

# Ovarian Malignant Lesions

Topic- based Uworld Questions

Block 1, 2, 7, 8





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Full Screen



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom

A 59-year-old postmenopausal woman comes to the office for evaluation of breast tenderness. The patient first noticed intermittent breast tenderness 4 months ago, which at first was relieved with ibuprofen, but for the past several weeks the tenderness has occurred daily. She has had no breast masses or nipple discharge. The patient has also noticed an increase in her weight, particularly around the abdomen, despite not being able to eat as much. She went through menopause 5 years ago. Mammogram history is normal, including one performed earlier this year. The patient has no chronic medical conditions and has had no previous surgeries. There is no family history of breast, ovarian, or endometrial cancer. Vital signs are normal. BMI is 24 kg/m<sup>2</sup>. Breast examination shows bilateral, diffuse fibrocystic changes. The abdomen is distended, and a large right lower quadrant mass is palpable. Pelvic ultrasound reveals a 12-cm complex right ovarian mass with solid components and multiple septations, a slightly enlarged uterus, and a 9-mm endometrial stripe. Which of the following tumor markers is most likely to be elevated in this patient?

- A. Alpha-fetoprotein
- B. Estradiol
- C. hCG
- D. Lactate dehydrogenase
- E. Testosterone
- F. Thyroxine

**Submit**

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- A. Alpha-fetoprotein (9%)
- B. Estradiol (73%)
- C. hCG (10%)
- D. Lactate dehydrogenase (4%)
- E. Testosterone (0%)
- F. Thyroxine (1%)

Omitted

Correct answer

B



73%

Answered correctly



02 secs

Time Spent



04/21/2020

Last Updated

Explanation

Granulosa cell tumor	
<b>Pathogenesis</b>	<ul style="list-style-type: none"> <li>• Sex cord–stromal tumor</li> <li>• ↑ Estradiol</li> <li>• ↑ Inhibin</li> </ul>
<b>Clinical features</b>	<ul style="list-style-type: none"> <li>• Complex ovarian mass</li> <li>• Juvenile subtype               <ul style="list-style-type: none"> <li>◦ Precocious puberty</li> </ul> </li> <li>• Adult subtype               <ul style="list-style-type: none"> <li>◦ Breast tenderness</li> <li>◦ Abnormal uterine bleeding</li> <li>◦ Postmenopausal bleeding</li> </ul> </li> </ul>
<b>Histopathology</b>	<ul style="list-style-type: none"> <li>• Call-Exner bodies (cells in rosette pattern)</li> </ul>
<b>Management</b>	<ul style="list-style-type: none"> <li>• Endometrial biopsy (endometrial cancer)</li> <li>• Surgery (tumor staging)</li> </ul>

This patient's **bilateral breast tenderness** and fibrocystic changes (due to increased breast tissue proliferation) are suggestive of estrogen exposure. The additional symptoms of increasing abdominal girth, early satiety, and a **complex ovarian mass** are concerning for an ovarian malignancy—specifically, a **granulosa cell tumor**, a type of ovarian sex cord-stromal tumor.

Granulosa cells are the primary components of the ovarian stroma and function in converting testosterone to estradiol via aromatase. They secrete both **estradiol** (via aromatization of testosterone) and **inhibin** (which suppresses pituitary FSH release via negative feedback). Malignant proliferation of granulosa cells can cause high estradiol levels that affect the breast (eg, tenderness) and endometrium (eg, unopposed proliferation). Therefore, patients can have concomitant endometrial hyperplasia/cancer that presents in postmenopausal women as an **enlarged uterus** with abnormal uterine bleeding or a **thickened (>4 mm) endometrial stripe** on ultrasound. Patients are managed surgically and require monitoring for disease progression or recurrence with serum inhibin levels.

management

- Surgery (tumor staging)

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**(Choice A)** Alpha-fetoprotein is secreted by yolk sac tumors, an aggressive germ cell tumor. Because these tumors are rapidly-growing, patients typically present with abdominal pain. There is no associated breast tenderness.

