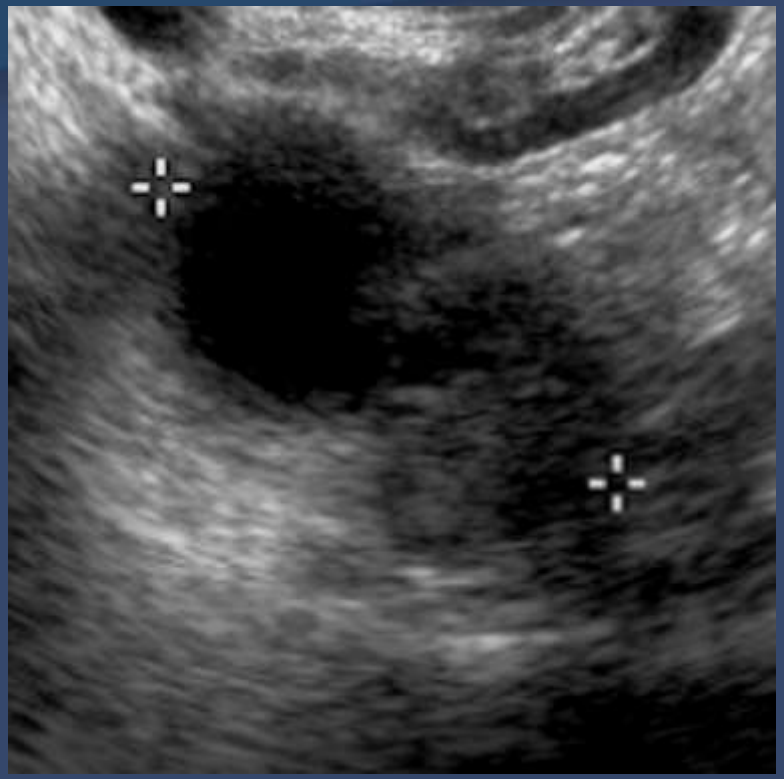
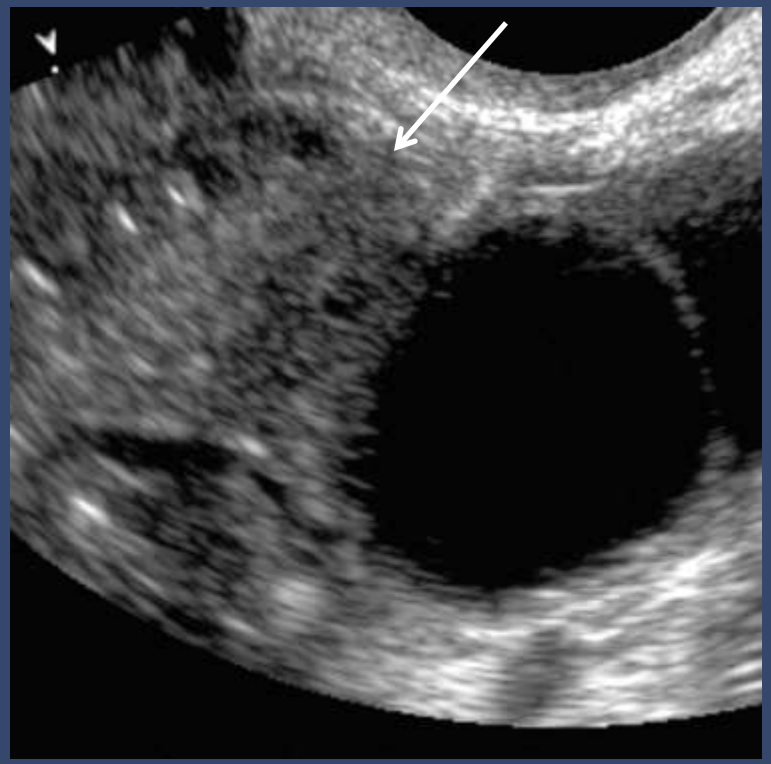
Paraovarian Cyst

