

# Endometriosis and polycystic ovarian disease

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REFERENCE: ROBBINS & COTRAN PATHOLOGY AND RUBIN'S  
PATHOLOGY

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# Lecture outline: Endometriosis and polycystic ovarian disease.

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At the end of this lecture, the student should be able to:

- A] Know the clinicopathological features of endometriosis with special emphasis on: definition, typical sites and theories behind its pathogenesis.
- B] Understand the clinical manifestations and pathologic features of polycystic ovarian disease.

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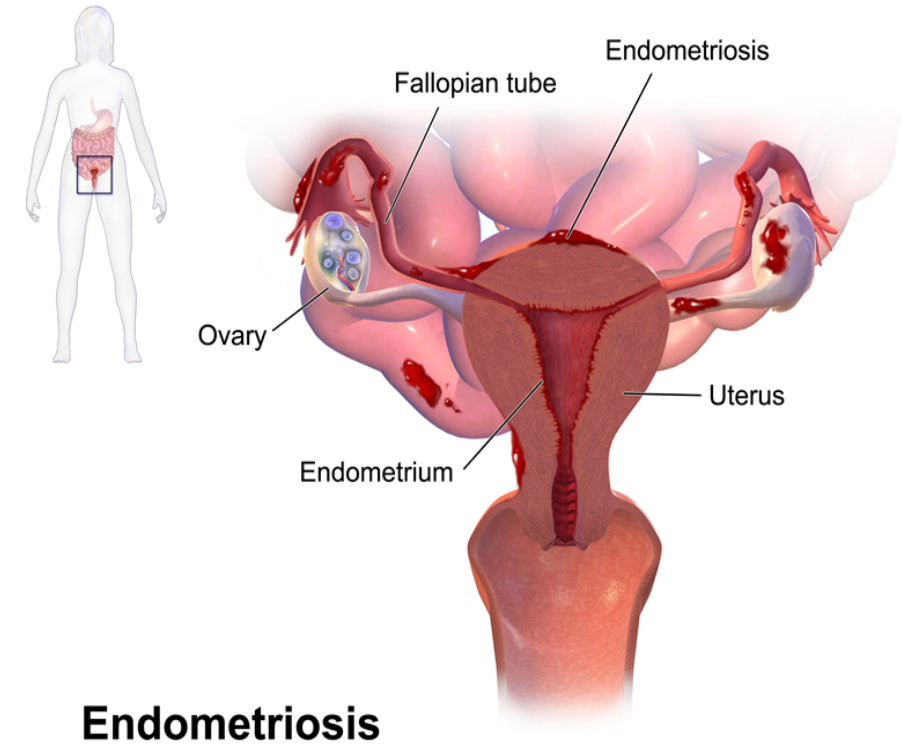
# Endometriosis

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# Endometriosis

Normally endometrial glands and endometrial stroma are found in the endometrium of the uterus.

Endometriosis is the presence of ectopic endometrial glands and stroma outside the uterus.



**Endometriosis**

# Endometriosis

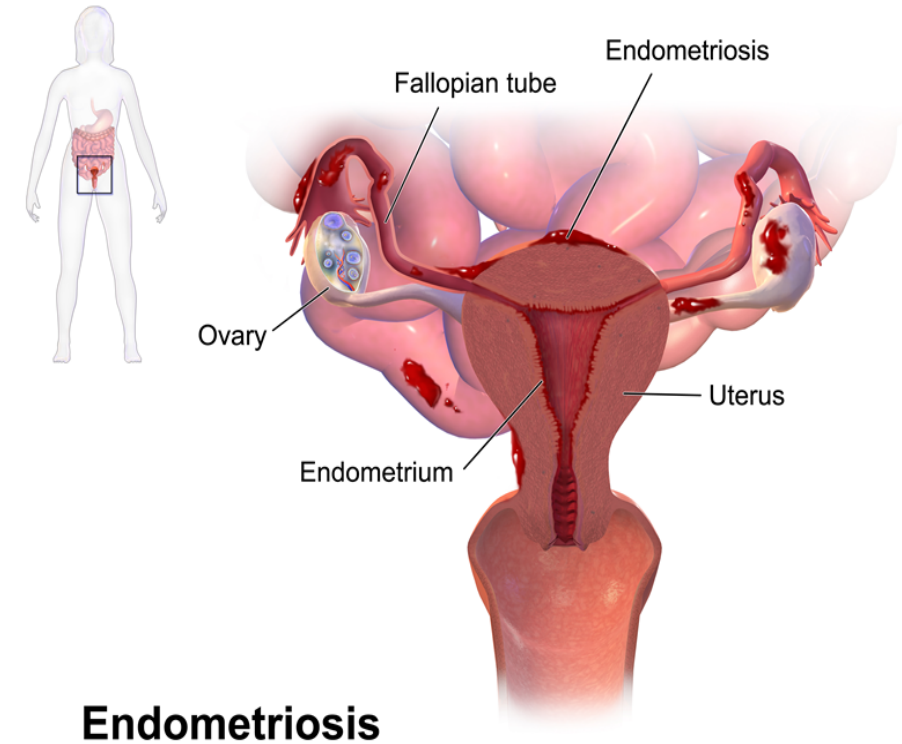
Endometriosis is usually found on the peritoneal surfaces of the reproductive organs and adjacent pelvic organs. The most frequent location is the

- **ovary (approx. 50%).**
- **pouch of Douglas/ rectouterine pouch/ cul- de- sac and uterine ligaments.**
- **occasionally: in cervix, vagina, perineum, bladder, large bowel and umbilicus.**
- **rarely: in small bowel, kidneys, lungs.**

It is non-neoplastic..

