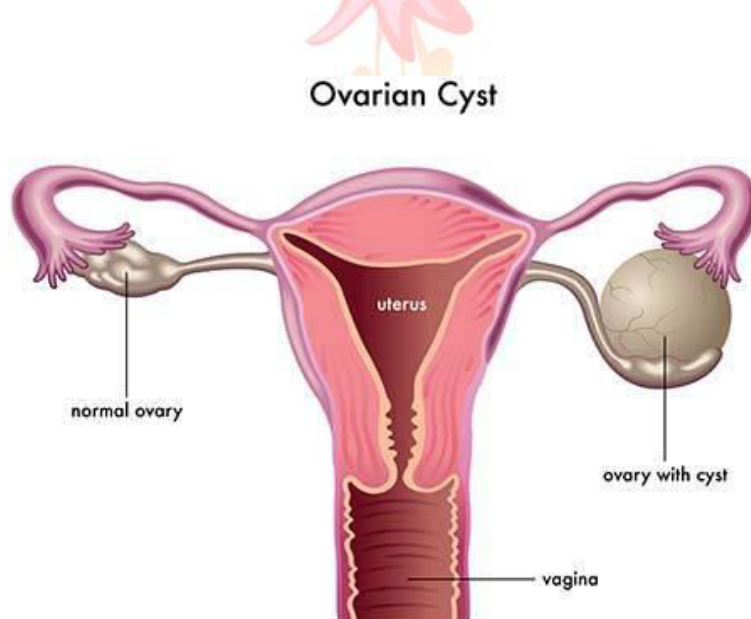


Benign diseases of the ovary

Most benign ovarian tumors will be diagnosed following investigation of women complaining of acute pelvic pain or chronic pelvic pain (CPP), or noticing the presence of an abdominal mass. They may also be found incidentally during a gynecological examination or pelvic ultrasound scan (USS).

The differential diagnosis of a pelvic mass:

- 1- Gynecological:** benign or malignant ovarian cyst; torsion; para-ovarian cyst; ectopic pregnancy ,hydrosalpinx ,pyosalpinx, tubo-ovarian abscess; tubal malignancy; pregnancy; fibroids; uterine malignancy.
- 2- Gastrointestinal:** small or large bowel obstruction; diverticular/appendicular abscess; intussusception; malignancy.
- 3-Urological:** hydronephrosis ; pelvic kidney; renal/bladder malignancy.
- 4- Other:** pelvic lymphocele; peritoneal cyst; psoas muscle abscess; lymphoma; neuroblastoma; aortic aneurism.



The presentation with the different types of benign ovarian tumors varies with age.

Functional cysts are common in young girls, adolescents and women in their reproductive years.

Germ cell tumors occur more commonly in young women, whereas benign epithelial tumors are more prevalent in older and postmenopausal women.

Types of benign ovarian cyst:

Functional	Follicular cyst Corpus luteal cyst Theca luteal cyst
Inflammatory	Tubo-ovarian abscess Endometrioma
Germ cell	Benign teratoma (dermoid cyst)
Epithelial	Serous cystadenoma Mucinous cystadenoma Brenner tumour
Sex cord stromal	Fibroma Thecoma