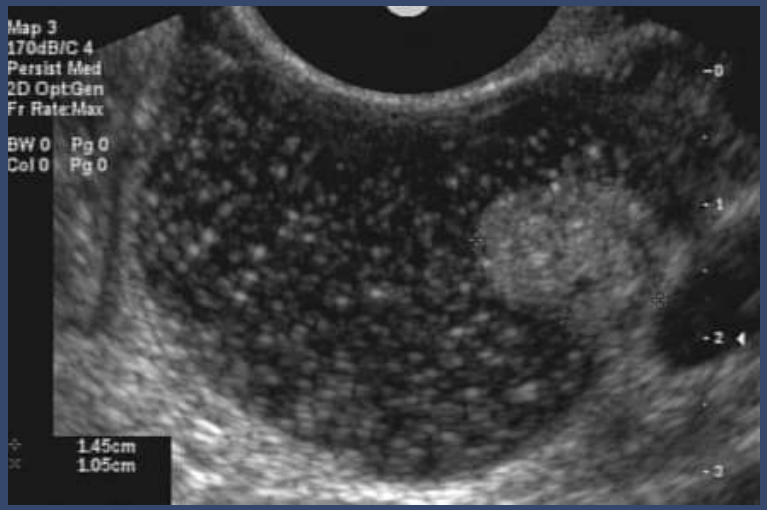




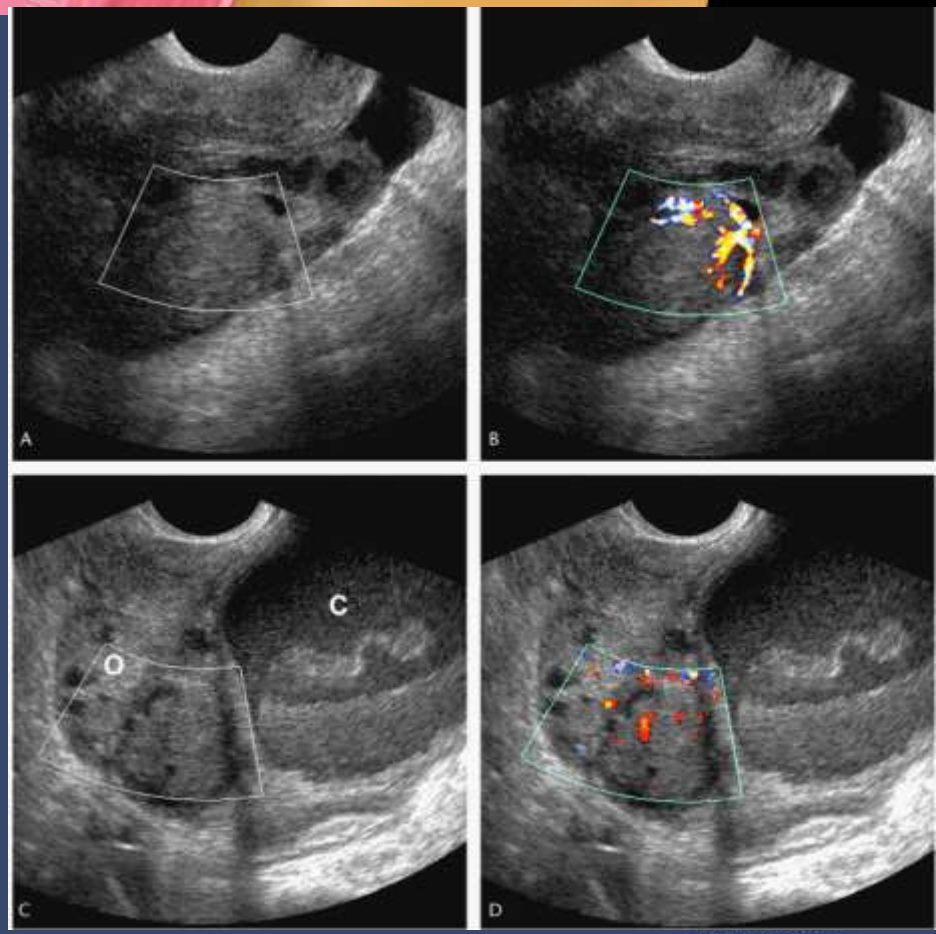
- Paratubal: Originate from mesosalpinx or broad ligament
- Unilocular in 95%, multilocular in 5%
- Thin outer wall
- 2% with malignant features (serous papillary tumors)

Fallopian Tube Neoplasm

- Rare (1500 reported since 1847)
  - 0.5 % of all gyne tumors
- Similar pathology, staging and prognosis as ovarian cancer
- Serous tumors most common
- Mullerian carcinoma, endometroid, LMP tumors



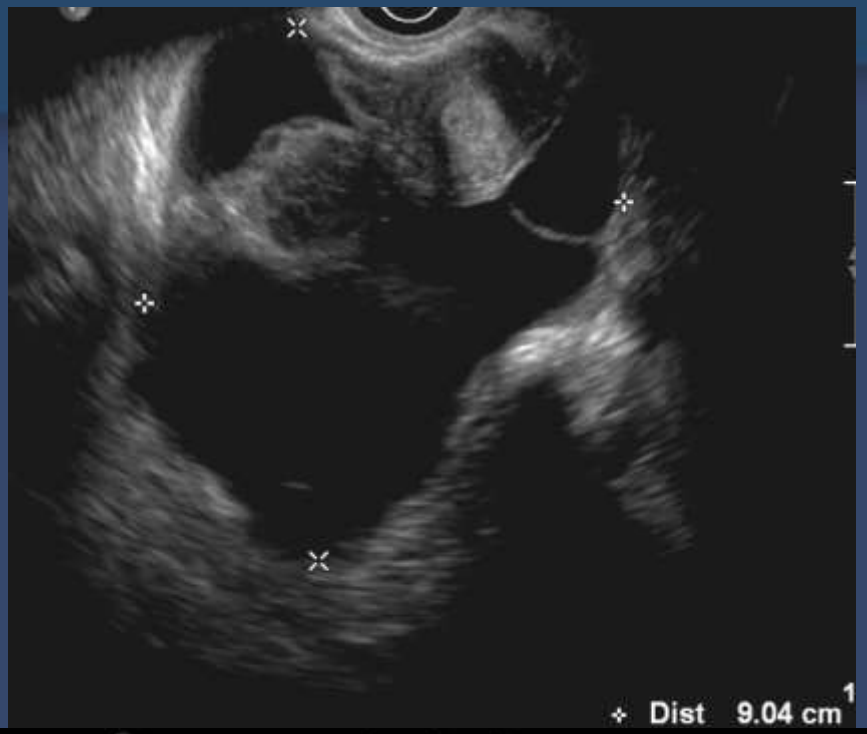
Haratz-Rubenstein N et al.
JUM 23:869-72, 2004