Like the uterine endometrium it is responsive to the hormonal variations of the menstrual cycle, and bleeds during menstruation.

Therefore in endometriosis there is menstrual type bleeding at the site of the ectopic endometrium, resulting in blood filled areas (e.g. **chocolate cysts**).

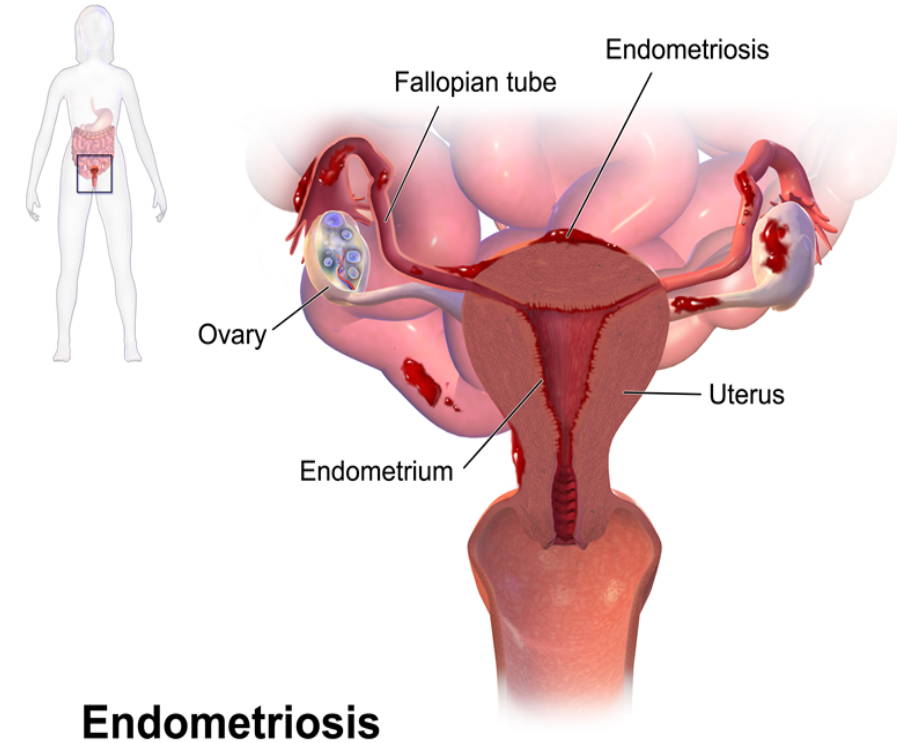


**Endometriosis**

# Endometriosis

Proposed theories:

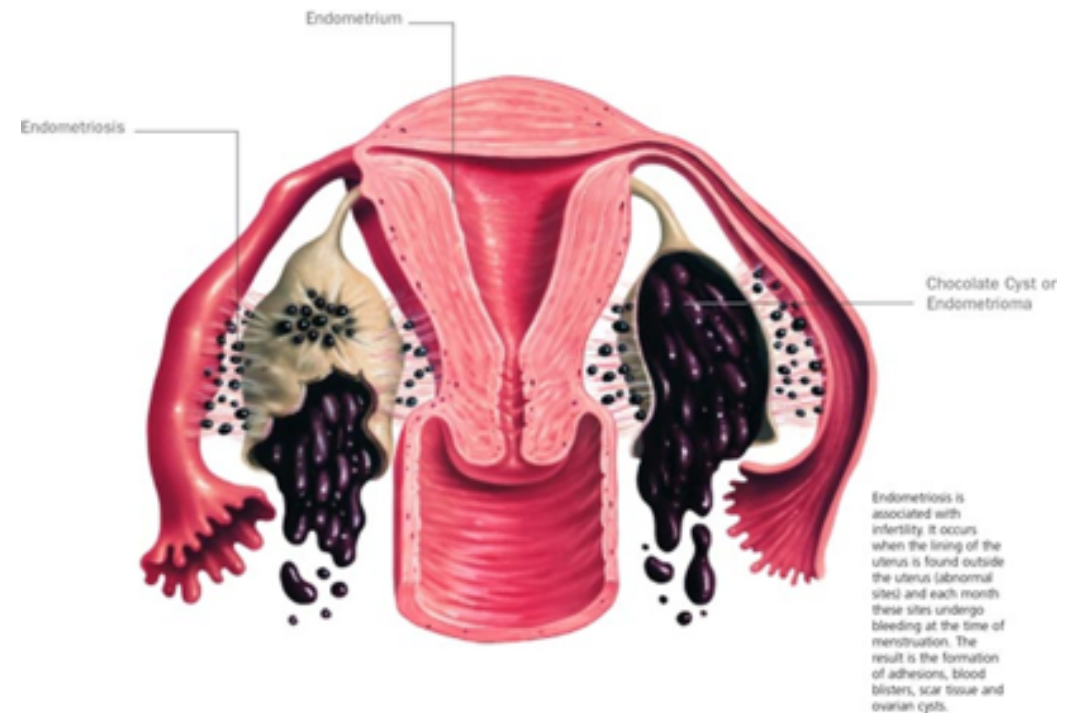
- Metastatic: retrograde menstruation and implantation of endometrial cells.
- Metaplastic: due to metaplasia of pelvic peritoneal cells.



