

## Lecture 7

# Polycystic Ovarian Disease & Endometriosis



*432 Pathology Team*

*Done By: Zaina Al-Sawah & Rawan Al-Quaiz*

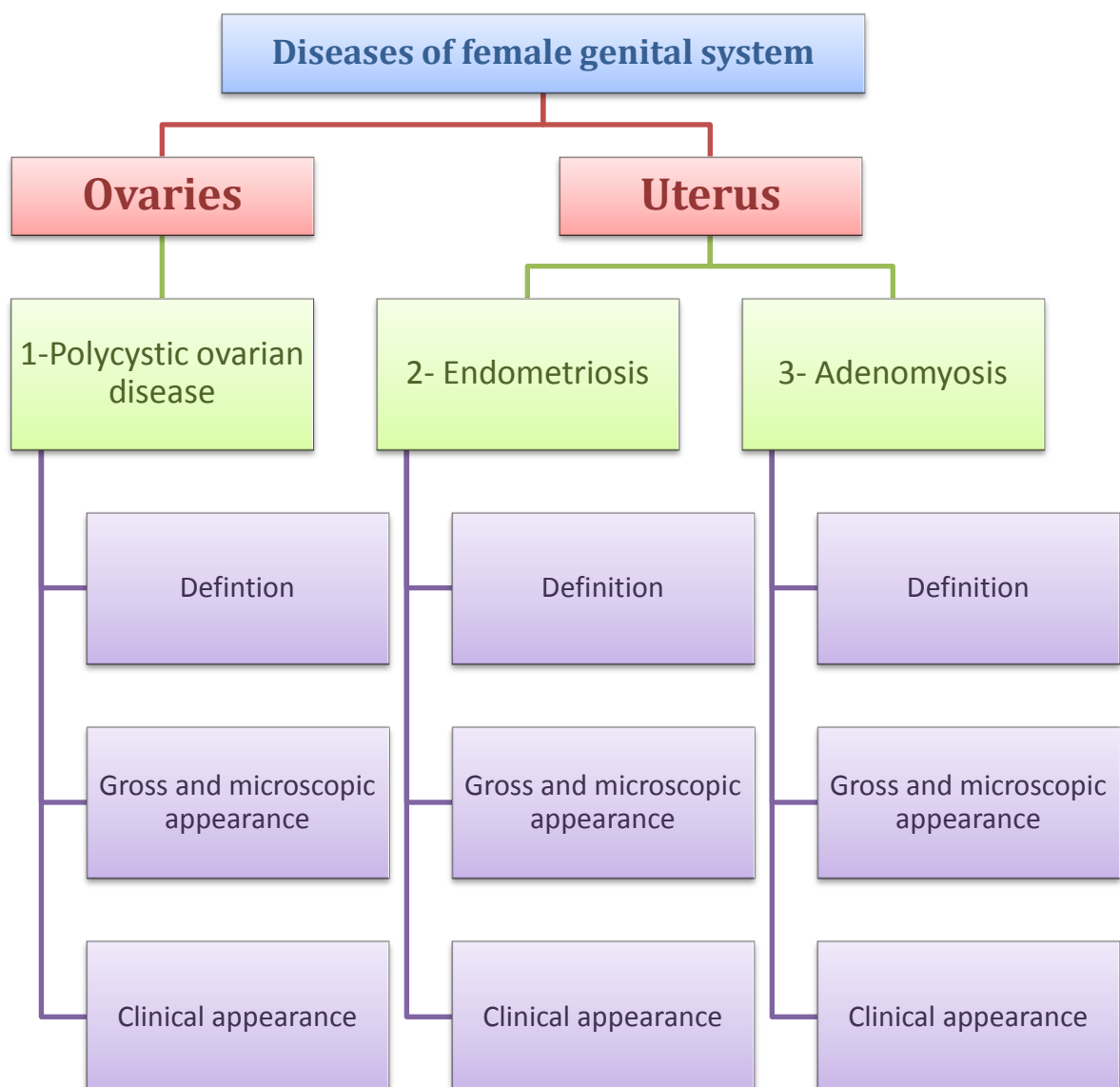
*Reviewed By: Ali Saeed*

*Reproductive Block*



# Polycystic Ovarian Disease & Endometriosis

## *Mind Map:*



# 1-Polycystic Ovarian Disease (PCOD)

## Definition:

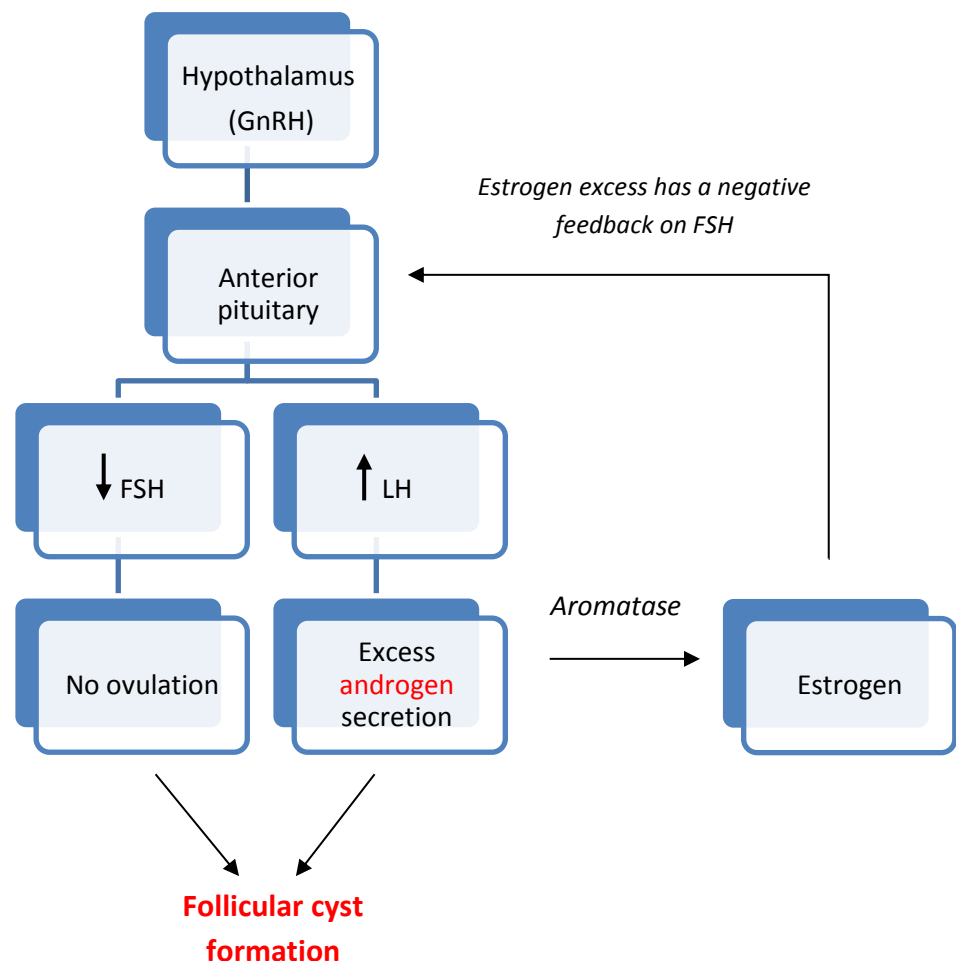
Polycystic ovaries are characterized by **bilaterally** enlarged polycystic ovaries, chronic anovulation and clinical manifestations secondary to excessive production of estrogens and androgens, **mainly androgens**.