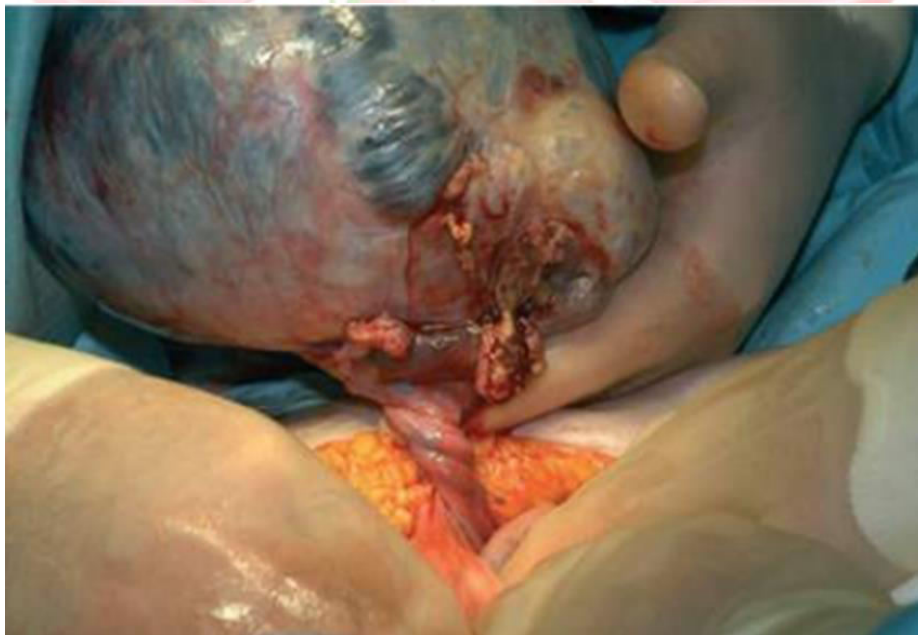
Ovarian torsion :

- Torsion of an ovary refers to a situation where there is rotation of the vascular pedicle supplying the ovary, which compresses and cuts its blood supply.

Torsion is more likely with enlargement of the ovary as is seen in the presence of an ovarian cyst. Up to 15% of dermoid cysts present acutely with torsion.

- Presenting symptoms are usually acute onset of lower abdominal pain associated with nausea and vomiting. Pelvic USS with Doppler measurement of blood flow may be useful in the diagnosis, to confirm the presence of a cyst and comment on blood flow to the ovary. Torsion of a normal ovary is very unlikely.
- Emergency surgical treatment to untwist the ovary and its attached pedicle is required to restore blood flow, and the ovarian cyst should then be removed. However, if this complication is not recognized within a few hours of presentation, infarction and gangrene may result, necessitating removal of the necrotic ovary.

Decision making to operate should be based on clinical findings, with transvaginal ultrasound scan (TVUSS) support.



Diagnosis of ovarian cyst :

Diagnosis may be made by symptoms of pelvic discomfort or pressure on the bladder or the bowel.

Acute pain may represent torsion of a cyst, rupture or hemorrhage into it. Abdominal and bimanual pelvic examination may elicit a pelvic/abdominal mass that may be tender and will be separate from the uterus.

Investigation :

- **Transvaginal ultrasound :**

The first-line investigation for women with a suspected pelvic mass or pelvic pain is an USS. A TVUSS has better resolution for pelvic masses.

A transabdominal ultrasound scan (TAUSS) is indicated in women who have never been sexually active, or in combinations with a TVUSS where large ovarian masses extending beyond the pelvis and into the abdomen are present.

- **Computed tomography (CT) scanning :**
- **magnetic resonance imaging (MRI):** can further characterize the nature of ovarian cysts, especially where they are thought to be potentially malignant.
- **Serological tumour markers :** should also be taken to help determine the type of ovarian cyst and differentiate between a benign and malignant neoplasm .
- **A pregnancy test :** should be performed to exclude pregnancy.
- **Inflammatory markers:** such as C-reactive protein (CRP) and white cell count (WCC), are important if the differential diagnosis includes appendicitis or a tubo-ovarian abscess.

Tumor markers used in the investigation and follow-up of ovarian cysts

Tumour marker	Ovarian tumour type	Uses
Ca 125	Epithelial ovarian cancer (serous), borderline ovarian tumours	Preoperative, follow-up
Ca 19-9	Epithelial ovarian cancer (mucinous), borderline ovarian tumours	Preoperative, follow-up
Inhibin	Granulosa cell tumours (type of sex cord stromal tumour)	Follow-up
β -hCG	Dysgerminoma, choriocarcinoma (germ cell tumours)	Preoperative, follow-up
AFP	Endodermal yolk sack, immature teratoma (germ cell tumours)	Preoperative, follow-up



Functional ovarian cysts :

This group of ovarian cysts includes follicular, corpus luteal and theca luteal cysts. The risk of developing functional cysts is reduced by the use of the combined oral contraceptive pill (COCP). Little is known about their etiology, but diagnosis is made when the cyst measures more than 3 cm . They rarely grow larger than 10 cm and appear as simple unilocular cysts on ultrasound .