**Endometriosis**

# Endometriosis: Clinical features

- ▶ Clinical features depends on the site of endometriosis.
- ▶ Dysmenorrhea (painful menstruation), cyclic abdominal pain.
- ▶ Women in active reproductive life.
- ▶ Often results in infertility.



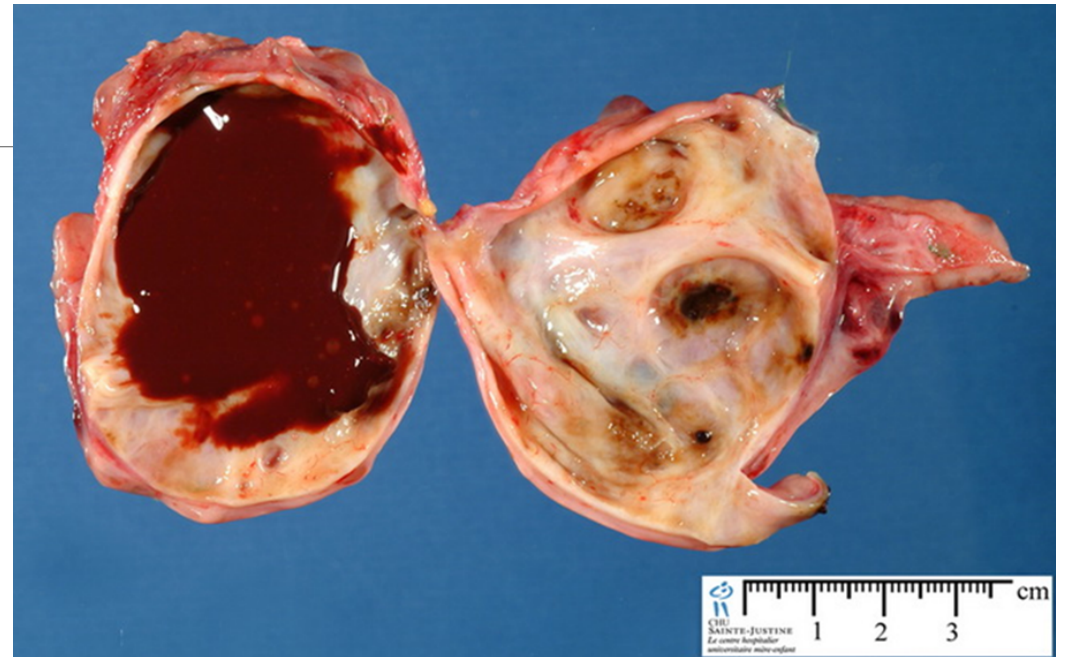
<http://www.coastalivf.com.au/images/endometriosis.jpg>

# Endometriosis

Repeated hemorrhage into the ovary with each menstrual cycle produces cysts, filled with chocolate-brown material. The cyst is called "**chocolate cyst**". With time the ovaries become totally cystic and turn into large cystic masses filled with chocolate brown fluid.

## Clinical behavior:

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



**Chocolate cyst of ovary (endometriotic cyst)**

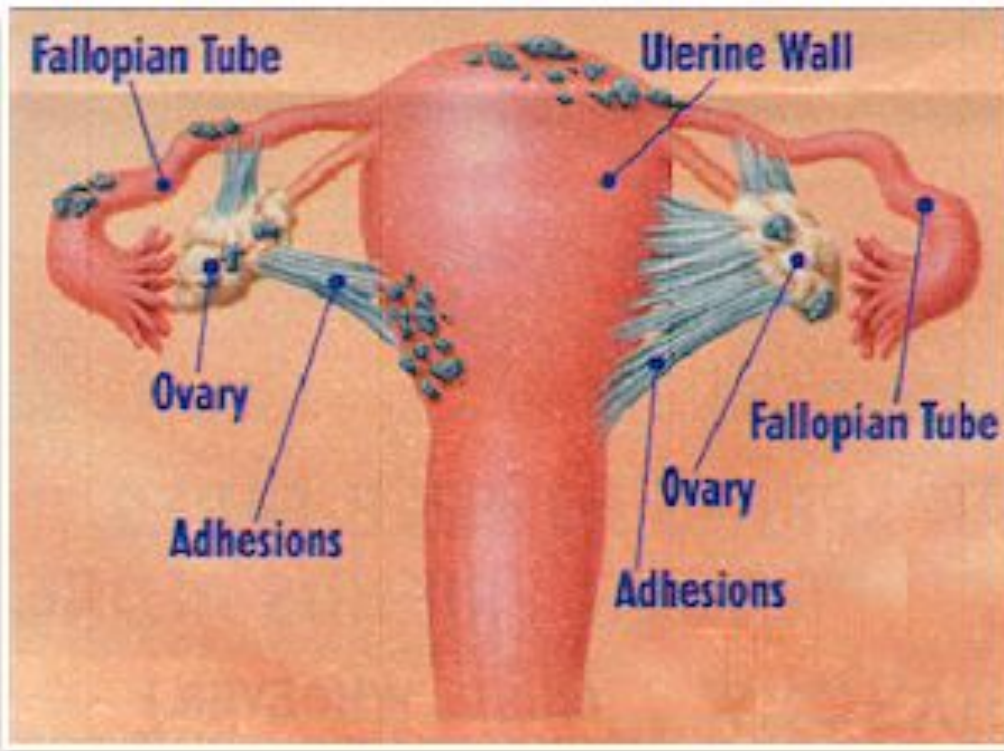
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# Endometriosis, complications