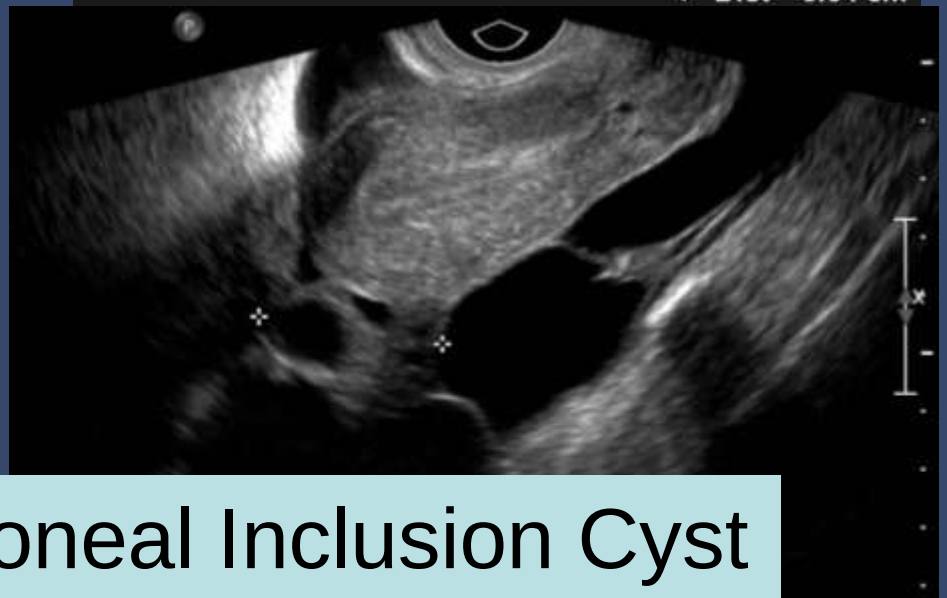


Patlas et al. Primary malignant tumors of the fallopian tubes. Ultrasound Quarterly 20 (2), 2004

Case: 34 yr old with Crohn dz, pelvic surgery and now mass

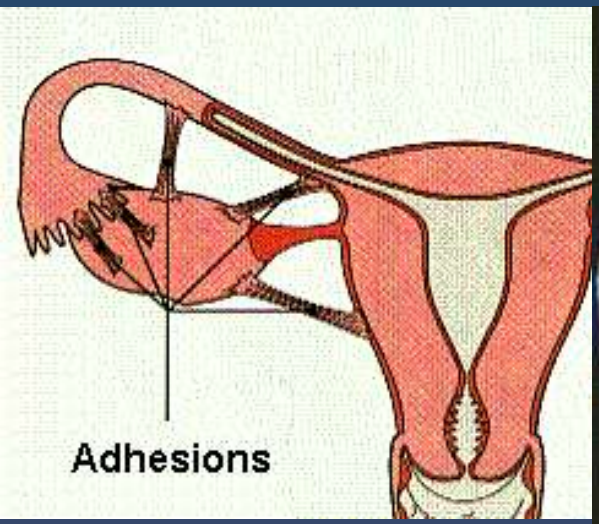
- Large cystic mass
- Follows peritoneal margins, not a wall of it's own
- Ovary is intact within the "mass"
- Ovaries are functional
- Patient has pelvic adhesions