Management : depends on symptoms

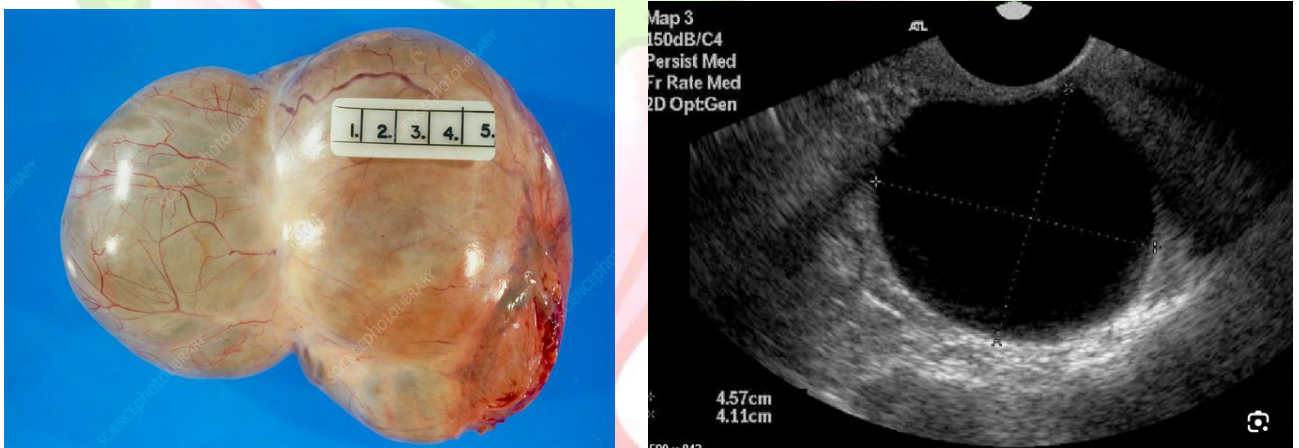
- if asymptomatic, the patient can be reassured and a repeat USS performed to check resolution or non-enlargement and thereafter the patient can be discharged;

-if symptomatic, she can be booked for laparoscopic cystectomy if necessary.

Corpus luteal cysts occur following ovulation and may present with pain due to rupture or hemorrhage, typically late in the menstrual cycle .

Treatment is expectant, with analgesia. Occasionally, surgery may be necessary if there has been significant bleeding to wash out the pelvis and perform an ovarian cystectomy.

Theca luteal cysts are associated with pregnancy, particularly multiple pregnancy, and are often diagnosed incidentally at routine ultrasound. They are often bilateral. Most resolve spontaneously during pregnancy.



Simple cyst

Inflammatory ovarian cysts

Inflammatory ovarian cysts are usually associated with pelvic inflammatory disease (PID) and are most common in young women.

The inflammatory mass may involve the tube, ovary and bowel and can be described on imaging as a mass or an abscess.

Occasionally, the tuboovarian mass can develop from other infective causes, for example appendicitis or diverticular disease.

Diagnosis is similar to that for PID: inflammatory markers are helpful .

treatment may include **antibiotics, surgical drainage** or excision. Definitive surgery is usually deferred until after the acute infection has resolved, due to the risks of perioperative systemic infection and bleeding from handling acutely inflamed and infected tissue.

Patients may present with **endometriomas**, often known as ‘**chocolate cysts**’ due to the presence of altered blood within the ovary. They have a characteristic ‘ground glass’ appearance on USS.