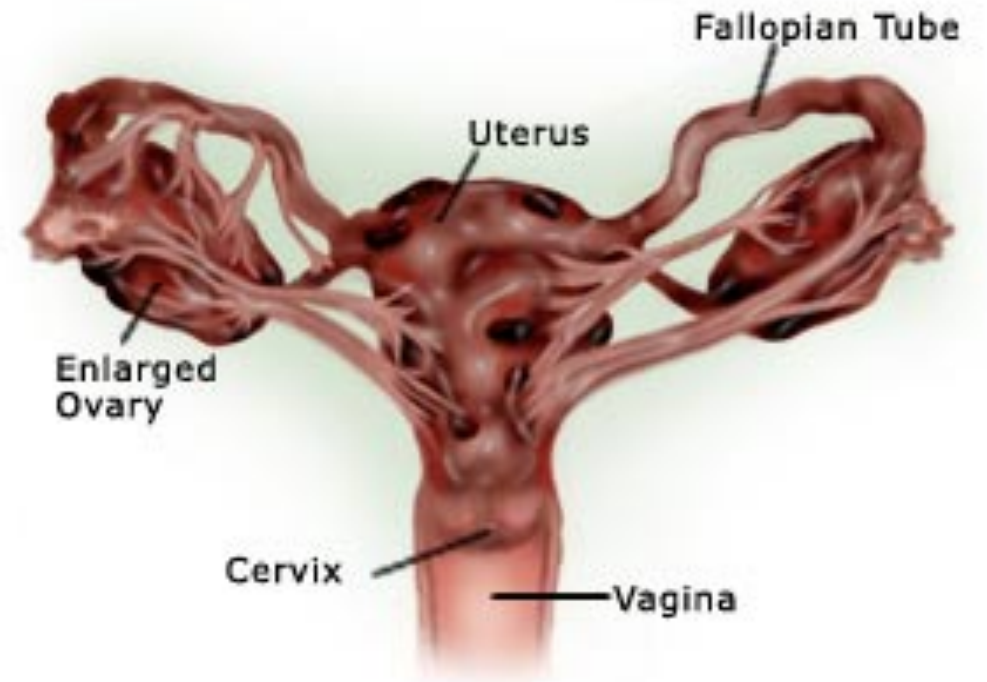
Infertility

Adhesions



<http://longstoryshortgirl.com/wp-content/uploads/2014/08/causes-of-endometriosis-cyst.jpg>

Advanced Endometriosis



<http://longstoryshortgirl.com/wp-content/uploads/2014/08/causes-of-endometriosis-cyst.jpg>



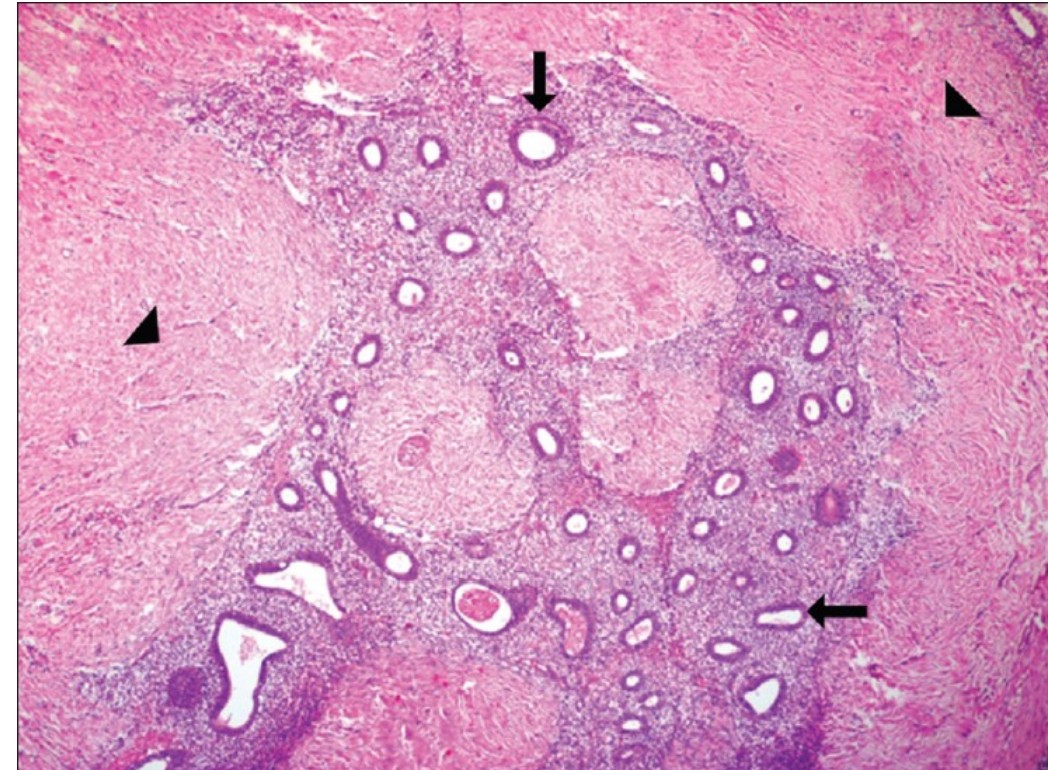
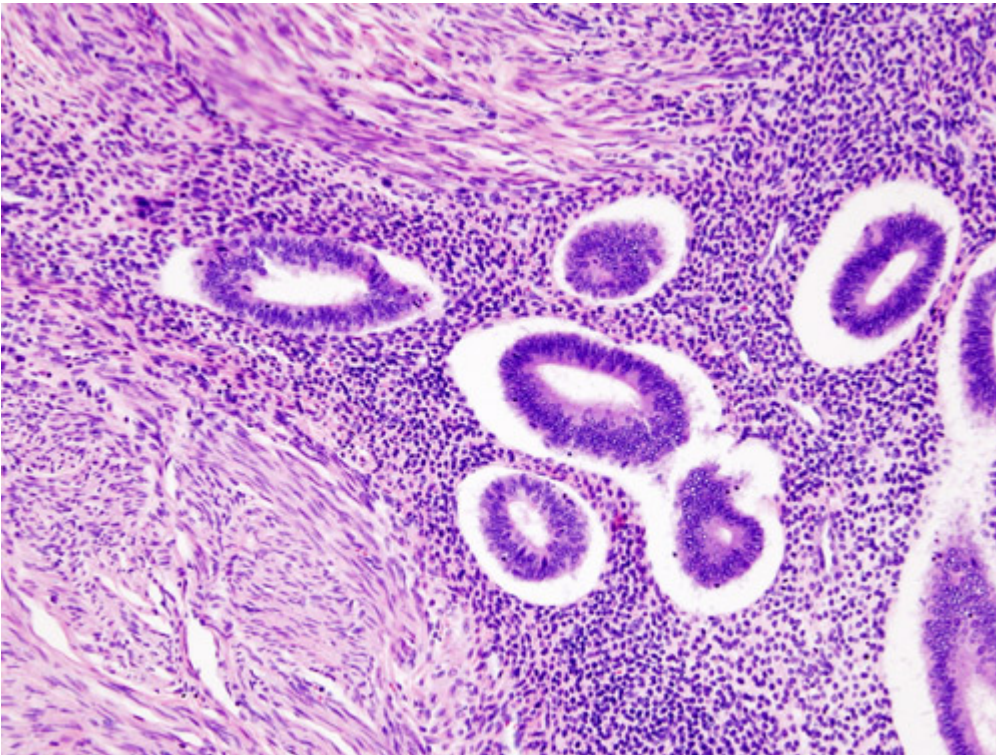
# Endometriosis histology