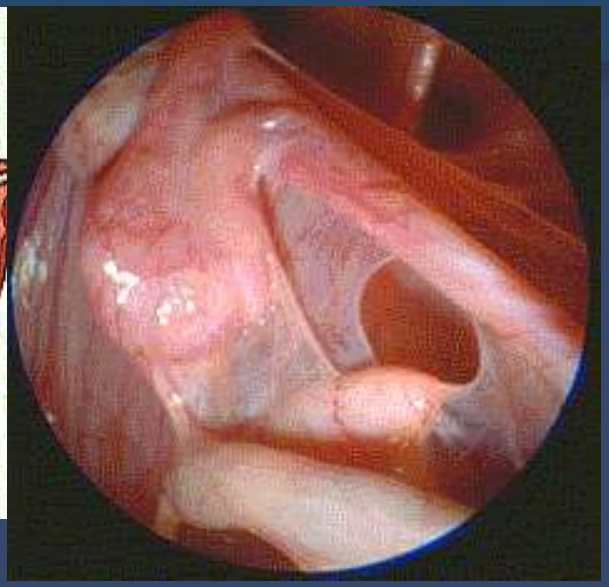


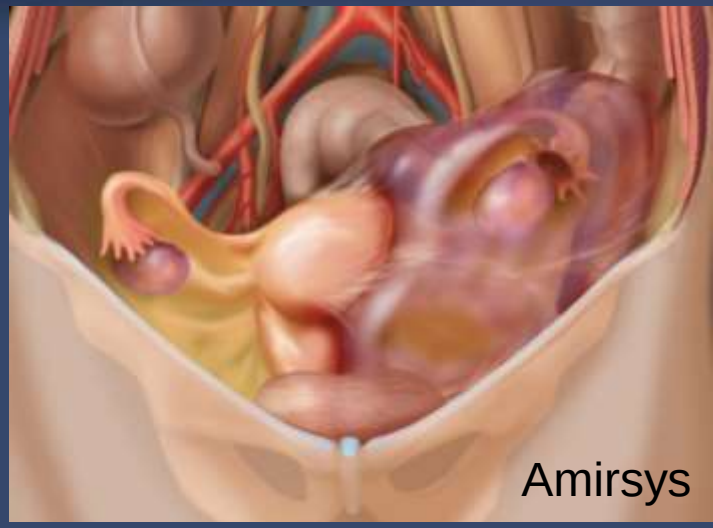


Diagnosis: Peritoneal Inclusion Cyst

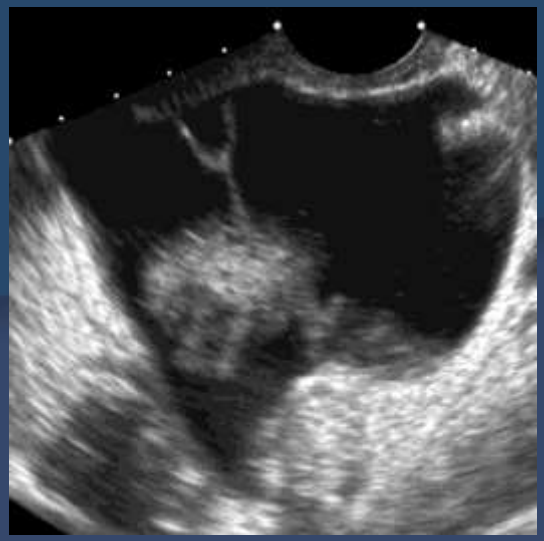
Peritoneal Inclusion Cyst

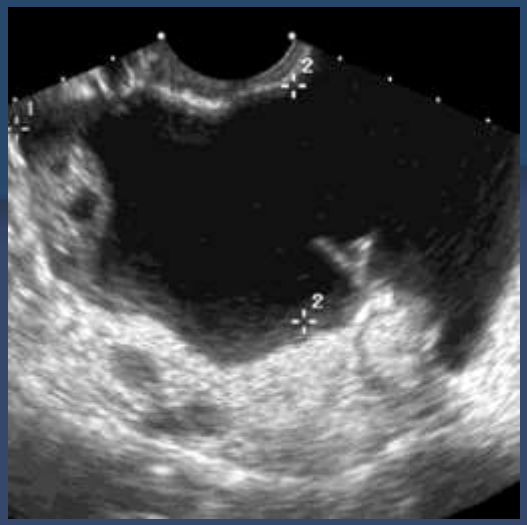






- Terminology (AKA)
  - Peritoneal pseudocyst
  - Benign cystic mesothelioma
  - Benign encysted fluid
  - Entrapped ovarian cysts
  - Inflammatory cysts of pelvic peritoneum
- Definition
  - Ovary and tube and fluid entrapped by adhesions
- Pathophysiology
  - Ovaries are main producers of peritoneal fluid
  - Fluid is trapped by adhesions
  - Bilateral in 35%





At risk patients

- prior surgery, often multiple surgeries
- Inflammatory bowel disease
- same population as patients with tubal lesions
  - Hx of pelvic inflammation causing adhesion
  - PID
  - Endometriosis

Treatment difficulties: 30-50% recurrence with surgery

- Other options
  - Ovarian suppression (Oral contraception, Gonadotropin releasing hormone)
- US guided aspiration: Possibly with sclerosant

