A Practical Approach to Adnexal Masses

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Nothing to disclose
A Practical Approach to Adnexal Masses

- Clinical History
- Location
- Adnexal Lesions
  - Diagnosis
  - Follow Up
Adnexal Mass

Clinical History
Clinical History

- Positive pregnancy test
Clinical History

- Positive pregnancy test
  - Ectopic Pregnancy
Clinical History

- Positive pregnancy test
  - Ectopic Pregnancy
Clinical History

- Signs and Symptoms of Pelvic Inflammatory Disease
Clinical History

- Signs and Symptoms of Pelvic Inflammatory Disease
  - Tubo-ovarian Abscess
Adnexal Mass

Clinical History

Ovary

Extraovarian
Ovarian Location

- Ovarian tissue extending around lesion
Ovarian Location

- Ovarian tissue extending around lesion
Ovarian Location

- Ovarian tissue extending around lesion
- No separate ipsilateral ovary
Extraovarian Location

- Ipsilateral ovary separate from lesion
Extraovarian Location

- Ipsilateral ovary separate from lesion
Common Extraovarian Lesions

- Para-ovarian cyst
  - Also paratubal cyst
Common Extraovarian Lesions

- Para-ovarian cyst
- Hydrosalpinx
  - Tubular
Common Extraovarian Lesions

- Para-ovarian cyst
- Hydrosalpinx
- Peritoneal inclusion cyst
- Uterine fibroid
Adnexal Mass

Clinical History

Ovary

Extraovarian

Simple Cyst
Ultrasound Criteria for a Simple Cyst

- Anechoic
- Imperceptible wall
- Increased through transmission
- Well defined back wall
- No color flow
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Ultrasound Criteria for a Simple Cyst
Simple Cyst
Simple Cyst
What size matters?

- Malignancy in a simple cyst by ultrasound criteria
  - 0.7% Pre-menopausal
  - 1.6% Post-menopausal

What size matters?

- Malignancy in a simple cyst by ultrasound criteria
  - 0.7% Pre-menopausal
  - 1.6% Post-menopausal
  - All malignancies were over 7.5 cm

Follow up Pre-menopausal Simple Cyst

- Less than 5 cm
  - No follow up

Follow up Pre-menopausal Simple Cyst

- Less than 5 cm
  - No follow up
- 5 to 7 cm
  - Could be functional cyst
  - Follow up yearly

Follow up Pre-menopausal
Simple Cyst

- Less than 5 cm
  - No follow up
- 5 to 7 cm
  - Could be functional cyst
  - Follow up yearly
- Over 7 cm
  - Further imaging or Surgical consultation

Follow up Post-menopausal Simple Cyst

- Over 1 cm to 7 cm
  - Follow up yearly

Follow up Post-menopausal Simple Cyst

- Over 1 cm to 7 cm
  - Follow up yearly
- Over 7 cm
  - Further imaging or Surgical consultation

Adnexal Mass

Clinical History

Ovary

Simple Cyst

Benign Lesions

Extraovarian
Hemorrhagic Cyst

- Functional Cysts that develop internal hemorrhage
Hemorrhagic Cyst

- Functional Cysts that develop internal hemorrhage
Ultrasound Appearance of Hemorrhagic Cyst

- Lace-like internal echoes
- Retracting clot
- Complicated cyst without internal flow
- No color flow
Hemorrhagic Cyst

- Lace-like internal echoes
  - Often do not extend all the way across the cyst
- Very thin
Hemorrhagic Cyst

- Lace-like internal echoes
  - Often do not extend all the way across the cyst
  - Very thin
Hemorrhagic Cyst

- Lace-like internal echoes
Hemorrhagic Cyst

- Lace-like internal echoes
Hemorrhagic Cyst

- Retracting clot
  - Echogenicity with a concave margin
Hemorrhagic Cyst

- Retracting clot
  - Echogenicity with a concave margin
Hemorrhagic Cyst

- Complicated cyst without internal flow
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Hemorrhagic Cyst Follow Up

- Pre-menopausal
  - 5 cm or less
    - No follow up

Hemorrhagic Cyst Follow Up

- Pre-menopausal
  - 5 cm or less
    - No follow up
  - Over 5 cm
    - Follow up in 6-12 weeks to document resolution

Hemorrhagic Cyst Follow Up

- Pre-menopausal
  - 5 cm or less
    - No follow up
  - Over 5 cm
    - Follow up in 6-12 weeks to document resolution

- Post-menopausal
  - Follow up in 6-12 weeks to document resolution

Hemorrhagic Cyst Follow Up

6 week follow up Ultrasound
Benign Lesions

- Hemorrhagic Cyst
- Endometrioma
- Mature Cystic Teratoma
Mature Cystic Teratoma

- Also called Dermoid Cyst
Mature Cystic Teratoma

- Also called Dermoid Cyst
- Most common ovarian neoplasm
  - Over 98% benign
Mature Cystic Teratoma