Ectopic **endometrial glands** and endometrial **stroma** are present.

Denatured blood from previous bleeding is present.

**Macrophages containing hemosiderin** (siderophages) are present.

When endometriosis develops in a muscular organ, the smooth muscle around it is often hyperplastic.



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# Adenomyosis

# Adenomyosis

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This is defined as the presence of **endometrial glands and endometrial stroma in the myometrium** of the uterus.

It is more common in the posterior wall than the anterior wall (but it may affect both walls in the same uterus).

The disease is primarily a disorder of parous women and is uncommon in the nulliparous.

It is associated with menorrhagia and severe dysmenorrhea. In 1/3rd of the patients: there are no symptoms.

When extensive → the lesions cause → myometrial thickening with small yellow or brown cystic spaces containing fluid or blood.

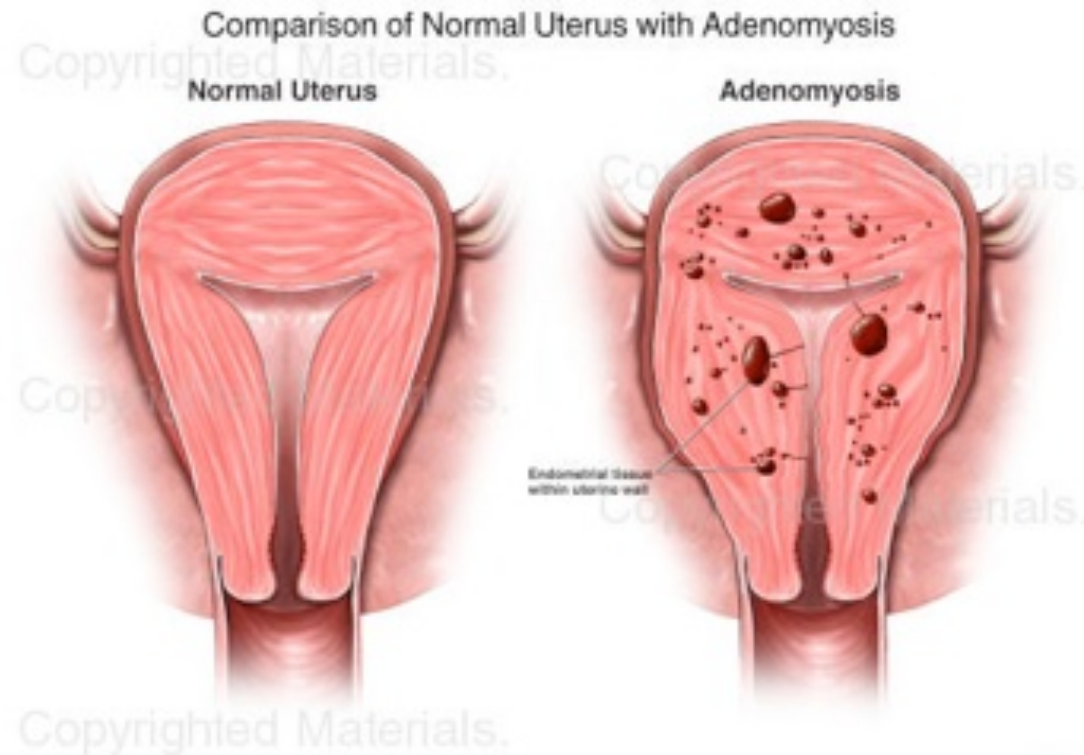
## **Clinical behavior.**

This is a benign condition with no known malignant potential that regresses after the menopause