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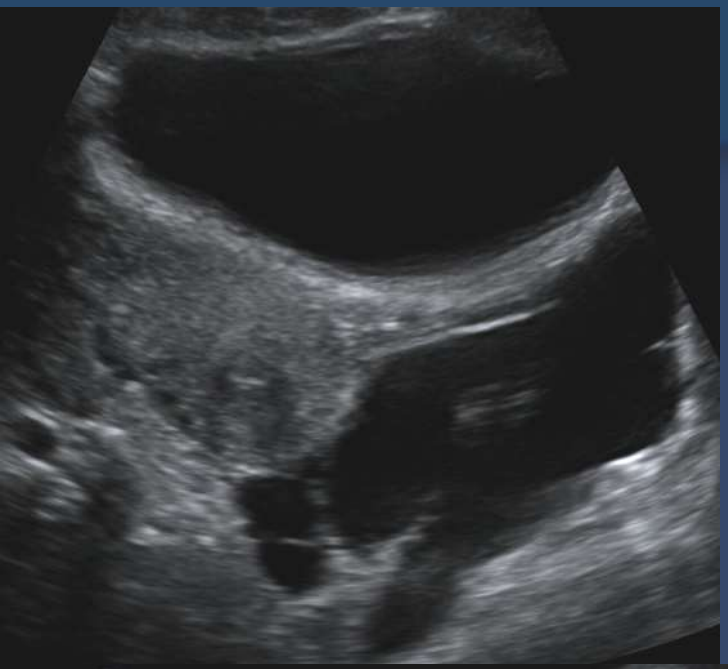
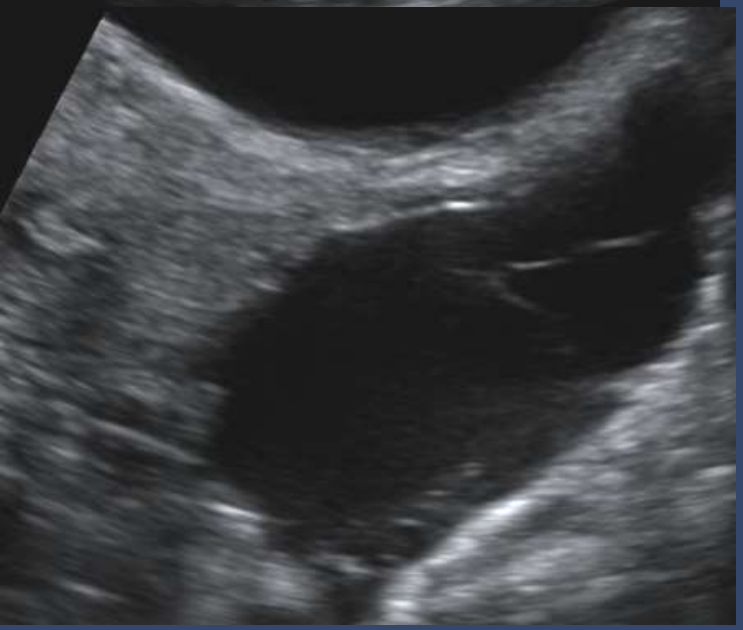
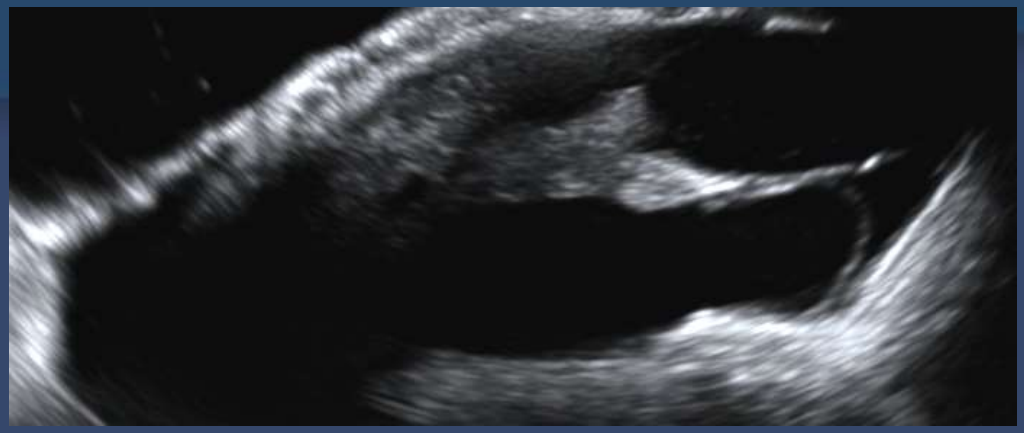
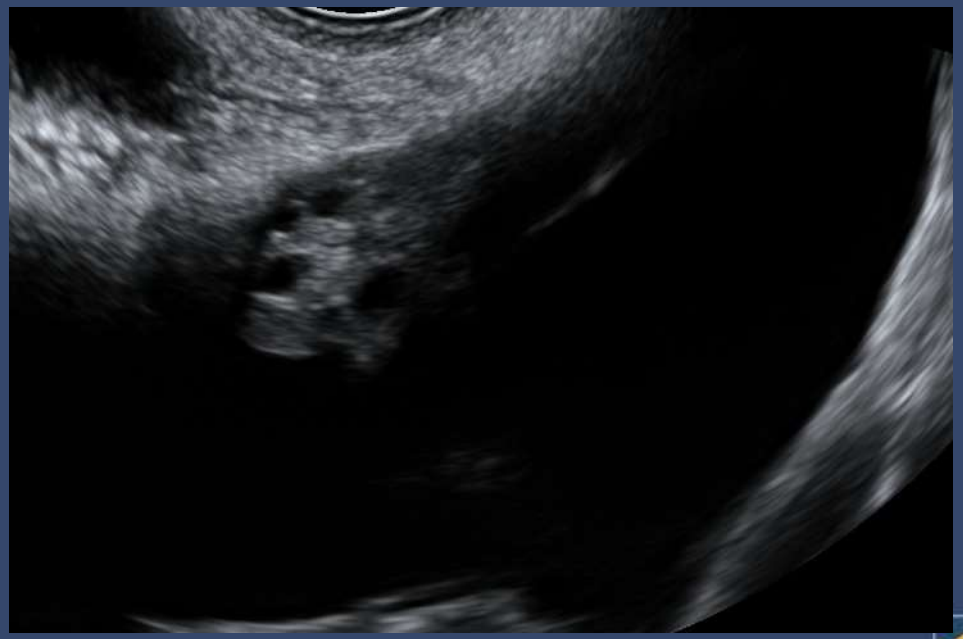
Final PIC Case: 36 yo told she has ovarian cancer