**(Choice C)** Elevated hCG levels occur in embryonal carcinomas (an ovarian germ cell tumor) and gestational trophoblastic disease (eg, hydatidiform mole). Patients with an embryonal carcinoma have rapid-onset pelvic pain. Those with a hydatidiform mole can have uterine enlargement, bilateral ovarian masses (ie, theca lutein cysts), hyperemesis gravidarum, or hyperthyroid symptoms. The breast tenderness that occurs with elevated hCG (eg, during early pregnancy) is due to elevated estrogen.

**(Choice D)** Lactate dehydrogenase is secreted by dysgerminomas, malignant germ cell tumors that typically present as rapidly enlarging, painful masses. There is no associated breast tenderness or thickened endometrium.

**(Choice E)** Sertoli-Leydig cell tumors, a sex cord-stromal ovarian tumor, secrete testosterone; therefore, patients have virilization (eg, acne, clitoromegaly) and hypoestrogenism (eg, breast atrophy, thin endometrium).

**(Choice F)** Mature teratomas are benign ovarian germ cell tumors that occasionally secrete thyroxine (eg, struma ovarii). Most patients are asymptomatic; however, symptomatic patients typically have weight loss despite an increased appetite due to the increased metabolic rate associated with elevated thyroxine levels.

**(Choice C)** Elevated hCG levels occur in embryonal carcinomas (an ovarian germ cell tumor) and gestational trophoblastic disease (eg, hydatidiform mole). Patients with an embryonal carcinoma have rapid-onset pelvic pain. Those with a hydatidiform mole can have uterine enlargement, bilateral ovarian masses (ie, theca lutein cysts), hyperemesis gravidarum, or hyperthyroid symptoms. The breast tenderness that occurs with elevated hCG (eg, during early pregnancy) is due to elevated estrogen.

**(Choice D)** Lactate dehydrogenase is secreted by dysgerminomas, malignant germ cell tumors that typically present as rapidly enlarging, painful masses. There is no associated breast tenderness or thickened endometrium.

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**(Choice F)** Mature teratomas are benign ovarian germ cell tumors that occasionally secrete thyroxine (eg, struma ovarii). Most patients are asymptomatic; however, symptomatic patients typically have weight loss despite an increased appetite due to the increased metabolic rate associated with elevated thyroxine levels.

#### Educational objective:

Granulosa cells are the primary component of the ovarian stroma and convert testosterone to estradiol via aromatase. Malignant proliferation of these cells (ie, granulosa cell tumor) results in high estradiol levels that affect breast tissue (eg, tenderness, fibrocystic changes) and the uterine lining (eg, postmenopausal thickened endometrium).

#### References

- [Recent advances in granulosa cell tumor ovary: a review.](#)
- [Ovarian sex-cord stromal tumours and small cell tumours: pathological, genetic and management aspects.](#)
- [Granulosa cell tumor of the ovary: tumor review.](#)

A 53-year-old woman, gravida 2 para 2, comes to the office due to right-sided pelvic pain that has worsened over the past 3 months. She has experienced bloating and hot flashes since her last menstrual period a year ago. The patient has recently become sexually active with a new partner and is not using condoms. She was diagnosed and treated for chlamydia in her 40s. She has no other medical problems and had a bilateral tubal ligation at age 35 after cesarean delivery of her second child. The patient smokes 10 cigarettes daily and drinks alcohol socially. Her temperature is 36.7 C (98 F) and blood pressure is 110/70 mm Hg. Leukocyte count is 8200/mm<sup>3</sup>.  $\beta$ -hCG is undetectable. Pelvic ultrasonography shows a 7-cm right ovarian mass with solid components, thick septations, and a moderate amount of peritoneal fluid. Which of the following is the most likely explanation for these findings?