# Adenomyosis

CROSS SECTION THROUGH THE WALL OF A HYSTERECTOMY SPECIMEN OF A 30-YEAR-OLD WOMAN WHO REPORTED CHRONIC PELVIC PAIN AND ABNORMAL UTERINE BLEEDING. THE ENDOMETRIAL SURFACE IS AT THE TOP OF THE IMAGE, AND THE SEROSA IS AT THE BOTTOM



<http://www.paroleauxjeunes.fr/wp-content/uploads/2013/11/adenomyose.jpg>



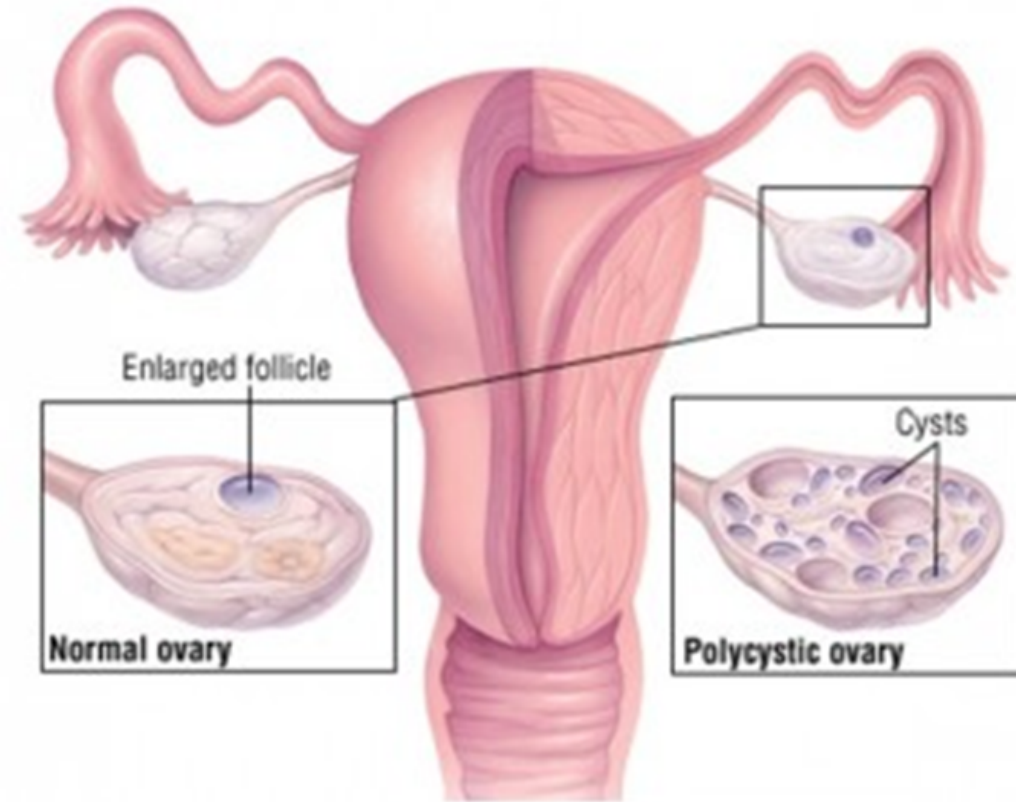
"Adenomyosis, Hysterectomy Specimen" by Ed Uthman, MD - <http://www.flickr.com/photos/euthman/640264025/>. Licensed under CC BY-SA 2.0 via Wikimedia Commons - [http://commons.wikimedia.org/wiki/File:Adenomyosis,\\_Hysterectomy\\_Specimen.jpg#/media/File:Adenomyosis,\\_Hysterectomy\\_Specimen.jpg](http://commons.wikimedia.org/wiki/File:Adenomyosis,_Hysterectomy_Specimen.jpg#/media/File:Adenomyosis,_Hysterectomy_Specimen.jpg)

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# Polycystic ovarian disease

