

Causes and Management of Ovarian Cysts

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ABSTRACT

An ovarian cyst is a sac filled with liquid or semiliquid material that arises in an ovary. While the discovery of an ovarian cyst causes considerable anxiety in women owing to fears of malignancy, the vast majority of these lesions are benign. 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. Many patients with simple ovarian cysts found through ultrasonographic examination do not necessitate 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. When ovarian cysts are large, persistent, painful or have concerning radiographic or exam findings, surgery may be required, sometimes resulting in removal of the ovary. We conducted this review using a comprehensive search of MEDLINE, PubMed, EMBASE, Cochrane database of systematic reviews and Cochrane central register of controlled trials from January 1, 1995, through January 1, 2017.

Keywords: ovarian cysts, fetal and neonatal cysts, laparotomy and laparoscopy.

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 improved with the widespread carrying out of regular physical examinations and ultrasonographic technology. The detection of an ovarian cyst causes substantial anxiety in women owing to fears of malignancy, but the vast majority of ovarian cysts are benign. These cysts can progress in females at any stage of life, from the neonatal period to post menopause. Most ovarian cysts, nonetheless, arise 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, probably, distract the clinician from a more unsafe condition, for example, appendicitis, ovarian torsion, or ectopic pregnancy. (Conversely, there could be an inverse association between breast cancer and ovarian cysts). Once ovarian cysts are large, painful, persistent or have concerning radiographic or exam findings, surgery may be required, from time to time resulting in removal of the ovary^[1, 2].

Abdominal pain in the female can be one of the most difficult cases to diagnose correctly in the emergency department (ED). The spectrum of gynecologic disease is broad, spanning all age ranges and representing numerous degrees of severity, from benign cysts that eventually resolve on their own to ruptured ectopic pregnancy that causes life-threatening hemorrhage. When obtainable with this scenario, the goal of the emergency physician is to rule out acute causes of abdominal pain related with high morbidity and

mortality, for example, ovarian torsion, appendicitis, or ectopic pregnancy, to evaluate for the likelihood of neoplasm or malignancy and either to refer the patient to the suitable consultant or to discharge them with a clear plan for follow-up with an obstetrician/gynecologist.

MATERIALS AND METHODS

• Data Sources and Search terms

We conducted this review using a comprehensive search of MEDLINE, PubMed, EMBASE, Cochrane Database of Systematic Reviews and Cochrane Central Register of Controlled Trials from January 1, 1995, through January 1, 2017.

• Data Extraction

Two reviewers independently reviewed studies, abstracted data and resolved disagreements by consensus. Studies were evaluated for quality. A review protocol was followed throughout.

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^[3], while malignant ovarian cysts frequently do not cause symptoms until they reach an advanced stage.

Pain or anxiety may arise in the lower abdomen. Torsion (twisting) or rupture may lead to more severe pain. Cyst rupture is characterized by sudden, unilateral, sharp pelvic pain. This can be allied with trauma, exercise, or coitus. Furthermore, cyst rupture can lead to peritoneal signs, abdominal distention and bleeding that is commonly self-limited^[3, 4].

Other symptoms include the following

- Patients may experience discomfort with intercourse, particularly deep penetration
- Having bowel movements may be difficult, or pressure may develop, leading to a desire to defecate
- Some patients may experience tenesmus
- Patients may experience abdominal fullness and bloating
- Young children may present with precocious puberty and early onset of menarche
- Patients may experience indigestion, heartburn, or early satiety
- Micturition may occur frequently, due to pressure on the bladder
- Polycystic ovaries may be part of the polycystic ovarian syndrome, which includes hirsutism, infertility, oligomenorrhea, obesity, and acne
- Irregularity of the menstrual cycle and abnormal vaginal bleeding may occur; the intermenstrual interval may be prolonged, followed by menorrhagia^[1]
- Endometriomas are associated with endometriosis, which may cause dysmenorrhea or dyspareunia
Theca-lutein cysts are normally bilateral and therefore can cause bilateral and dull pelvic pain^[5]. These cysts can be allied with excess stimulation, as is seen in pregnancy (in particular twins), a large placenta, and diabetes. Newborns might likewise develop theca-lutein cysts, as a result of the effects of maternal gonadotropins. In occasional cases, these cysts can progress in the setting of hypothyroidism, as a result of relationships between the alpha subunit of TSH and hCG^[5, 6].

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. In postmenopausal patients with unilocular cysts, malignancy develops in 0.3% of cases^[7].

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^[8]. Mortality related with malignant ovarian carcinoma is linked to the stage at the time of diagnosis, and patients with this

carcinoma be inclined 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 is still associated with definite mortality. The total survival rate was 86.2% at 5 years^[9].