- A. Abnormal proliferation of tubal epithelium
- B. Ascending infection from the cervix
- C. Ectopic implantation of endometrial glands
- D. Excessive growth of well-differentiated ectodermal cells
- E. Obstruction from fluid accumulation in the fallopian tube

**Submit**

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- A. Abnormal proliferation of tubal epithelium (40%)
- B. Ascending infection from the cervix (4%)
- C. Ectopic implantation of endometrial glands (5%)
- D. Excessive growth of well-differentiated ectodermal cells (44%)
- E. Obstruction from fluid accumulation in the fallopian tube (4%)

Omitted

Correct answer

A



40%

Answered correctly



02 secs

Time Spent



06/14/2020

Last Updated

Explanation

**Epithelial ovarian carcinoma****Clinical**

- Acute: shortness of breath, obstipation/constipation with vomiting, abdominal distension



Epithelial ovarian carcinoma	
<b>Clinical presentation</b>	<ul style="list-style-type: none"> <li>• Acute: shortness of breath, obstipation/constipation with vomiting, abdominal distension</li> <li>• Subacute: pelvic/abdominal pain, bloating, early satiety</li> <li>• Asymptomatic adnexal mass</li> </ul>
<b>Laboratory findings</b>	<ul style="list-style-type: none"> <li>• ↑ CA-125</li> </ul>
<b>Ultrasound findings</b>	<ul style="list-style-type: none"> <li>• Solid mass</li> <li>• Thick septations</li> <li>• Ascites</li> </ul>
<b>Management</b>	<ul style="list-style-type: none"> <li>• Exploratory laparotomy</li> </ul>

**Epithelial ovarian carcinoma** refers to a malignancy involving the **ovary, fallopian tube, and peritoneum**. Histologically, abnormalities can begin at any of these sites and present with the hallmark large ovarian mass and widespread pelvic and abdominal metastasis regardless of primary origin.

**Ultrasound** is the first-line imaging modality to investigate pelvic pain and/or an adnexal mass. This patient's findings of a large ovarian mass with **thick septations, solid** components, and peritoneal free fluid (**ascites**) are concerning for malignancy rather than a benign or infectious etiology. The presence of peritoneal fluid in a postmenopausal woman is pathologic and is the origin of the typical symptoms of **bloating, pain**, early satiety/anorexia, and abdominal distension seen in ovarian cancer.

**(Choice B)** Ascending infection from the cervix causes pelvic inflammatory disease with a potential complication of tubo-ovarian abscess (TOA). A TOA appears as a complex multilocular mass involving the tube and ovary on pelvic ultrasound. Pelvic inflammatory disease is unlikely in a patient without a fever and leukocytosis.

**(Choice C)** Endometriomas are ovarian masses arising from ectopic implantation of endometrial gland on the ovarian surface, and are a common cause of pelvic pain in premenopausal patients. Ultrasonography demonstrates a homogenous cyst with internal echoes (eg, "ground glass") rather than a multiloculated mass with septations in a postmenopausal patient.

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**(Choice D)** Hyperechoic nodules and calcifications are ultrasound features of a mature cystic teratoma (eg, dermoid cyst), a benign ovarian tumor arising from ectodermal cells. Dermoid cysts can have solid components but do not exhibit multiple septae or cause ascites.

**(Choice E)** A hydrosalpinx is caused by fluid accumulation in a fallopian tube due to blockage by either adhesions (eg, pelvic inflammatory disease) or surgery (eg, bilateral tubal ligation). Ultrasound would demonstrate a mass separate from the ovary rather than an ovarian tumor.

#### Educational objective:

Ovarian cancer can present as an adnexal mass with pelvic pain and bloating due to abnormal proliferation of ovarian or tubal epithelium or peritoneum. Ultrasound features suggesting malignancy are a solid mass with thick septations and the presence of ascites.