- Also called Dermoid Cyst
- Most common ovarian neoplasm
  - Over 98% benign
- Derive from ovarian germ cells
  - Contain multiple germ cell layers
Mature Cystic Teratoma

- Derive from ovarian germ cells
  - Contains multiple germ cell layers:
    - Ectoderm 100%
      - Skin, skin appendages, nervous system

Hair follicle
Mature Cystic Teratoma

- Derive from ovarian germ cells
  - Contains multiple germ cell layers:
    - Ectoderm 100%
    - Mesoderm 90%
    - Bones, muscles, connective tissue, blood vessels
Mature Cystic Teratoma

- Derive from ovarian germ cells
  - Contains multiple germ cell layers:
    - Ectoderm 100%
    - Mesoderm 90%
    - Endoderm 70%
    - Epithelium of respiratory system, urinary system and digestive tract
Ultrasound Appearance of Mature Cystic Teratoma

- Shadowing echogenicity
- Focal or diffuse increased echogenicity
- Hyperechoic lines and dots
- No color flow
Mature Cystic Teratoma

- Shadowing echogenicity
  - Tip of the iceberg
Mature Cystic Teratoma

- Focal or diffuse increased echogenicity
  - Dermoid Plug, Rokitansky Protuberance/Nodule, Echogenic nodule
Mature Cystic Teratoma

- Focal or diffuse increased echogenicity
  - Dermoid Plug, Rokitansky Protuberance/Nodule, Echogenic nodule
Mature Cystic Teratoma

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- Focal or diffuse increased echogenicity
Mature Cystic Teratoma

- Hyperechoic lines and dots
  - Dermoid mesh
  - Not to be confused with lace like internal echoes
Mature Cystic Teratoma

Mature cystic teratoma

Hemorrhagic cyst
Mature Cystic Teratoma

- Hyperechoic lines and dots
Mature Cystic Teratoma

- Hyperechoic lines and dots
Mature Cystic Teratoma
Follow Up

- Appearance on ultrasound can overlap with endometrioma
- Institution/Referring Physician Dependent
  - CT or MR
    - Fat is diagnostic
  - Surgery
Mature Cystic Teratoma Follow Up

Mature cystic teratoma
Endometrioma
Mature Cystic Teratoma

CT

- Contains any fat density
  - Approximately -50 to -100 HU
Mature Cystic Teratoma

CT

- Contains any fat density
  - Approximately -50 to -100 HU
Mature Cystic Teratoma
Mature Cystic Teratoma
Mature Cystic Teratoma
Mature Cystic Teratoma
Mature Cystic Teratoma

MR

- Contains any fat density
  - High T1 signal
  - Low T1 fat sat signal
  - High T2 signal
Mature Cystic Teratoma

- Contains any fat density
  - High T1 signal
  - Low T1 fat sat signal
  - High T2 signal
Mature Cystic Teratoma Follow Up

T1
Fat Sat
Mature Cystic Teratoma
Follow Up

T1
Fat Sat
Mature Cystic Teratoma

- Complications
  - Torsion
    - Most common during pregnancy
Mature Cystic Teratoma

- Complications
  - Torsion
  - Rupture and chemical peritonitis
    - Less than 1%
Mature Cystic Teratoma

- Complications
  - Torsion
  - Rupture and chemical peritonitis
  - Adhesions
Mature Cystic Teratoma

- Complications
  - Torsion
  - Rupture and chemical peritonitis
  - Adhesions
  - Infection
Mature Cystic Teratoma

- Complications
  - Torsion
  - Rupture and chemical peritonitis
  - Adhesions
  - Infection
  - Malignant degeneration
Mature Cystic Teratoma

- Malignant degeneration
  - 2%
Mature Cystic Teratoma

- Malignant degeneration
  - 2%
  - Differentiated tissues within the mature cystic teratoma give rise to carcinoma or sarcoma
Mature Cystic Teratoma

- Malignant degeneration
  - 2%
  - Differentiated tissues within the mature cystic teratoma give rise to carcinoma or sarcoma
  - Most common is squamous cell carcinoma arising from squamous lining of cyst
Mature Cystic Teratoma

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  - 2%
  - Differentiated tissues within the mature cystic teratoma give rise to carcinoma or sarcoma
- Most common is squamous cell carcinoma arising from squamous lining of cyst
- Occurs in 60s or 70s
Mature Cystic Teratoma

- Malignant degeneration
  - 2%
  - Differentiated tissues within the mature cystic teratoma give rise to carcinoma or sarcoma
- Most common is squamous cell carcinoma arising from squamous lining of cyst
- Occurs in 60s or 70s
Mature Cystic Teratoma
Mature Cystic Teratoma
Mature Cystic Teratoma