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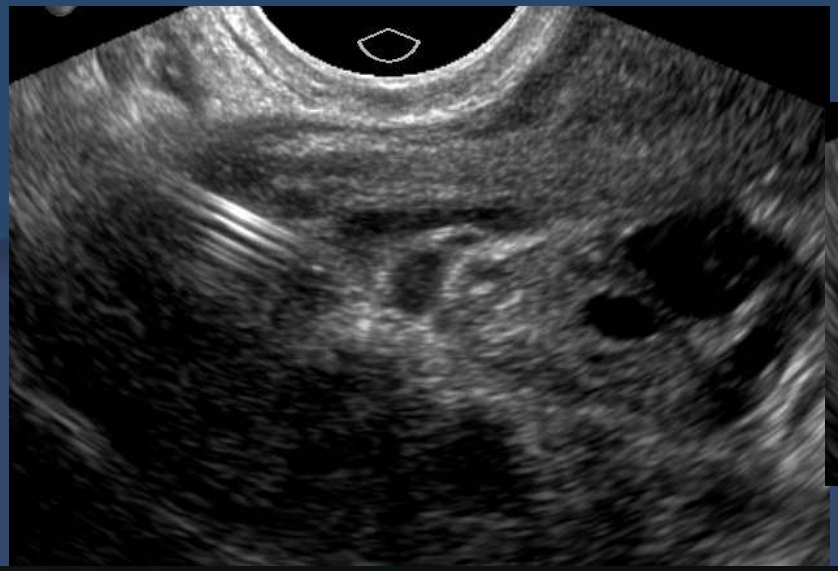
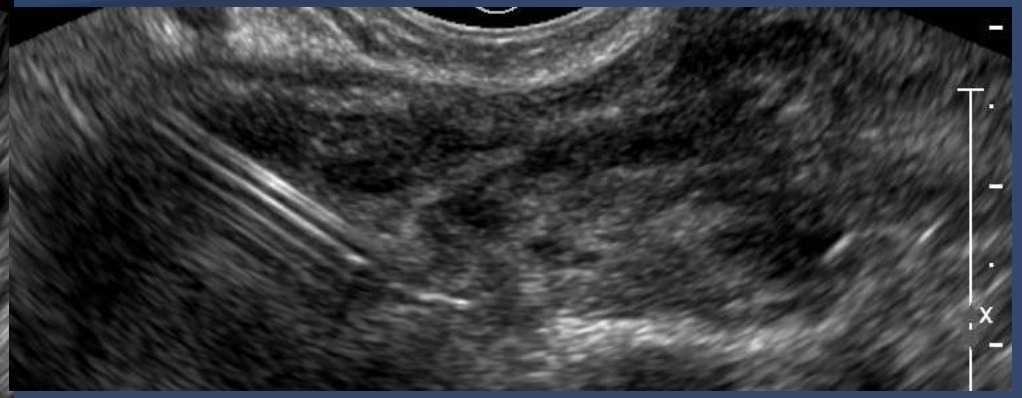
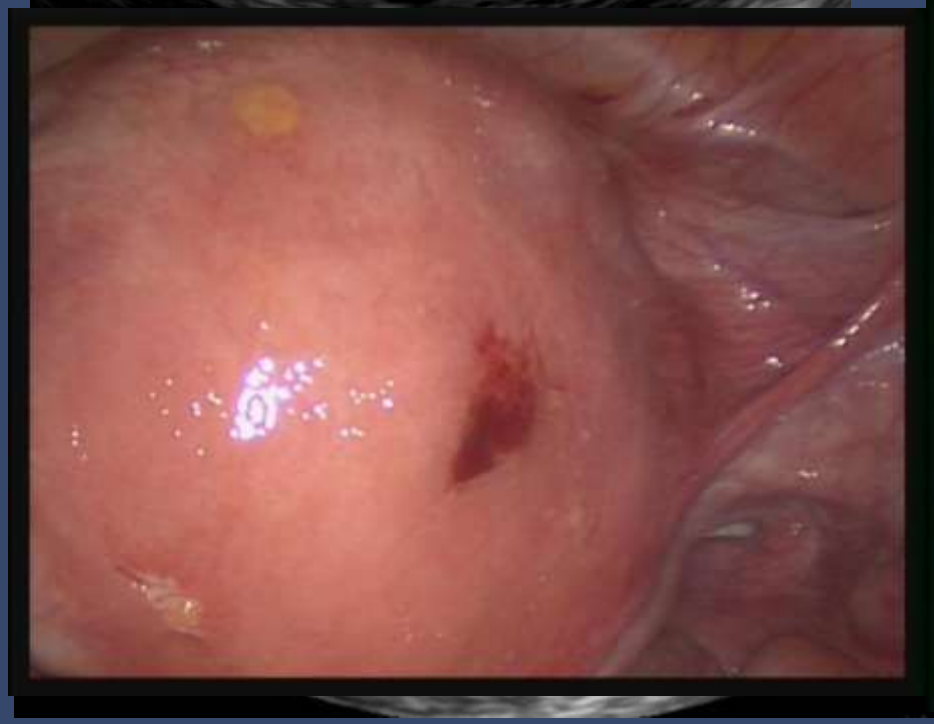
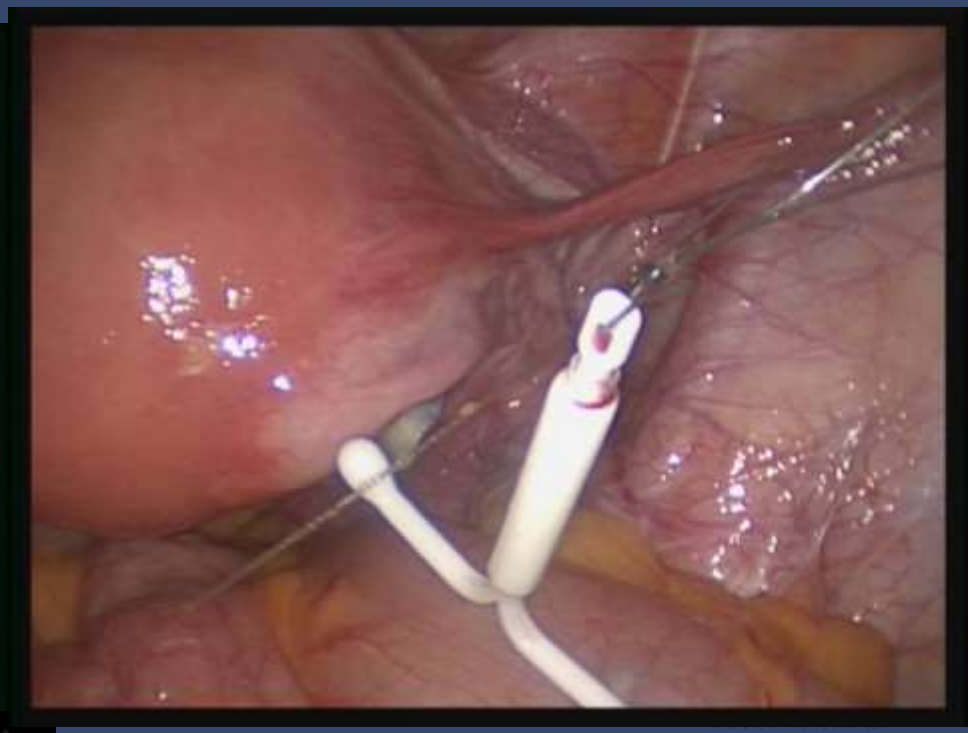
New Case: Right Adnexal Pain, Diagnosis??