Other names for this syndrome include: "*polycystic ovarian syndrome*" and "*Stein-Leventhal syndrome*".

## Cause of the disease:

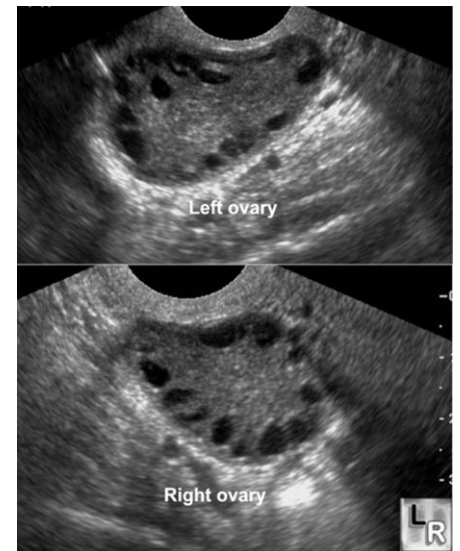
- Not known but is believed to be related to hypothalamus-pituitary dysfunction leading to **oversecretion of luteinizing hormone (LH)**. LH in turn stimulates the ovary to produce excess androgens.
- Secretion of **follicle stimulating hormone (FSH) is inhibited** resulting in repression of ovulation with follicle cyst formation.
- High level of **LH** and low **FSH**.