Germ cell tumors :

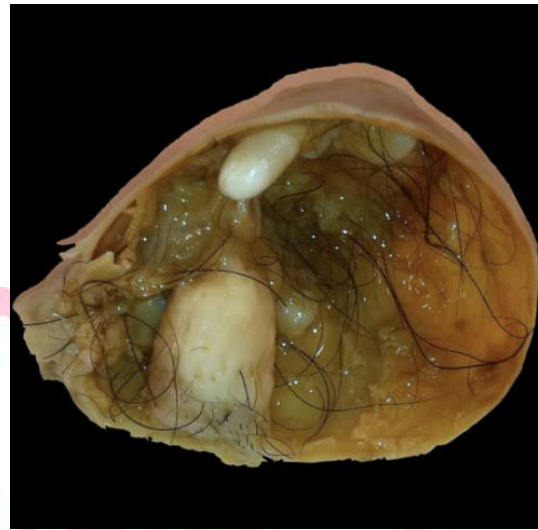
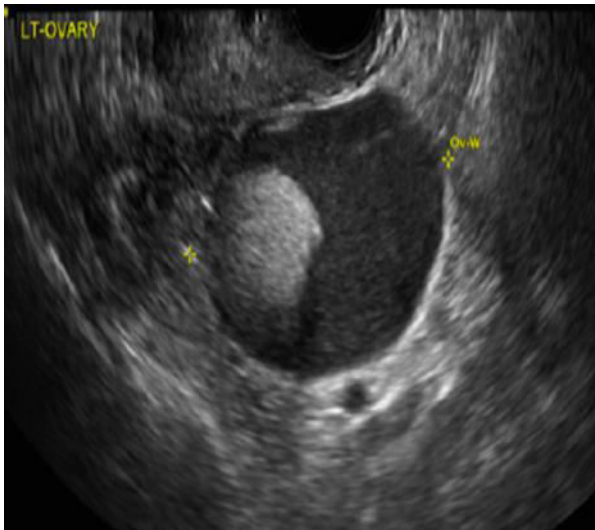
These are the most common ovarian tumours in young women aged 20–40 years, accounting for more than 50% of ovarian tumours in this age group with a peak incidence in the early 20s.

The most common form of benign germ cell tumor is the **mature dermoid cyst (cystic teratoma)**, which contains fully differentiated tissue types derived from all three embryonic germ cell layers (mesenchymal, epithelial and stroma). Hair, teeth, fat, skin, muscle, cartilage, bone and endocrine tissue are frequently present.

Treatment of germ cell tumor is usually **ovarian cystectomy** is indicated because spontaneous resolution is unlikely.

Surgery is especially indicated if the dermoid cyst is **symptomatic** ,is **more than 5 cm** in diameter or **is enlarging**.

Cystectomy will prevent ovarian torsion and provide tissue for histological analysis.



dermoid cyst

Epithelial tumours

Benign epithelial tumours increase in frequency with age and are most common in perimenopausal women.

The most common epithelial tumours are serous cystadenomas, accounting for 20–30% of benign tumours in women under 40.

Serous cystadenomas are typically unilocular and unilateral, whereas **mucinous cystadenomas** are large multiloculated cysts that are bilateral in 10% of cases.

Sex cord stromal tumours

Ovarian fibromas are the most common sex cord stromal tumours. They are solid ovarian tumours composed of stromal cells. They present in older women, often with torsion due to the heaviness of the ovary.

Occasionally, patients may present with Meig syndrome (pleural effusion, ascites and ovarian fibroma). Following

removal of the ovarian fibroma, the pleural effusion will usually resolve.

Thecomas are benign oestrogen-secreting tumours. They often present after the menopause with manifestations of excess oestrogen production, usually postmenopausal bleeding. Although benign, they may induce an endometrial carcinoma.

Other ovarian cysts :

Other non-ovarian cysts can occasionally present as ovarian tumours. **Fimbrial cysts** and **paratubal cysts** originate from the adjacent Fallopian tube and broad ligament. The uncommon embryologically derived **paraovarian cysts of Morgani** are large collections of grape-like cysts derived from the paraoophoron.