#### References

- [Adnexal masses: characterization and imaging strategies.](#)

A 22-year-old nulligravid woman comes to the office for worsening acne on her face and body over the last 6 months. She initially attributed the acne to her diet and has been eating healthier to improve the acne and lose weight. The patient has lost 6.8 kg (15 lb) in the last 3 months, but the acne has not improved. She has no chronic medical conditions and has had no surgeries. The patient does not use tobacco, alcohol, or illicit drugs. Her father has type 2 diabetes mellitus and her mother has hyperlipidemia. Blood pressure is 138/86 mm Hg and pulse is 72/min. BMI is 42 kg/m<sup>2</sup>. Coarse hair is noted on the chin and upper lip. Nodulocystic acne is present on the face, chest, and back. Pelvic examination shows an enlarged clitoris but otherwise normal external genitalia. Bimanual examination is limited by body habitus. Laboratory results reveal elevated total testosterone and normal dehydroepiandrosterone sulfate. Which of the following is the most likely diagnosis in this patient?

- A. 21-hydroxylase deficiency
- B. Adrenocortical carcinoma
- C. Aromatase deficiency
- D. Polycystic ovary syndrome
- E. Sertoli-Leydig cell tumor

**Submit**



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- A. 21-hydroxylase deficiency (6%)
- B. Adrenocortical carcinoma (1%)
- C. Aromatase deficiency (9%)
- D. Polycystic ovary syndrome (46%)
- E. Sertoli-Leydig cell tumor (36%)

**Omitted**Correct answer  
E36%  
Answered correctly02 secs  
Time Spent01/15/2020  
Last Updated

Explanation

**Sertoli-Leydig cell tumor**

Sertoli-Leydig cell tumor	
<b>Pathogenesis</b>	<ul style="list-style-type: none"> <li>• Sex cord–stromal tumor</li> <li>• ↑ Testosterone</li> </ul>
<b>Clinical features</b>	<ul style="list-style-type: none"> <li>• Rapid-onset virilization               <ul style="list-style-type: none"> <li>◦ Voice deepening</li> <li>◦ Male-pattern balding</li> <li>◦ Increased muscle mass</li> <li>◦ Clitoromegaly</li> </ul> </li> <li>• Oligomenorrhea</li> <li>• Unilateral, solid adnexal mass</li> </ul>
<b>Management</b>	<ul style="list-style-type: none"> <li>• Surgery (tumor staging)</li> </ul>

This patient's severe hyperandrogenism—defined by either **virilization** (eg, enlarged clitoris) or **rapid-onset (<1 year) hyperandrogenism** (eg, hirsutism, nodulocystic acne)—is suggestive of an **androgen-secreting tumor**. Additional clinical features of androgen-secreting tumors and resultant virilization include bitemporal male-pattern balding, voice deepening, and increased muscle mass. Most androgen-secreting tumors arise from either the ovaries or adrenal glands, which can be distinguished from one another by the type of androgen produced. Ovarian androgen-secreting tumors produce markedly elevated testosterone levels (>150 ng/dL), whereas adrenal tumors produce elevated dehydroepiandrosterone sulfate (DHEAS) levels (>700 mcg/dL).

This patient's **elevated testosterone and normal DHEAS** indicate an ovarian source for her virilization—most likely a **Sertoli-Leydig cell tumor**, a testosterone-secreting, sex cord–stromal **ovarian tumor**. The best next step in evaluation is a pelvic ultrasound, which may visualize a complex adnexal mass. Management includes surgical excision of the tumor and cancer staging.

**(Choice A)** Classic congenital adrenal hyperplasia (CAH), due to 21-hydroxylase deficiency, typically presents during infancy as a salt-wasting adrenal crisis; girls also have ambiguous genitalia. Nonclassic CAH typically presents in young women with slowly progressive (over years) hyperandrogenism and abnormal uterine bleeding; true virilization is uncommon. Both types of CAH cause elevated 17-hydroxyprogesterone,

**(Choice A)** Classic congenital adrenal hyperplasia (CAH), due to 21-hydroxylase deficiency, typically presents during infancy as a salt-wasting adrenal crisis; girls also have ambiguous genitalia. Nonclassic CAH typically presents in young women with slowly progressive (over years) hyperandrogenism and abnormal uterine bleeding; true virilization is uncommon. Both types of CAH cause elevated 17-hydroxyprogesterone, rather than testosterone, levels.