# Polycystic Ovarian Disease

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



# Polycystic Ovarian Disease

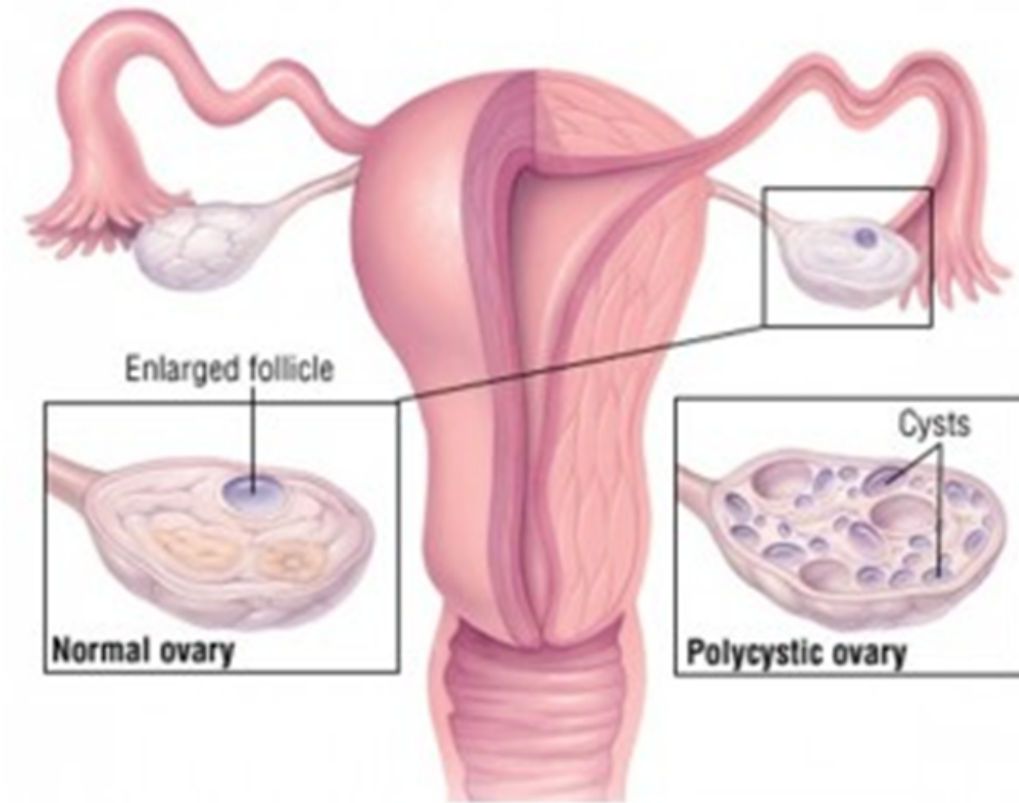
Polycystic ovaries are characterized by bilateral enlargement of ovaries by multiple small cysts, chronic anovulation and clinical manifestations secondary to excessive production of estrogens and androgens, mainly androgens.

The initial abnormality resulting in the syndrome is not known but is believed to be related to hypothalamus-pituitary dysfunction leading to **over secretion of luteinizing hormone (LH)**.

LH in turn stimulates the ovary to produce excess androgens. While the secretion of follicle stimulating hormone (FSH) is inhibited → leads to suppression of ovulation and formation of cystic follicles in the ovary.

Patients have:

- high levels of LH.
- low FSH.
- high testosterone.
- high estrogen.



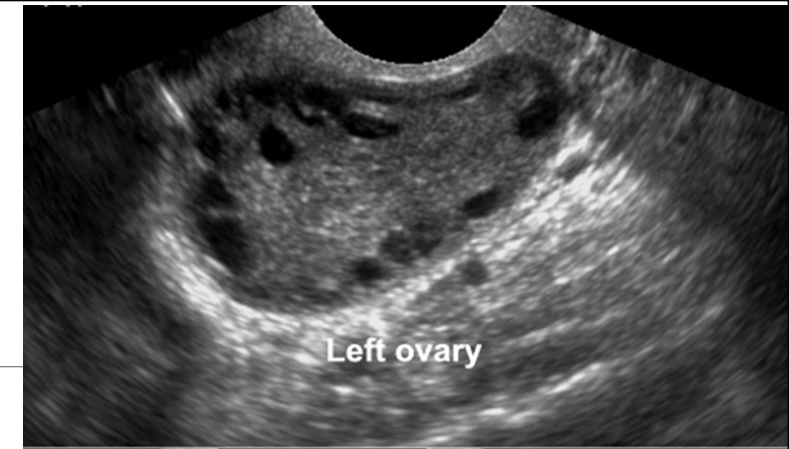


# Polycystic Ovarian Disease

## Clinical features.

Usually young women (between 15 and 30 years), present with:

- secondary amenorrhea with anovulation.
- oligomenorrhea or irregular menses.
- infertility.
- hirsutism.
- obesity.
- acne.

