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# *Ovarian Cyst*

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# OVARIAN CYST

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**Abstract:**

An ovarian cyst is a common gynecological problem and is divided into 2 main categories; physiological and pathological. Physiological cysts are follicular cysts and luteal cysts. Pathological cysts are considered as ovarian tumors, which might be benign, malignant, and borderline. Benign tumors are more common in young females, but malignant are more frequent in elderly females. Most ovarian cysts are asymptomatic and disappear spontaneously. When ovarian cysts are large, they may cause abdominal discomfort. If pressing on the bladder it may also cause frequency of urination. The signs and symptoms of ovarian cysts may include; pelvic pain, dysmenorrheal, and dyspareunia. Other symptoms are nausea, vomiting, or breast tenderness, fullness and heaviness in the abdomen and frequency and docility emptying of the bladder.4 Patients with clear, simple ovarian cysts diagnosed by ultrasound might not require any treatment. However, monitoring using serial ultrasonography was carried out in women with simple ovarian cysts smaller than 5 cm in diameter and a normal CA 125. There is a good evidence to suggest safety of observing even a 10 cm ovarian cyst.5,6 e aim of this study is to review cases of ovarian cysts treated at a university hospital, and to analyze the method of management and factors acting the decision regarding the method of management (laparoscopy versus laparotomy.

**Keywords:** Ovarian Cysts and Pregnancy; Ovarian Cysts; Ovarian Masses; Risk-of Malignancy Index.

## Introduction

An ovarian cyst is a sac filled with liquid or semiliquid material that arises in an ovary. The number of diagnoses of ovarian cysts has increased with the widespread implementation of regular physical examinations and ultrasonography technology. The discovery of an ovarian cyst causes considerable anxiety in women owing to fears of malignancy, but the vast majority of ovarian cysts are benign. These cysts can develop in females at any stage of life, from the neonatal period to post menopause. Most ovarian cysts, however, occur during infancy and adolescence, which are hormonally active periods of development. Most are functional in nature and resolve without treatment. However, ovarian cysts can herald an underlying malignant process or, possibly, distract the clinician from a more dangerous condition, such as ectopic pregnancy, ovarian torsion, or appendicitis. On the other hand, there may be an inverse relationship between ovarian cysts and breast cancer.

## Signs and symptoms

Most patients with ovarian cysts are asymptomatic, with the cysts being discovered incidentally during ultrasonography or routine pelvic examination. Some cysts, however, may be associated with a range of symptoms, sometimes severe, including the following [3] :

- Pain or discomfort in the lower abdomen
- Severe pain from torsion (twisting) or rupture - Cyst rupture is characterized by sudden, sharp, unilateral pelvic pain; this can be associated with trauma, exercise, or coitus.[3,4] Cyst rupture can lead to peritoneal signs, abdominal distention, and bleeding (which is usually self-limited)
- Discomfort with intercourse, particularly deep penetration
- Changes in bowel movements such as constipation
- Pelvic pressure causing tenesmus or urinary frequency
- Menstrual irregularities[5]
- Precocious puberty and early menarche in young children
- Abdominal fullness and bloating
- Indigestion, heartburn, or early satiety
- Endometriomas - These are associated with endometriosis, which causes a classic triad of painful and heavy periods and dyspareunia
- Tachycardia and hypotension - These may result from hemorrhage caused by cyst rupture
- Hyperpyrexia - This may result from some complications of ovarian cysts, such as ovarian torsion[3]

- Underlying malignancy may be associated with early satiety, weight loss/cachexia, lymphadenopathy, or shortness of breath related to ascites or pleural effusion

**Diagnosis**

Per ACOG guidelines, transvaginal ultrasound is the preferred imaging modality for assessment of a suspected pelvic mass.[6]

The definitive diagnosis of all ovarian cysts is made based on histologic analysis. Each cyst type has characteristic findings.

Laboratory tests, although not diagnostic for ovarian cysts, may aid in the differential diagnosis of cysts and in the diagnosis of cyst-related complications. Studies include the following:

1. Urinary pregnancy test
2. Complete blood count (CBC)
3. Urinalysis
4. End cervical swabs if infectious etiology is suspected
5. Serum biomarker testing

**Pathophysiology**

- **Follicular cysts**

Different kinds of functional ovarian cysts can form during this cycle. In the follicular phase, follicular cysts may result from a lack of physiologic release of the ovum due to excessive FSH stimulation or lack of the normal LH surge at midcycle just before ovulation. Hormonal stimulation causes these cysts to continue to grow. Follicular cysts are typically larger than 2.5 cm in diameter and manifest as a discomfort and heaviness. Granulose cells that line the follicle may

also persist, leading to excess estradiol production, which, in turn, leads to decreased frequency of menstruation and menorrhagia [7].

- Neoplastic cysts

Neoplastic cysts arise via the inappropriate overgrowth of cells within the ovary and may be malignant or benign. Malignant neoplasms may arise from all ovarian cell types and tissues. The most frequent by far, however, are those arising from the surface epithelium (mesothelium); most of these are partially cystic lesions. The benign counterparts of these cancers are serous and mucinous cyst adenomas. Other malignant ovarian tumors may also contain cystic areas, including granulosa cell tumors from sex cord stromal cells and germ cell tumors from primordial germ cells.

