

## Pelvic Mass: Review Questions

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### QUESTIONS

Choose the single best answer for each question.

#### Questions 1 to 3 refer to the following case.

A 67-year-old Caucasian woman who had been in good health until approximately 6 months ago presents to her primary care physician with increased abdominal discomfort, persistent “fullness,” and early satiety. Over the past 2 months, the patient has had gradual worsening of these complaints, and she has developed progressive abdominal distention to the extent that her slacks no longer fit. The patient denies significant past medical or surgical diseases. She underwent menopause at age 55 years, and she has no past history of disorders of pregnancy or gynecologic diseases. The patient’s mother had ovarian cancer, and one of the patient’s aunts also had a gynecologic malignancy. The patient is married, has 2 daughters, and is a smoker (1 pack/day). Examination of the abdomen shows obvious abdominal distention. A fluid wave is present, with shifting dullness. No masses are appreciated. Rectovaginal examination demonstrates a large, firm mass in the right adnexa and nodularity in the cul-de-sac. The limits of the mass cannot be fixed. A chest radiograph shows a small, right-sided pleural effusion. A computed tomography (CT) scan reveals a 12-cm mass of heterogeneous texture in the right ovary. A large number of ascites is present. The patient is informed that she most likely has an ovarian malignancy.

**1. What type of ovarian cancer is most common in this patient’s age-group?**

- (A) Dysgerminoma
- (B) Endodermal sinus tumor
- (C) Epithelial ovarian cancer
- (D) Mature teratoma

**2. What is the primary treatment for this type of ovarian cancer?**

- (A) Chemotherapy
- (B) Gamma knife radiotherapy
- (C) Surgery with tumor debulking followed by chemotherapy
- (D) Tandem and ovoid placement with external beam radiation

**3. What fact in this patient’s history is associated with an increased lifetime risk of ovarian cancer?**

- (A) Having 2 daughters
- (B) Mother with ovarian cancer
- (C) Smoking history
- (D) Symptom onset of 6 months

#### Questions 4 and 5 refer to the following case.

An 18-year-old woman is referred to a gynecologist after multiple presentations to her primary care provider with “pelvic pain and cramping.” She relates a regular 28-day menstrual cycle with 3 to 4 days of moderate to light menses. She also reports that the pelvic pain has been steadily increasing over the past 2 to 3 months, and she now feels pressure behind her bladder and has increased urinary frequency. Her work-up to date includes a negative urine pregnancy test and normal results on both urinalysis and urine culture. She had a recent Pap smear, which was normal, and gonorrhea and chlamydia screening were negative as well. She is not currently sexually active but uses condoms to protect herself from pregnancy and sexually transmitted diseases. A pelvic ultrasound shows an 8-cm mass in the left ovary with both cystic and solid components.

**4. What is the most likely diagnosis for this ovarian neoplasm?**

- (A) Ectopic pregnancy
- (B) Epithelial ovarian cancer
- (C) Hemorrhagic corpus luteum
- (D) Mature cystic teratoma

**5. If a cytogenetic analysis of the ovarian mass is performed, what would the resultant karyotype be?**

- (A) 45,X
- (B) 46,XX
- (C) 46,XY
- (D) 47,XXY

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6. During a routine pelvic examination, a 19-year-old woman is found to have “fullness” on her lower right pelvis. She denies pelvic pain or discomfort. A pelvic ultrasound is ordered and reveals a 4-cm unilocular, simple cyst on her right ovary. The uterus and left ovary are normal. What is the next step in the management of this patient?

- (A) CT of the abdomen and pelvis
- (B) Immediate surgical evaluation of the cyst via laparoscopy
- (C) Initiate oral contraceptive pills to help resolve the asymptomatic cyst
- (D) No immediate intervention; order a follow-up pelvic ultrasound in 6 to 8 weeks

7. A 14-year-old girl presents to the emergency department with a 1-day history of acute right lower pelvic pain. She is afebrile, and a urine pregnancy test is negative. An abdominal pelvic computed tomography CT scan shows a 6-cm right adnexal mass. Transvaginal ultrasound confirms a swollen right adnexa with absent blood flow to the right ovary. An ovarian torsion is suspected. What is the next step in the management of this patient?

- (A) Urgent surgical intervention with laparoscopy and plan to detorse or untwist the ovary and adnexa
- (B) Urgent surgical intervention with laparoscopy and plan to excise or remove the torsed adnexa and ovary
- (C) Urgent surgical intervention via laparotomy and plan to excise or remove the torsed adnexa and ovary
- (D) Admission to the hospital for observation and repeat transvaginal ultrasound in 6 hours

#### ANSWERS AND EXPLANATIONS

1. (C) **Epithelial ovarian cancer.** The incidence of epithelial ovarian cancer is age-related, and this cancer is generally a disease of postmenopausal women (median age of diagnosis, 63 yr).<sup>1</sup> Ovarian epithelial carcinoma is the leading cause of death from a gynecologic cancer in the United States, and there is an increasing mortality rate for women 65 years of age and older.<sup>2</sup> Ovarian epithelial cancers arise from the mesothelial layer, which covers the surface of the ovary. Endodermal sinus tumors, dysgerminomas, and mature teratomas are ovarian germ cell tumors, and they rarely occur after the third decade of life.