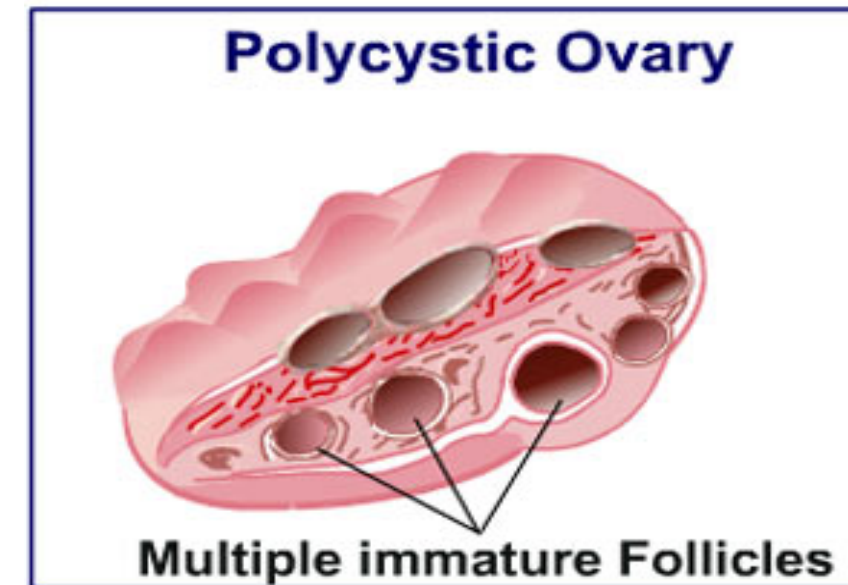
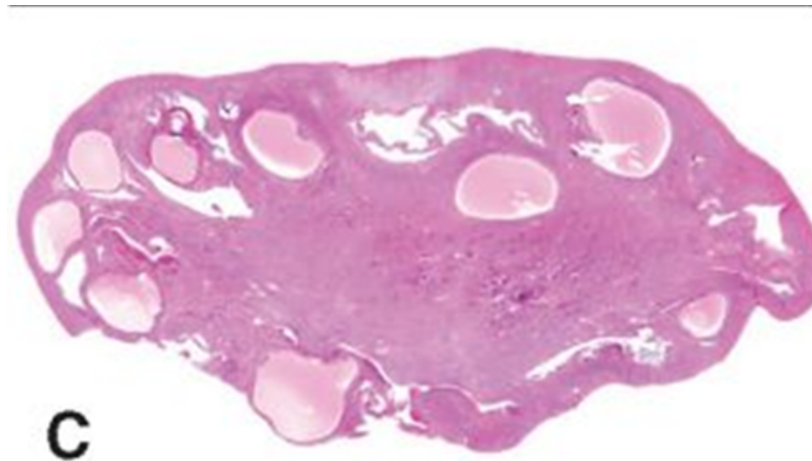
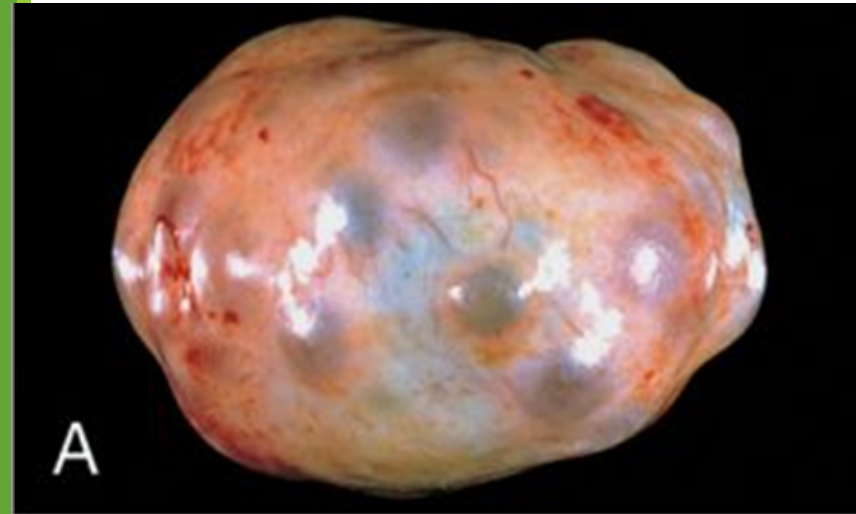


## Polycystic ovarian disease.

A: The ovarian surface reveals numerous nodular elevations of clear cysts.

B: Cut section shows several subcortical cystic follicles in the ovary.

C: Cystic follicles seen in a low-power microphotograph.



Picture Taken from Robbins and Cotran Pathologic basis of disease. 8<sup>th</sup> edition, Chapter 21, 2010 Sanders

# Polycystic Ovarian Disease

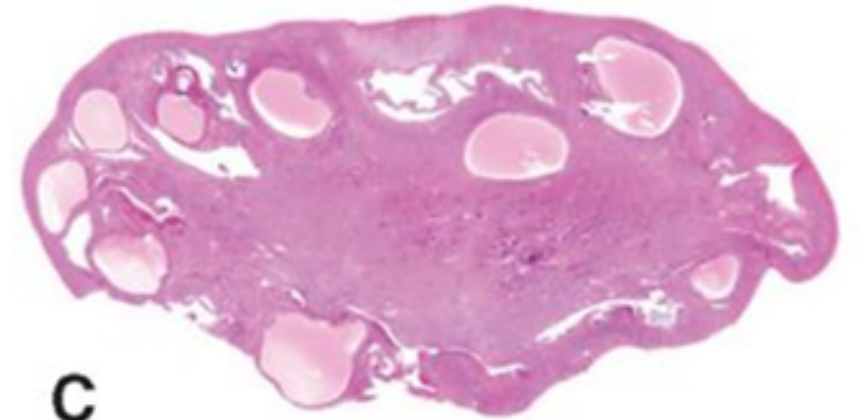
## Histology

### Ovaries:

- Ovaries are 2 times the normal size with many subcortical cysts measuring 0.5 to 1.5 cm in diameter.
- Microscopically, the outer portion of the cortex is thickened and fibrotic (cortical stromal fibrosis) with multiple cysts underneath. The follicular cysts usually have a prominent theca interna layer.
- Corpora lutea are frequently absent (because no ovulation, women with PCOD have anovulatory cycles).

### Endometrium:

- The chronic anovulation → unopposed estrogen → leads to a hyperestrogenic state → endometrium may develop estrogen associated hyperplasia and show any of the following:
  - hyperplasia, with or without atypia .
  - or even endometrial adenocarcinoma.



C

Picture Taken from Robbins and Cotran Pathologic basis of disease. 8<sup>th</sup> edition, Chapter 21, 2010 Sanders

# Polycystic Ovarian Disease

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## **Women with PCOD are at risk for the following:**

Endometrial hyperplasia and endometrial cancer.

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.

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## Treatment

Treatment with drugs that either induce ovulation (clomiphene or hCG) or regulate the menstrual cycle restores fertility.

Reduction of ovarian volume by wedge resection of the ovaries is also successful in initiating ovulation and restoring fertility.

The endometrial changes usually regress once ovulation is achieved.

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