**(Choice B)** Adrenocortical carcinomas can cause rapid-onset virilization and some constitutional symptoms (eg, weight loss). However, patients with androgen-secreting tumors of adrenal origin have elevated DHEAS levels, which are not seen in this patient.

**(Choice C)** Aromatase deficiency causes maternal and fetal virilization during pregnancy due to placental inability to convert DHEAS to estradiol. Therefore, individuals with aromatase deficiency have elevated DHEAS levels, in contrast with this patient.

**(Choice D)** Polycystic ovary syndrome (PCOS) is a common cause of hyperandrogenism, abnormal uterine bleeding, and mildly elevated testosterone levels, particularly in obese patients. However, PCOS rarely results in the markedly elevated testosterone levels that cause virilization (eg, voice deepening, clitoromegaly), making this diagnosis less likely.

#### Educational objective:

Patients with a rapid onset (<1 year) of virilization should be evaluated for an androgen-secreting tumor of ovarian or adrenal origin. An elevated testosterone level and normal dehydroepiandrosterone sulfate (DHEAS) level are typically due to an ovarian source (eg, Sertoli-Leydig cell tumor). In contrast, elevated DHEAS and normal testosterone levels are typically due to an adrenal tumor.

#### References

- [Ovarian Sertoli-Leydig cell tumours: how typical is their typical presentation?](#)
- [Clinicopathologic features of ovarian Sertoli-Leydig cell tumors.](#)

Obstetrics &amp; Gynecology

Subject

Female Reproductive System &amp; Breast

System

Ovarian cancer

Topic

A 62-year-old nulligravid woman comes to the office for follow-up after right adnexal enlargement was found on routine pelvic examination 2 weeks ago. Pelvic ultrasound reveals a 5-cm right ovarian cyst. Menopause occurred at age 52, and the patient has had no postmenopausal spotting or bleeding. She had an abnormal Papanicolaou test in her 20s that subsequently tested as normal, and her medical history is otherwise unremarkable. The patient has never had any surgeries. There is no family history of ovarian or breast cancer. Her most recent mammogram 2 months ago showed no abnormalities. Which of the following is the most appropriate initial course of action for this patient?

- A. Endometrial biopsy
- B. Laparoscopy
- C. Needle aspiration for cytology
- D. Papanicolaou test
- E. Serum CA-125 level

Submit

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- A. Endometrial biopsy (3%)
- B. Laparoscopy (26%)
- C. Needle aspiration for cytology (25%)
- D. Papanicolaou test (4%)
- E. Serum CA-125 level (40%)

Omitted  
Correct answer  
E

40%  
Answered correctly

03 secs  
Time Spent

03/26/2020  
Last Updated

Explanation

Ovarian cancer risk increases with age, particularly after menopause, and any ovarian mass in a postmenopausal patient requires investigation. Risk factors for this malignancy include age, use of fertility drugs, uninterrupted ovulation (eg, nulligravidity), and *BRCA* mutation. **Cancer antigen 125 (CA-125)** is a biomarker for **epithelial ovarian cancer**. Elevations are also caused by common gynecologic conditions (eg, leiomyomata, endometriosis) that are more likely present in premenopausal patients; therefore, the specificity of CA-125 levels is much greater in postmenopausal women.



Ovarian cancer risk increases with age, particularly after menopause, and any ovarian mass in a postmenopausal patient requires investigation. Risk factors for this malignancy include age, use of fertility drugs, uninterrupted ovulation (eg, nulligravidity), and *BRCA* mutation. **Cancer antigen 125 (CA-125)** is a biomarker for **epithelial ovarian cancer**. Elevations are also caused by common gynecologic conditions (eg, leiomyomata, endometriosis) that are more likely present in premenopausal patients; therefore, the specificity of CA-125 levels is much greater in **postmenopausal** women.