The potential of benign ovarian cystadenomas to become malignant has been assumed but, up to the present time, residues unproven. Malignant change can arise in a small percentage of dermoid cysts (related with an extremely poor prognosis) and endometriomas.

Management of Ovarian Cysts

Epidemiologic studies from the 1970s-1990s reported inverse associations between oral contraceptive pill (OCP) use and surgically confirmed functional ovarian cysts. Short-term treatment with OCPs was accordingly used for initial management of ovarian cysts. Nonetheless, meta-analyses had shown that there is no difference between OCP utilization and placebo in terms of management outcomes in ovarian cysts and that these masses ought to be monitored expectantly for numerous menstrual cycles. If a cystic mass does not resolve after this timeframe, it is unlikely to be a functional cyst, and further workup may be specified^[10].

Many patients with simple ovarian cysts based on ultrasonographic findings do not require treatment. In a postmenopausal patient, a persistent simple cyst smaller than 10cm in dimension in the presence of a normal CA125 value may be monitored with serial ultrasonographic examinations^[4]. Premenopausal women with asymptomatic simple cysts smaller than 8cm on sonograms in whom the CA125 value was within the reference range can be monitored, with a repeat ultrasonographic examination in 8-12 weeks. Hormone treatment, comprising, as stated above, the use of the OCPs, is not helpful in resolving the cyst^[10].

Postmenopausal Ovarian Cysts

Most studies evaluated the pervasiveness of simple, unilocular adnexal cysts in asymptomatic, postmenopausal women at 3-18%, with most of these cysts being smaller than 5cm in diameter. Initial studies specified the risk of malignancy for these asymptomatic adnexal cysts in postmenopausal patients to be as high as 7%, but following studies presented the pervasiveness to be less than 1% in small cysts^[11]. In these patients,

repeat ultrasonography at 4-6 weeks can be achieved accompanied by CA125 studies in an outpatient setting. Half of asymptomatic cysts smaller than 5 cm resolve in 2 months, but rising CA125 levels or increasing cyst size or complexity may warrant surgery. Follow-up care is important, as the risk of an ovarian neoplasm being malignant rises from 13% in premenopausal patients to 45% in postmenopausal patients^[8].

Bilateral oophorectomy

Bilateral oophorectomy and frequently, hysterectomy are implemented in many postmenopausal women with ovarian cysts due to the increased occurrence of neoplasms in this population.

- **Transfer**

When a female patient presents in the emergency department (ED) with abdominal pain and signs or symptoms of an intraperitoneal process of unclear etiology, transfer is specified if any of the following conditions are met:

- Imaging capacity is not available at the facility
- Operative capacity is not available at the health-care delivery site
- Backup surgical, obstetric, or gynecologic support is not available to the ED

Unstable patients should not be transferred unless the facility is truly unable to provide appropriate treatment or evaluation. The patient is the responsibility of the transferring physician until her arrival at the next hospital.

- **Laparotomy and Laparoscopy**

Persistent simple ovarian cysts larger than 5-10 cm, especially if symptomatic, and complex ovarian cysts should be considered for surgical removal. The surgical approaches include an open incisional technique (laparotomy) and a minimally invasive technique (laparoscopy) with very small incisions. Whichever method is used, the objectives stay the same; they contain the following:

- To confirm the diagnosis of an ovarian cyst
- To perform additional surgery as specified
- To assess the opposite ovary and other abdominal organs
- To assess whether the cyst appears to be malignant
- To obtain fluid from peritoneal washings for cytologic evaluation
- To remove the entire cyst intact for pathologic analysis - This may mean removing the entire ovary

The utilization of laparoscopic techniques is becoming prevalent, and the indications are extending. Laparoscopy is ideal to laparotomy when indicated as it has less adverse effects for the

patient and leads to faster recovery^[12]. Nonetheless, it is important that the disease outcome for the patient not be inferior to that accomplished with laparotomy^[13]. Several patients, including those with chronic lung disease who are incapable to endure a high intra-abdominal pressure or a steep head-down position, are inappropriate for laparoscopy. Others are inappropriate due to earlier surgeries causing severe adhesions. For numerous situations the most significant factor is the skill and experience of the surgeon.

With benign cysts there is no absolute contraindication to the use of laparoscopy. Such patients contain those considered to have a dermoid cyst or endometrioma, those with functional or simple cysts that are causing symptoms and have not resolved with conservative management, and those presenting with acute symptoms. The aim should be to remove all cysts intact^[14,15], however if this is not possible, the cyst and/or affected ovary can be placed in a protective bag that permits the cyst to be ruptured and drained without infection prior to removal. Malignant ovarian cysts connected with prevalent disease are regularly treated by laparotomy. Several debates surround the surgical technique for very large, benign-appearing ovarian cysts. The traditional technique for both was a long, midline incision in order to permit removal of the intact cyst and ovary. Some now promote a laparoscopic technique with drainage of the cyst, permitting the ovary to be removed through a small incision^[16]. The down side to this is the potential for the cyst to spill cancer cells into the abdominal cavity. Laparoscopy is currently used to remove small to medium-sized cancerous ovarian cysts (up to about 12 cm) and to stage ovarian cancer.