Squamous Cell Carcinoma

Small Bowel

Mature Cystic Teratoma
Benign Lesions

- Hemorrhagic Cyst
- Endometrioma
- Mature Cystic Teratoma
Endometriosis

- Endometrial glands and stroma outside the uterus
Endometriosis

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Endometriosis

- Endometrial glands and stroma outside the uterus
- Location
  - Ovaries (80%)
  - Uterosacral ligaments
  - Pouch of Douglas
  - Uterine Serosal Surface
  - Fallopian Tube
  - Rectosigmoid Colon
Ultrasound Appearance of Ovarian Endometrioma

- Diffuse, homogeneous low to medium level internal echoes
- Fluid-fluid or fluid/debris levels
- Echogenic wall foci
- No color flow
Ultrasound Appearance of Ovarian Endometrioma

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Endometrioma

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- Diffuse, homogeneous low to medium level internal echoes
Endometrioma

- Echogenic wall foci
Endometrioma

- Echogenic wall foci
Endometrioma

- Echogenic wall foci
Endometrioma

- Fluid-fluid level
Endometrioma

- Fluid-fluid level
Endometrioma Follow up

- Appearance on ultrasound can overlap with mature cystic teratoma
- Institution/Referring Physician Dependent
  - MR
  - Surgery
MR Appearance of Ovarian Endometrioma

- T2 shading
- High T1 signal
- “lightblub bright” T1 fat sat signal
- No enhancement
MR Appearance of Ovarian Endometrioma

- T2 shading
- High T1 signal
- “lightbulb bright” T1 fat sat signal
- No enhancement
Endometrioma Follow Up
Endometrioma Follow Up

T1 Fat Sat

T2
Endometrioma Follow Up

T2

T1

Fat Sat
Endometrioma Follow Up

T2

T1
Fat Sat
Benign Lesions

- Hemorrhagic Cyst
- Endometrioma
- Mature Cystic Teratoma
Adnexal Mass

Clinical History

Ovary

Simple Cyst

Benign Lesions

Extraovarian

Possible Neoplasm
Possible Neoplasm

- Lesion does not meet criteria for
  - Simple Cyst
  - Hemorrhagic Cyst
  - Mature cystic teratoma
  - Endometrioma
Possible Neoplasm

- Lesion does not meet criteria for
  - Simple Cyst
  - Hemorrhagic Cyst
  - Mature cystic teratoma
  - Endometrioma
- Surgical consultation
Predicting Benign v Malignant Ovarian Neoplasm

- Grey scale and Color Doppler Ultrasound together are most predictive

Predicting Benign v Malignant Ovarian Neoplasm

- Grey scale and Color Doppler Ultrasound together are most predictive
- Do not add predictive value
  - Resistive Index
  - Menopausal Status

Possible Neoplasm

- Complex cyst with color flow
Possible Neoplasm

- Complex cyst with color flow
Possible Neoplasm

- Complex cyst with color flow
- Solid Mass
Possible Neoplasm

- Complex cyst with color flow
- Solid Mass
Complex Cyst with Color Flow
Complex Cyst with Color Flow
Complex Cyst with Color Flow
Complex Cyst with Color Flow
Adnexal Mass

Clinical History
Conclusion-Clinical History

- Positive Pregnancy Test
  - Ectopic Pregnancy
- Signs and symptoms of pelvic inflammatory disease
  - Tubo-ovarian abscess
Adnexal Mass

Clinical History

Ovary

Extraovarian
Conclusion - Location

- Ovarian
  - Ovarian tissue surrounding the lesion
- Extraovarian
  - Separate ipsilateral ovary
Adnexal Mass

Clinical History

Ovary

Simple Cyst

Benign Lesions

Extraovarian

Possible Neoplasm
Conclusion – Simple Cyst

- **Pre-Menopausal**
  - Less then 5 cm
    - No follow up
  - 5-7 cm
    - Yearly Follow up
  - Over 7 cm
    - Further imaging or surgical consultation

- **Post-Menopausal**
  - Over 1 cm to 7 cm
    - Yearly Follow up
  - Over 7 cm
    - Further imaging or surgical consultation
Benign Lesions

Hemorrhagic Cyst

Endometrioma

Mature Cystic Teratoma
Conclusion – Benign Lesions

- **No color flow**
  - Hemorrhagic Cyst
    - Pre menopausal
      - 5 cm or less
      - No follow up
      - Over 5 cm
      - Follow up in 6-12 weeks
    - Post menopausal
      - Follow up 6-12 weeks
  - Mature cystic teratoma
    - CT or MR
    - Surgical consultation
  - Endometrioma
    - MR
    - Surgical consultation
Conclusion – Possible Neoplasm

- Does not meet criteria for
  - Simple cyst
  - Hemorrhagic Cyst
  - Mature cystic teratoma
  - Endometrioma
- Complex cyst with color flow
- Solid Mass
- Surgical consultation
Thank you!