CA-125 levels are measured in conjunction with **pelvic ultrasonography** findings to categorize an ovarian mass as likely malignant or benign. This postmenopausal patient has no medical conditions that may cause a false elevation of CA-125, so measurement is the best next step to investigate the risk of malignancy for this ovarian cyst. CA-125 levels can also be used to monitor for recurrence of a proven malignancy after treatment.

In a postmenopausal patient, an elevated CA-125 level in the context of any adnexal mass is highly suspicious for malignancy. If the adnexal mass has no malignant features on ultrasound (eg, small size, simple cyst) and the CA-125 level is normal, the patient can be observed with periodic ultrasound, but observation without further workup is inappropriate in a postmenopausal patient. If there are suspicious features on ultrasound (eg, large mass, solid components, septations) and/or if the CA-125 level is elevated, the patient should undergo further imaging (eg, MRI, CT scan) to assess the extent of disease. Knowledge of the presence of metastatic implants from imaging is important to guide surgical exploration (**Choice B**), which is recommended if malignancy is suspected based on clinical, CA-125, and imaging findings.

**(Choice A)** Endometrial biopsy is performed to investigate for endometrial carcinoma and is indicated in patients with postmenopausal bleeding, abnormal uterine bleeding over age 45, or thickened endometrial stripe with an ovarian mass. These findings are absent in this patient.

**(Choice C)** Needle aspiration is contraindicated in postmenopausal women with an adnexal mass due to risk of spreading potentially malignant cells should the mass prove cancerous.

**(Choice D)** Papanicolaou testing is a screen for cervical cancer and is not diagnostic of ovarian cancer. A distant history of an abnormal test does not increase ovarian cancer risk, and this test is not indicated in a workup of an adnexal mass.

**Educational objective:**

Ovarian cancer risk increases after menopause, and an ovarian mass in a postmenopausal patient is highly concerning for malignancy.

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#### Educational objective:

Ovarian cancer risk increases after menopause, and an ovarian mass in a postmenopausal patient is highly concerning for malignancy. Investigation by pelvic ultrasonography and CA-125 measurement is necessary. Even if the mass has no malignant features on ultrasound, an elevated CA-125 level is concerning and requires further imaging and possible surgical exploration.

#### References

- [The value of ultrasound monitoring of adnexal masses for early detection of ovarian cancer.](#)
- [Adnexal masses: characterization and imaging strategies.](#)

A 34-year-old nulligravid woman comes to the office for evaluation of abdominal pain. For the last 3 months, the patient has had intermittent abdominal cramping but no nausea, vomiting, or changes in bowel patterns. She stopped taking her combined oral contraceptives 6 months ago to try for pregnancy. Since then, her menses have occurred monthly with 5 days of moderate bleeding. The patient's mother had a hysterectomy at age 30 for heavy menstrual bleeding, and her paternal grandmother had breast cancer at age 64. BMI is 24 kg/m<sup>2</sup>. Vital signs are normal. Pelvic examination reveals a palpable right adnexal mass. On ultrasound, there is a 4-cm right adnexal mass that appears thin-walled and has multiple irregular, thickened internal septations. The left ovary appears normal, and there is no free fluid in the pelvis. Urine pregnancy test is negative. Which of the following features indicates a need for additional evaluation in this patient?

- A. Adnexal mass size
- B. Associated symptoms
- C. Contraceptive history
- D. Family history
- E. Mass internal features
- F. Parity

Submit

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- A. Adnexal mass size (4%)
- B. Associated symptoms (4%)
- C. Contraceptive history (0%)
- D. Family history (4%)
- E. Mass internal features (83%)
- F. Parity (1%)