## In summary:



## Clinical appearance:

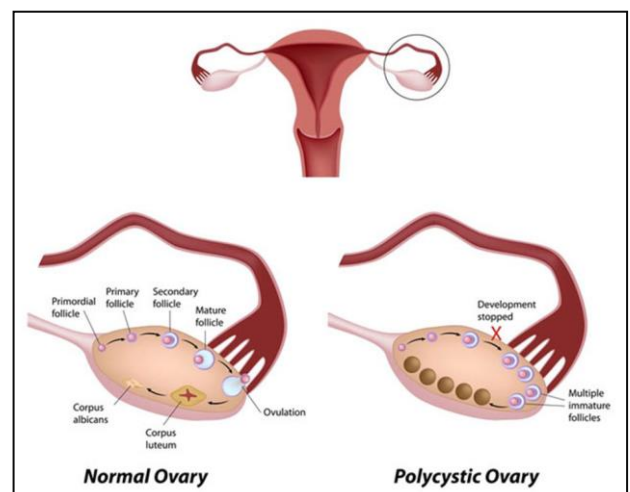
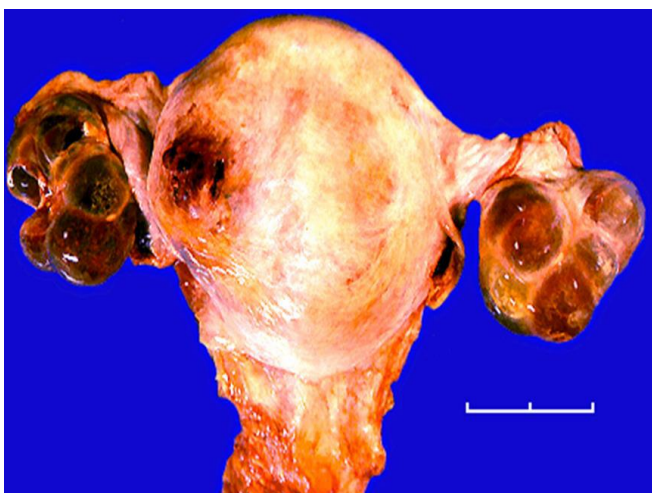
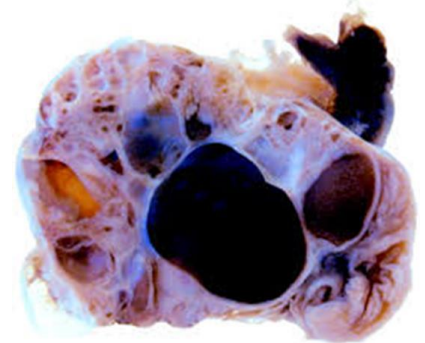
- Young woman (between 15 and 30 years)
- Secondary amenorrhea with anovulation (due to low FSH)
- Oligomenorrhea or irregular menses (due to excess androgens)
- Infertility
- Virilism and hirsutism due to excessive amounts or effects of androgenic (masculinizing) hormones
- Obesity
- Acne



**NOTE: Oligomenorrhea: infrequent or very light menstruation**

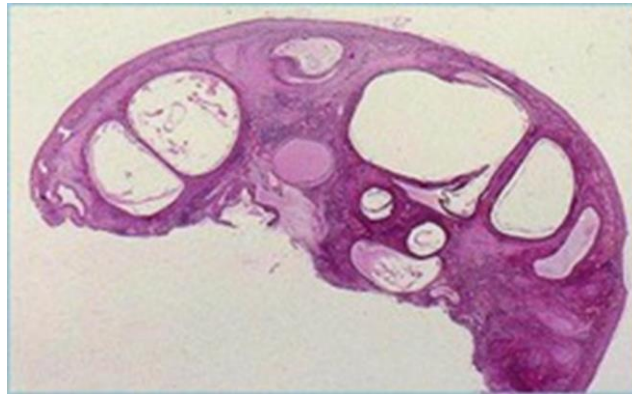
## Gross appearance:

- Bilateral
- Ovaries are enlarged usually twice the normal size
- Thickened, fibrotic, gray white capsule with smooth pearl-white outer surface, studded with sub-cortical cysts 0.5 to 1.5 cm in diameter.