Excision of a benign cyst alone such as a dermoid or functional cyst or an endometrioma with conservation of the ovary can be completed in patients who desire retention of their ovaries for future fertility or for other reasons. If the ovarian cyst is benign, removal of the opposite ovary ought to be considered in perimenopausal, postmenopausal, and premenopausal women older than 35 years who have completed their family and are considered at increased genetic danger for consequent development of ovarian carcinoma. These indications are all relative, and the issues ought to be discussed with the patient prior to any surgery. A gynecologic cancer specialist ought to be obtainable to help with any patient who experiences surgery for a potentially malignant ovarian cyst. Whenever possible, the patient ought to consult with the specialist prior to the surgery to permit all issues to be addressed. This will allow

the suitable surgery to be performed on patients found to have cancer.

- **Ovarian Cysts in Pregnancy**

The corpus luteum is responsible for progesterone production throughout pregnancy and usually relapses at around 8 weeks' gestation^[9]. Most pregnancy-associated cysts, for example, corpus luteal and follicular cysts, resolve by gestational age 14-16 weeks and are hormonally responsive, permitting conservative management^[9]. By gestational age 16-20 weeks, up to 96% of masses resolve instinctively. Resolution of cysts is less probable when larger than 5cm or of complex morphology^[4]. Simple cysts smaller than 6 cm in diameter have a risk of malignancy of less than 1% . Corpus luteal cysts are inclined to be larger and more symptomatic than follicular cysts and are more prone to hemorrhage and rupture. Follicular cysts are typically smaller, with internal hemorrhage being relatively infrequent^[7].

Masses that persevere longer might warrant more workup for potential neoplastic disease based on clinical findings and radiologic evidence. Serum CA125 studies are not suggested in pregnancy, as levels can fluctuate generally in normal pregnancy, mainly in the first and second trimesters and can be raised in many benign conditions. One group recommends observation, with postpartum surgery in select patients who have large, persistent adnexal masses in whom ultrasonographic results are not highly suggestive of malignancy^[17]. Nonetheless, in situations in which cysts are symptomatic, containing initiating pain and discomfort, or with rapid growth on serial ultrasound, surgical removal ought to be considered. If malignancy is an opportunity and peripartum surgery is necessary, the danger of damaging the pregnancy is weighed against a delay in management, but surgery is commonly delayed until the mid-second trimester, when most cysts have resolved^[9]. Some ovarian conditions unique to pregnancy comprise the hyperstimulated ovary, hyperreactio luteinalis, ovarian hyperstimulation syndrome, theca-lutein cysts, and luteoma of pregnancy. Hyperstimulated ovaries characterize a normal ovarian response to circulating hCG levels and are normally seen in women who have experienced ovulation induction.

Fetal and Neonatal Cysts

In female newborns, ovarian cysts are the most frequent type of abdominal tumor, with an estimated frequency of more than 30%^[18, 19]. Fetal ovarian cysts are believed to be caused by hormonal stimulation, such as fetal gonadotropins, maternal estrogen, and placental hCG. In addition, suggestion of fetal ovarian cysts and maternal

diabetes and fetal hypothyroidism has been recognized. Most fetal ovarian cysts are small and involute within the first few months of life and are not of clinical significance. They are generally diagnosed in the third trimester of pregnancy, and most tend to resolve at 2-10 weeks postnatally^[19].

Differential diagnoses of these cysts contain urachal cysts, intestinal duplication irregularities, cystic teratoma and intestinal obstruction. Intrauterine ultrasonography is necessary to distinguish ovarian cysts from these other likelihoods^[18]. Aspiration of these cysts can be performed but is associated with complications, such as reformation of cyst, infection, and premature labor. Once the diagnosis of a fetal ovarian cyst is made, it is important to perform serial ultrasonographic examinations to detect any structural changes in size or appearance or complications, such as hydramnios, ascites, or torsion. Of these complications, ovarian torsion is the most serious complication of a fetal ovarian cyst and may manifest as fetal tachycardia due to peritoneal irritation. Appropriate management contains serial ultrasonography to look for signs of regression or postnatal surgery if the cyst is complicated or larger than 5 cm in diameter^[19].

CONCLUSION

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. 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. Removing the cyst intact for pathologic analysis may mean removing the entire ovary, though a fertility sparing surgery should be attempted in younger women.

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