2. (C) **Surgery with tumor debulking followed by**

**chemotherapy.** Primary surgery in patients with ovarian epithelial cancers serves 3 purposes: diagnosis, staging, and debulking. Surgery establishes a tissue diagnosis and also determines the stage or extent of the disease. Several studies have demonstrated that patients with optimal cytoreductive surgery (largest diameter of remaining tumor implants  $\leq 1$  cm) have a better survival than patients with larger residual tumor implants.<sup>1</sup> The stage of disease and the effectiveness of cytoreduction (optimal versus nonoptimal) are major prognostic factors in patient survival. After optimal cytoreductive surgery, chemotherapy that includes a combination of paclitaxel and a platinum drug (either cisplatin or carboplatin) should be initiated. Chemotherapy is most frequently administered intravenously; however, based on data suggesting improved survival, intraperitoneal chemotherapy may also be administered directly into the peritoneal cavity.<sup>3</sup>

3. (B) **Mother with ovarian cancer.** Although the molecular events leading to the development of an ovarian epithelial carcinoma remain obscure, epidemiologic studies have identified family history as an important factor in determining an individual's risk for developing ovarian epithelial cancer. Compared with a lifetime risk of 1.6% (1 in 70 persons) in the general population, a woman with a single first-degree relative with ovarian carcinoma has an approximate 5% risk of developing the disease. Another risk factor for developing ovarian epithelial cancer is nulliparity. Conversely, the use of oral contraceptives reduces the risk of ovarian epithelial cancers. Use of the oral contraceptive for 5 years reduced the risk of ovarian epithelial cancers by about 50%.<sup>4</sup> Although the majority of ovarian epithelial cancers occur sporadically, approximately 10% occur as a result of a hereditary predisposition, such as a germline mutation in the *BRCA1* or *BRCA2* genes or from the hereditary nonpolyposis colorectal (Lynch II) syndrome.

4. (D) **Mature cystic teratoma.** Mature cystic teratoma is the most common ovarian neoplasm in adolescents. Its peak incidence is in the reproductive years and most appear in the first 2 decades of life. Mature cystic teratomas are composed of mature adult tissues from the germ cell layers of the ovary, and 90% are benign.<sup>5</sup> Mature cystic teratomas usually contain sebaceous material and hair, and 15% of lesions are bilateral. Malignant degeneration can occur in 1% to 2% of teratomas, usually in patients aged older than 40 years.

Hemorrhagic corpus luteum rarely grows larger than 6 cm and generally appears as a single large cyst with an internal echo pattern consistent with blood on ultrasound or CT. An epithelial ovarian cancer would be extremely rare in this age-group, and ectopic pregnancy is ruled out by the negative pregnancy test.

5. **(B) 46,XX.** Mature cystic teratomas are ovarian germ cell tumors that are diploid and have a normal 46,XX karyotype. They are thought to originate in the ovarian germ cell after the first meiotic division. The immature teratoma or malignant type of this tumor may have an aneuploid component similar to that of testicular germ cell tumors.
6. **(D) No immediate intervention, order a follow-up pelvic ultrasound in 6 to 8 weeks.** Simple ovarian cysts that are unilocular and less than 5 cm occur frequently in women of reproductive age. Most of these cysts arise and resolve without problem, and in women who are asymptomatic, no immediate intervention is required. Oral contraceptive pills are associated with a decreased incidence of developing ovarian cysts and thus are commonly initiated when a cyst has developed.<sup>6</sup> However, there is no evidence that initiating oral contraceptive pills helps to resolve cysts that are already present. Waiting 6 to 8 weeks and reimaging the pelvis and ovary is the recommended course in this asymptomatic patient.
7. **(A) Urgent surgical intervention with laparoscopy and plan to detorse or untwist the ovary and adnexa.** Ovarian torsion is a gynecologic emergency. Ideally, the patient should be taken for surgical evaluation as quickly as possible before torsion or compromise of adnexal blood supply leads to tis-

sue necrosis. The appearance of the adnexa and ovary at the time of surgery is generally darkened blue and white with cyanosis. The recommended course of action is laparoscopic management with untorsing and ovarian conservation.<sup>7,8</sup> This method has been demonstrated as safe by numerous studies of women with ovarian torsion. Excision of the affected ovary is unnecessary, and ovaries that appear necrotic at the time of surgery will generally remain viable if treated by untwisting in a timely manner.<sup>9</sup>

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