Omitted

Correct answer

E



83%

Answered correctly



01 sec

Time Spent



03/01/2020

Last Updated

Explanation

Epithelial ovarian carcinoma	
<b>Clinical presentation</b>	<ul style="list-style-type: none"> <li>• Asymptomatic: incidental adnexal mass</li> <li>• Subacute: pelvic/abdominal pain, bloating, early satiety</li> <li>• Acute: dyspnea, obstipation/constipation, abdominal distension</li> </ul>
<b>Risk factors</b>	<ul style="list-style-type: none"> <li>• Family history</li> <li>• Genetic mutations (<i>BRCA1</i>, <i>BRCA2</i>)</li> <li>• Age <math>\geq 50</math></li> <li>• Hormone replacement therapy</li> <li>• Endometriosis</li> <li>• Infertility</li> <li>• Early menarche/late menopause</li> </ul>
<b>Protective factors</b>	<ul style="list-style-type: none"> <li>• Oral contraceptives</li> <li>• Multiparity</li> <li>• Breastfeeding</li> </ul>
<b>Laboratory findings</b>	<ul style="list-style-type: none"> <li>• <math>\uparrow</math> CA-125</li> </ul>
<b>Ultrasound findings</b>	<ul style="list-style-type: none"> <li>• Solid, complex mass</li> <li>• Thick septations</li> <li>• Ascites</li> </ul>
<b>Management</b>	<ul style="list-style-type: none"> <li>• Surgical exploration</li> <li>• <math>\pm</math> Chemotherapy</li> </ul>

**Adnexal masses** are common in premenopausal women and may cause symptoms (eg, pain, pressure) or be found incidentally on examination. Most premenopausal adnexal masses are benign, but all require evaluation for malignancy. Initial evaluation is with **pelvic ultrasound**, which provides optimal visualization of adnexal mass size and features. Ultrasound findings can increase or decrease the clinical **suspicion for**

- ± Chemotherapy

**Adnexal masses** are common in premenopausal women and may cause symptoms (eg, pain, pressure) or be found incidentally on examination. Most premenopausal adnexal masses are benign, but all require evaluation for malignancy. Initial evaluation is with **pelvic ultrasound**, which provides optimal visualization of adnexal mass size and features. Ultrasound findings can increase or decrease the clinical **suspicion for malignancy**. Patients with a low clinical suspicion for malignancy (eg, simple, fluid-filled ovarian cyst) are typically managed expectantly (eg, observation and repeat examination in 6 weeks).

In contrast, malignant adnexal masses are characterized by disordered, uncontrolled tissue proliferation. Therefore, they often have a **complex appearance** (ie, cystic and solid) with **abnormal internal features** such as **irregular, thickened septations** or papillary projections. Patients with these adnexal mass findings **require further evaluation** (eg, additional imaging, surgery).

**(Choice A)** Adnexal mass size alone is not predictive of malignancy because benign masses (eg, mucinous cystadenomas) can also be significantly enlarged. However, rapid interval growth on repeat imaging may suggest malignancy.

**(Choice B)** Associated symptoms concerning for malignancy include chronic (>6 months) or worsening pelvic pain, mass symptoms (eg, bloating, distension), and gastrointestinal symptoms (eg, changes in bowel patterns), which are not seen in this patient.

**(Choices C and F)** The risk of epithelial ovarian cancer correlates with the number of lifetime ovulatory cycles. Ovulation causes tissue trauma to the ovarian surface epithelium, thereby rendering it susceptible to potential malignant transformation. Fewer lifetime ovulatory cycles (eg, use of combined oral contraceptives), as in this patient, decreases the risk of ovarian cancer. Although multiparity would further decrease this patient's risk of ovarian cancer, nulliparity alone is not a significant risk factor and does not warrant additional evaluation.

**(Choice D)** Although family history and genetic mutations (eg, *BRCA*) are risk factors for ovarian cancer, having an affected second-degree relative (eg, grandmother with postmenopausal breast cancer) does not warrant further evaluation.

#### Educational objective:

In the evaluation of an adnexal mass, ultrasound findings concerning for ovarian malignancy include complex appearance and abnormal internal features (eg, irregular thickened septations, papillary projections). Patients with these suspicious adnexal mass findings require further evaluation.

#### References