## Histologic examination:

- The outer portion of the cortex is thickened and fibrotic (**cortical stromal fibrosis**).
- The cystic follicles are present in the sub-capsular cortex. They are lined **internally** by granulosa cells and **externally** by a prominent outer theca interna layer, which is often luteinized.
- Corpora lutea are frequently **absent** due to the anovulation. (**no ovum inside the follicle**)
- The chronic anovulation results in **unopposed estrogenic stimulation** of the endometrium leading to a variety of appearances ranging from mild atypical hyperplasia to well-differentiated endometrial adenocarcinoma.



## Treatment:

- Treatment with drugs that either **induce ovulation** (clomiphene or hCG) or **regulate the menstrual cycle** to restore fertility.
- In severe cases, reduction of ovarian volume by **wedge resection** (**taking out part of the ovary to reduce hormone levels**) is also successful in initiating ovulation and restoring fertility.
- The endometrial changes usually regress once ovulation is achieved.

## Women with PCOS are at risk for the following: (if untreated)

- Endometrial hyperplasia and endometrial cancer (due to high, unopposed levels of estrogen)
- Insulin resistance/Type II diabetes
- High blood pressure
- Depression/Anxiety
- Dyslipidemia
- Cardiovascular disease
- Strokes
- Weight gain
- Miscarriage
- Acanthosis nigricans (patches of darkened skin under the arms, in the groin area, on the back of the neck)
- Autoimmune thyroiditis

## 2-Endometriosis:

### Definition:

- The presence of ectopic endometrial glands and stroma **outside the endometrium of the uterus**. They are non-neoplastic (no malignant potential)
- The lesions are usually found on the peritoneal surfaces of the reproductive organs and adjacent pelvic organs.
- The most frequent location is the ovary (approx. 50%). Followed by the pouch of Douglas, uterine ligaments. Occasional sites include the cervix, vagina, perineum, bladder, large bowel and the umbilicus. Rare lesions are seen as far as small bowel, kidneys, lungs and brain.
- It has been reported in men. The sites involved have been the bladder, scrotum and prostate.
- Non-neoplastic.
- Like the uterine endometrium, it is responsive to the hormonal variations of the menstrual cycle. Meaning, the ectopic endometrial tissue bleeds during menstruation, resulting in blood filled areas. In case of endometriosis of the ovary, the blood will accumulate in the ovary creating a chocolate cyst.

## Clinical appearance:

- Clinical presentation depends on the site of endometriosis.
- Dysmenorrhea (cyclic abdominal pain) and dyspareunia are common symptoms.
- Often results in infertility (bleeding → inflammation → fibrosis → adhesions → distortion of the structure of the ovaries → infertility).

**NOTE: Dyspareunia:** painful sexual intercourse.

**Management of endometriosis of the ovary:** chocolate cysts must be excised. May recur after surgical excision but the risk is low.