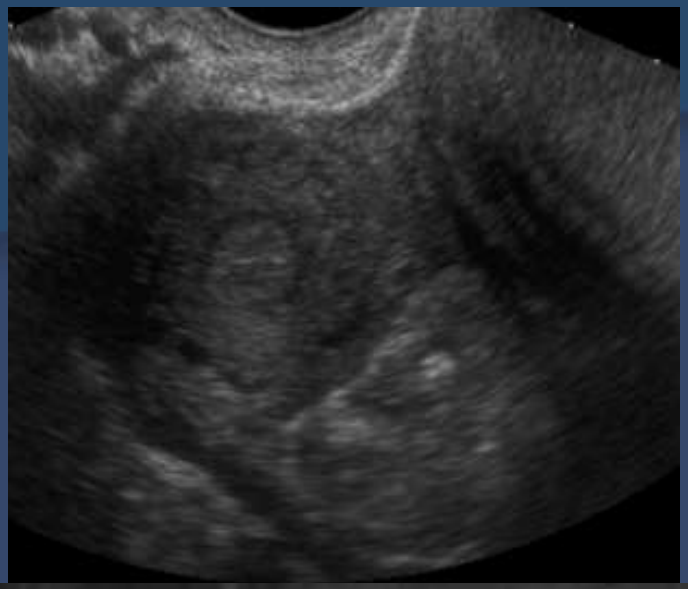


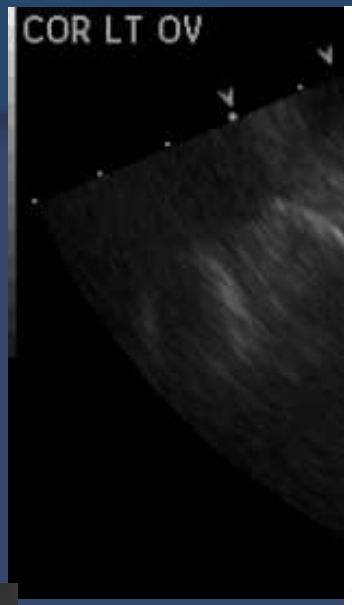


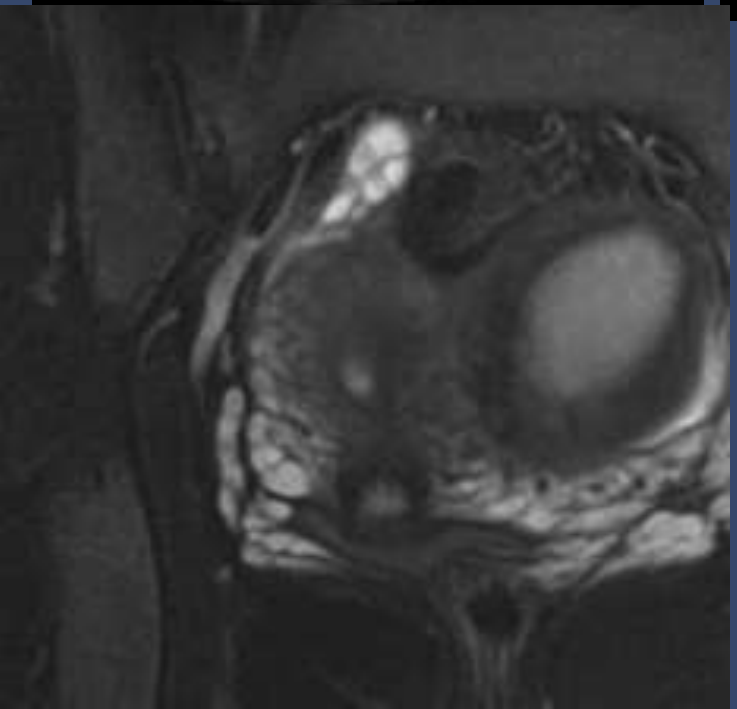


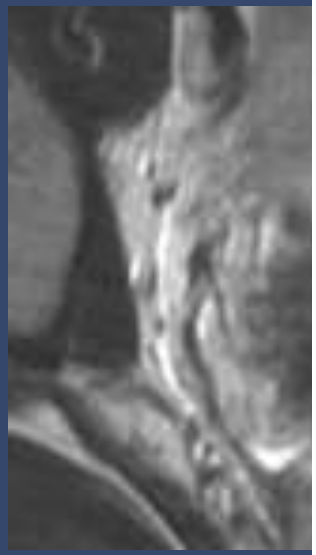


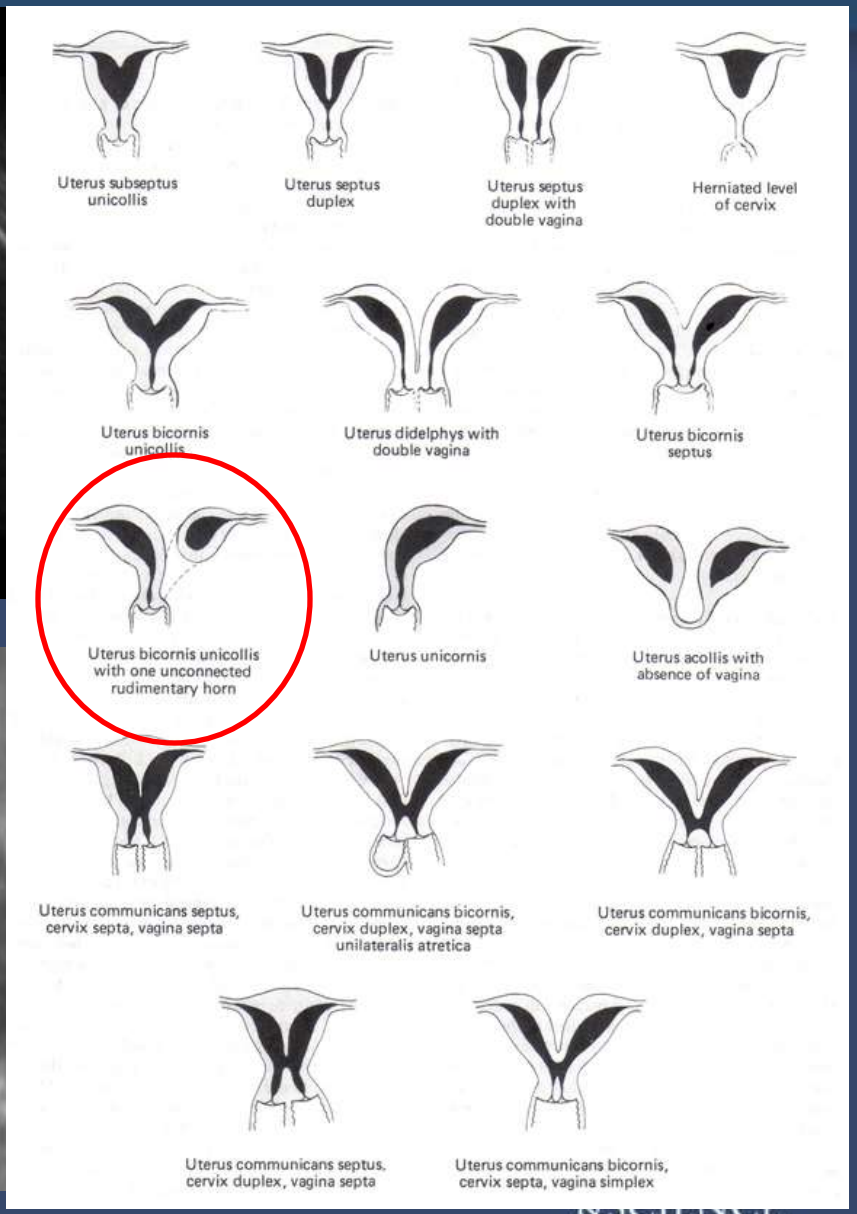
Case: 20 yo with left adnexal mass



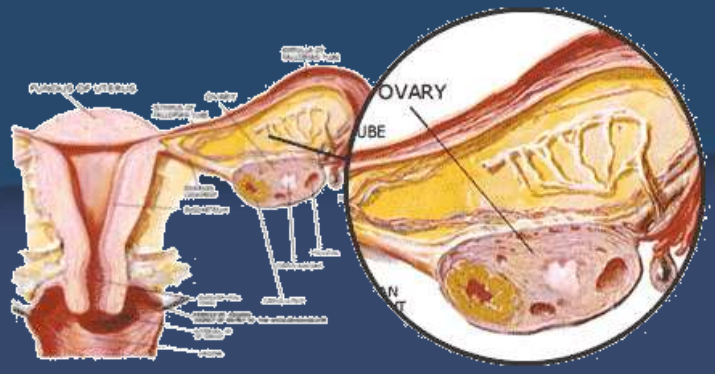








Summary



- Think ADNEXA not ovary
  - Remember all the normal anatomy you don't see with US routinely (but it's there!)
    - Fallopian tubes
    - Broad ligament
    - Peritoneum
- When adnexal mass is seen
  - Look for the ovary anyway

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Non ovarian adnexal masses

Morphology	Key features	diagnosis
Tubular	Anechoic (with wall “nodules”)	Hydrosalpinx
	Filled with echoes	Pyosalpinx Hematosalpinx
Cystic	Unilocular	Paraovarian cyst
Solid	Whirlpool of flow	Torsed fallopian tube
	Blood supply from uterus	Exophytic uterine myoma
	Separate from ovary and uterus	Broad ligament myoma
Mixed cystic/solid	Increased flow	Tubo-ovarian abcess
	With ascites, omental mass	Fallopian tube carcinoma
Septated mass encapsulates ovary	Does not have own discernible wall, follows peritoneal reflections	Peritoneal Inclusion Cyst

Courtesy of Alia Martin, RDMS
OHSU

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