- Teratomas

Teratomas are a form of germ cell tumor [8] containing elements from all 3 embryonic germ layers, ie, ectoderm, endoderm, and mesoderm. A mature cystic teratoma is shown in the image below.

- Endometriomas

Endometriomas are blood-filled cysts arising from the ectopic endometrium. Endometriomas are associated with endometriosis, which can cause dysmenorrhea and dyspareunia.

- Polycystic ovarian syndrome

In polycystic ovarian syndrome, the ovary often contains multiple cystic follicles 2-5 mm in diameter as viewed on sonograms.

**Risk factors**

Risk factors for ovarian cyst formation include the following:

- Infertility treatment - Patients being treated for infertility by ovulation induction with gonadotropins or other agents, such as clomiphene citrate or letrozole, may develop cysts as part of ovarian hyper stimulation syndrome
- Tamoxifen - Tamoxifen can cause benign functional ovarian cysts that usually resolve following discontinuation of treatment
- Pregnancy - In pregnant women, ovarian cysts may form in the second trimester, when hCG levels peak [9]
- Hypothyroidism - Because of similarities between the alpha subunit of thyroid-stimulating hormone (TSH) and hCG, hypothyroidism may stimulate ovarian and cyst growth[10]
- Maternal gonadotropins - The transplacental effects of maternal gonadotropins may lead to the development of neonatal and fetal ovarian cysts[11]
- Cigarette smoking - The risk of functional ovarian cysts is increased with cigarette smoking; risk from smoking is possibly increased further with a decreased body mass index (BMI)[12, 13]
- Tubal ligation - Functional cysts have been associated with tubal ligation sterilizations[14]

Risk factors for ovarian cyst adenocarcinoma include the following:

- Strong family history
- Advancing age
- White race
- Infertility
- Nulliparity

- History of breast cancer
- BRCA gene mutations

**Management**

Many patients with simple ovarian cysts found through ultrasonographic examination do not require treatment. In a postmenopausal patient, a persistent simple cyst smaller than 10 cm in dimension in the presence of a normal CA125 value may be monitored with serial ultrasonographic examinations.[5,15,6]

- **Pharmacologic therapy**

Oral contraceptive pills (OCPs) protect against the development of functional ovarian cysts. Existing functional cysts, however, do not regress more quickly when treated with combined oral contraceptives than they do with expectant management.[16]

- **Laparotomy and laparoscopy**

Persistent simple ovarian cysts larger than 10 cm (especially if symptomatic) and complex ovarian cysts should be considered for surgical removal. The surgical approaches include an open technique (laparotomy) or a minimally invasive technique (laparoscopy) with very small incisions. The latter approach is preferred in cases presumed benign.[6] Removing the cyst intact for pathologic analysis may mean removing the entire ovary, though a fertility sparing surgery should be attempted in younger women.[6]

- **Bilateral oophorectomy**

Bilateral oophorectomy and, often, hysterectomy are performed in many postmenopausal women with ovarian cysts, because of the increased incidence of neoplasms in this population.

**Complications**

Ovarian cysts have a broad range of potential outcomes. In most cases, the cyst is benign and asymptomatic, requires no further management, and will resolve on its

own. In other cases, ovarian cyst–related accidents, such as rupture and hemorrhage or torsion, occur.

**Prognosis**

The prognosis for benign cysts is excellent. All such cysts may occur in residual ovarian tissue or in the contralateral ovary. Overall, 70%-80% of follicular cysts resolve spontaneously.

Malignancy is a common concern among patients with ovarian cysts. Pregnant patients with simple cysts smaller than 6cm in diameter have a malignancy risk of less than 1%. Most of these cysts resolve by 16-20 weeks' gestation, with 96% of these masses resolving spontaneously [17]. In postmenopausal patients with unilocular cysts, malignancy develops in 0.3% of cases.

In complex, multiloculated cysts, the risk of malignancy climbs to 36%. If cancer is diagnosed, regional or distant spread may be present in up to 70% of cases, and only 25% of new cases will be limited to stage I disease [18].

Mortality associated with malignant ovarian carcinoma is related to the stage at the time of diagnosis, and patients with this carcinoma tend to present late in the course of the disease. The 5-year survival rate overall is 41.6%, varying between 86.9% for International Federation of Gynecology and Obstetrics (FIGO) stage Ia and 11.1% for stage IV.

A distinct group of less aggressive tumors of low malignant potential runs a more benign course but still is associated with definite mortality. The overall survival rate is 86.2% at 5 years [19].

The potential of benign ovarian cyst adenomas to become malignant has been postulated but, to date remains unproven. Malignant change can occur in a small percentage of dermoid cysts (associated with an extremely poor prognosis) and endometriomas.

## Patient education

Provide patients with adequate discharge and follow-up instructions and information, including documentation of the potential risks of infertility, disability, and malignancy caused by delays or noncompliance.

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