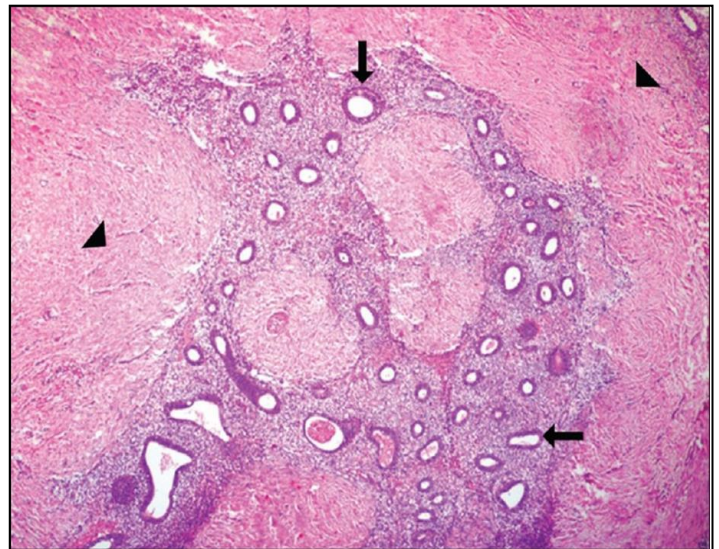
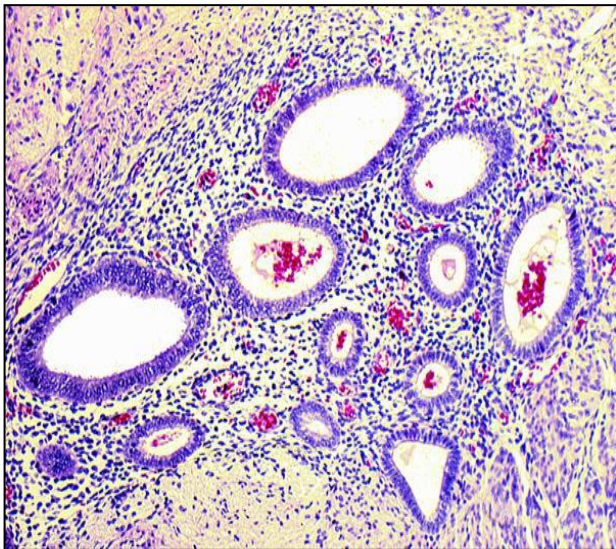
## Gross appearance:

- Endometriosis usually appears as multiple **red or brown nodules** (due to hemosiderin). They range in size from 1mm to 5mm or some may form larger masses or cysts.
- Dense fibrous adhesions may surround the foci.



## Histologic examination:

- The histologic diagnosis depends on finding **two of the following three features** within the lesions: endometrial glands, endometrial stroma, and  hemosiderin pigment.
- Macrophages containing hemosiderin (siderophages) may be present in lesions with previous hemorrhage.
- When endometriosis develops in a muscular viscus, the smooth muscle around it is often hyperplastic.



### **REMEMBER:** (Important!)

- Endometriosis is the presence of ectopic endometrial **glands** and **stroma** **outside the endometrium of the uterus**.
- **Most common location is the ovaries**
- Repeated hemorrhage into foci in the ovary with each menstrual cycle produces cysts, which contain thickened, chocolate-brown material, called "**chocolate cysts**" in which the ovaries turn into large cystic masses filled with brown fluid.

#### ❖ **Clinical behavior:**

- **Benign** with no malignant potential.
- May recur after surgical excision but the risk is low.



## 3-Adenomyosis:

### Definition:

- It refers to the growth of **the basal layer** of the endometrium down into the **myometrium**. Nests of endometrial stroma, glands, or both, are found deep in the myometrium interposed between the muscle bundles. The presence of endometrial tissue induces **reactive hypertrophy of the myometrium**.
- The condition involves **the posterior wall** more often than the anterior wall but it may affect both walls in the same uterus.

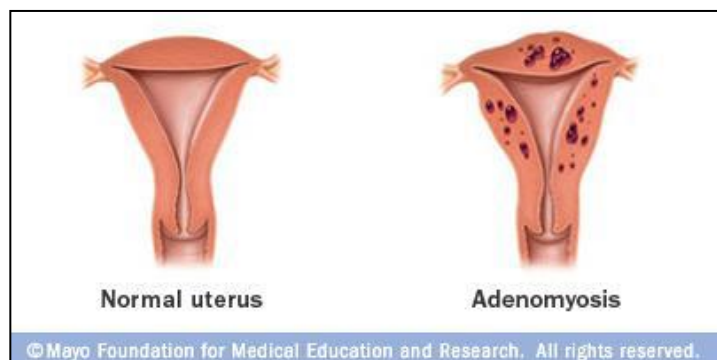
**NOTE:** Adenomyosis involves **the basal layer of the endometrium**, therefore **no cyclic bleeding occurs**. Unlike endometriosis, where **the functional (superficial) layer** is involved and goes through cyclic changes.

### Clinical appearance:

- The disease is primarily a disorder of parous women and occurs **infrequently** in the nullipara.
- Associated with **menorrhagia** and severe **dysmenorrhea**.
- In about a third of the patients there are no symptoms and the lesions are discovered accidentally.

### Gross appearance:

- The presence of endometrial tissue induces reactive hypertrophy of the myometrium, resulting in an **enlarged, globular** uterus, often with a **thickened uterine wall**.
- Within the thickened myometrium, there are small yellow or brown **cystic spaces** containing fluid or blood.



**Clinical behavior:**

- Occasionally, proliferation of smooth muscle around a focus of Adenomyosis produces a tumor called **adenomyoma** (benign), which resembles uterine leiomyoma.
- This is a **benign condition** with no known malignant potential that regresses after menopause.

**Summary from Robbins**

- Endometriosis refers to endometrial **glands** and **stroma** located outside the **endometrial lining of the uterus** and may involve the pelvic or abdominal peritoneum. Rarely, distant sites like the lymph nodes and the lungs also are involved.
- The ectopic endometrium in endometriosis undergoes cyclic bleeding, and the condition is a common cause of dysmenorrhea and pelvic pain.
- Adenomyosis refers to growth of endometrium into the myometrium with uterine enlargement. Unlike with endometriosis, there is **no** cyclic bleeding.

# Summary

	Grossly	Microscopically	Clinical appearance
PCOD	<ul style="list-style-type: none"> <li>-Bilateral</li> <li>-Enlargement of ovaries</li> <li>-Subcortical cysts</li> </ul>	<ul style="list-style-type: none"> <li>- Corticalstromal fibrosis</li> <li>- Cystic follicles lined by granulosa cells</li> <li>- Hyperplastic luteinized theca interna</li> <li>- Absence of corpora lutea</li> </ul>	<ul style="list-style-type: none"> <li>-Young woman</li> <li>-Virilism and hirsutism</li> <li>-Oligomenorrhea</li> <li>-Secondary amenorrhea</li> <li>-Acne</li> <li>-Obesity</li> </ul>
Endometriosis	<ul style="list-style-type: none"> <li>-Blood filled cysts "chocolate cyst"</li> <li>-Dense fibrous adhesions may surround the foci.</li> </ul>	<ul style="list-style-type: none"> <li>- Endometrial glands</li> <li>- Endometrial stroma</li> <li>- Hemosiderin laden macrophages</li> </ul>	<ul style="list-style-type: none"> <li>- Dysmenorrhea</li> <li>-Dyspareunia</li> <li>-Infertility</li> </ul>
Adenomyosis	<ul style="list-style-type: none"> <li>- Hypertrophy of the myometrium</li> <li>-Enlarged globular uterus with a thickened wall</li> <li>-Yellow or brown cystic spaces containing fluid or blood</li> </ul>	<p>Nests of endometrial stroma, glands, or both are found deep in the myometrium interposed between the muscle bundles</p>	<ul style="list-style-type: none"> <li>-Parous women</li> <li>- Menorrhagia</li> <li>- Dysmenorrhea</li> </ul>

# Questions

1/ A 40-year-old woman presents with a 5-year history of dysmenorrhea. Physical examination and endocrine studies are normal. A hysterectomy is performed. Histologic examination of the uterine wall reveals areas of extensive adenomyosis. Which of the following best describes this patient's uterine pathology?

- (A) Benign neoplasm of glandular epithelial cells
- (B) Displacement of endometrial glands and stroma
- (C) Endometrial intraepithelial neoplasia
- (D) Hyperplasia of trophoblast as a sequel of incomplete abortion

2/ A 25-year-old woman is referred to the gynecologist for treatment of infertility. The patient is obese (BMI = 32 kg/m<sup>2</sup>) and has pronounced facial hair. She states that she has always had irregular menstrual periods. On gynecologic examination, both ovaries are found to be symmetrically enlarged. This patient's ovaries would likely show which of the following pathologic findings?

- (A) Bilateral endometriomas
- (B) Cystic teratoma
- (C) Mucinous cystadenoma
- (D) Subcapsular cysts

3/ Endocrine studies of the woman described in Question 2 would most likely show which of the following results in the serum?

- (A) High levels of corticosteroids
- (B) High levels of follicle-stimulating hormone
- (C) High levels of luteinizing hormone
- (D) Low levels of estrogens

Answers:

- 1- B
- 2- D
- 3- C

اللهم إني استودعك ما قرأت و ما حفظت و ما تعلمت فرده عليّ عند حاجتي إليه انك على كل شيء قدير

If there is any mistake or feedback please contact us on: [432PathologyTeam@gmail.com](mailto:432PathologyTeam@gmail.com)

