



OVARIAN CYST: A LITERATURE REVIEW

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ABSTRACT:

Ovarian cysts occur frequently in women of reproductive age. These are usually functional cysts which resolve spontaneously and whose evolution can be followed with ultrasound. Non-functional cysts have diverse histologic origins. The most common are serous and mucinous cystadenomas which arise from the epithelial wall of the ovary, endometriomas which arise in the setting of pelvic endometriosis, and dermoid cysts which arise from the germinal cells of the ovary. Endovaginal ultrasound with Doppler enhancement is the best imaging technique to establish the nature of cysts and to distinguish cysts suspicious for malignancy which require more invasive investigation. Pelvic laparoscopy is the surgical approach of choice for the treatment of non-functional benign ovarian cysts. Conservative treatment to shell out the cyst and preserve functional ovarian tissue should be reserved for women desirous of future pregnancies. The risk of ovarian cancer remains a major preoccupation of the surgeon. Where malignancy is suspected, laparoscopy is contraindicated and a median laparotomy is appropriate for radical extirpative surgery. This article describes the diagnostic techniques which allow a laparoscopic approach to presumably benign cysts and discusses surgical techniques specifically adapted to their different histologic nature of ovarian cysts.

KEYWORDS:

Etiology,
Risk factors,
Epidemiology,
Treatment.

INTRODUCTION:

The adnexa is a set of structures adjacent to the uterus, consisting of the ovaries and fallopian tubes. Even though the fallopian tubes are one of the major adnexal structures, this article will focus on the ovaries and the different types of cysts that can form within the ovary. The ovaries are suspended laterally to the uterus via the utero-ovarian ligament, covered by the mesovarium, which is one of the three components of the broad ligament, and connected to the pelvic sidewall via the infundibulopelvic ligament, which is also known as the suspensory ligament of the ovary. The blood supply to the ovaries comes directly from the ovarian artery, a direct branch of the aorta. The venous drainage is unique as the right ovarian vein drains directly into the

inferior vena cava, whereas the left renal vein drains the left ovarian vein. In premenopausal women, the ovaries produce numerous follicles a month, with one dominant follicle maturing and undergoing ovulation.

As a result of ovulation, a fluid-filled sac known as an ovarian cyst can form on one or both ovaries. Adnexal masses or ovarian cysts are not uncommon, with 20% of women developing at least one pelvic mass in their lifetime. Various subcategories have characterized more than thirty types of ovarian masses, and management is determined by the characteristics of the lesion, the age of the patient, and the risk factors for malignancy. In women of reproductive age, most ovarian cysts are functional and benign and do not require surgical intervention. However, ovarian cysts can lead to complications such as pelvic pain, cyst rupture, blood loss, and ovarian torsion that require prompt management.

ETIOLOGY:

The etiology of ovarian cysts or adnexal masses ranges from physiologically normal (follicular or luteal cysts) to ovarian malignancy. Ovarian cysts can occur at any age but are more common in reproductive years and increase in menarchal females due to endogenous hormone production. Simple cysts are the most likely to occur in all age groups, and mixed cystic and solid and completely solid ovarian lesions have a higher rate of malignancy than simple cysts. Although most ovarian cysts are benign, age is the most important independent risk factor, and post-menopausal women with any type of cyst should have proper follow-up and treatment due to a higher risk for malignancy.

RISK FACTORS FOR OVARIAN CYST FORMATION INCLUDE:

- Infertility treatment- Patients treated with gonadotropins or other ovulation induction agents may develop cysts as part of ovarian hyperstimulation syndrome.
- Tamoxifen.
- Pregnancy- In pregnancy, ovarian cysts may form in the second trimester when hCG levels peak.
- Hypothyroidism
- Maternal gonadotropins- The transplacental effects of maternal gonadotropins may lead to the development of fetal ovarian cysts.
- Cigarette smoking
- Tubal ligation- Functional cysts have been associated with tubal ligation sterilizations.

EPIDEMIOLOGY:

The actual prevalence of ovarian cysts is unknown, as many patients are believed to be asymptomatic and undiagnosed, and the prevalence depends on the population studied. Approximately 4% of women will be admitted to the hospital for ovarian cysts by age 65. In a random sample of 335 asymptomatic 24 to 40-year-old women, the prevalence of an adnexal lesion was 7.8%.^[11] Another study that examined ovarian cysts in postmenopausal women showed a prevalence of 2.5% for a simple unilocular adnexal cyst.^[12] In a survey of 33,739 premenopausal and postmenopausal women, 46.7% had an adnexal cyst on transvaginal ultrasound, with 63.2% showing resolution of the abnormality on subsequent ultrasounds.^{[13][14]}

In postmenopausal women, 18% can develop one or more Graffian follicles, which appear as cysts on imaging.^{[11][15][16]} Most of these cysts are benign. Mature cystic teratomas or dermoids represent more than 10% of all ovarian neoplasms. Ovarian cysts are the most common tumor in infants and fetuses, with more than 30% prevalence.^[17] In the United States, ovarian carcinomas are diagnosed in more than 21000 women annually, causing 14,600 deaths.

PATHOPHYSIOLOGY:

During the normal menstrual cycle, the follicular phase is characterized by increasing follicle-stimulating hormone (FSH) production. That leads to the selection of dominant follicles for priming to release from the ovary. In a normal functioning ovary, estrogen production from the dominant follicle leads to a luteinizing

hormone surge (LH), resulting in ovulation. After ovulation, follicular remnants form a corpus luteum, which produces progesterone. This inhibits FSH and LH production. If pregnancy does not occur, the progesterone declines, FSH and LH rise, and the next cycle begins.

Functional Cysts

Follicular and Corpus Luteal Cysts

Follicular and corpus luteal cysts are considered functional or physiologic cysts, and both occur during the normal menstrual cycle. Follicular cysts arise when follicles fail to rupture during ovulation and can appear smooth, thin-walled, and unilocular. In the follicular phase, follicular cysts may form because of a lack of physiological release of the ovum due to excessive FSH stimulation or the absence of the usual LH surge at mid-cycle just before ovulation. These cysts continue to grow because of hormonal stimulation. Follicular cysts are usually larger than 2.5 cm in diameter. Granulosa cells lead to excess estradiol production, which in turn leads to decreased frequency of menstruation.

Without pregnancy, the life span of the corpus luteum is 14 days. If the egg is fertilized, the corpus luteum continues to secrete progesterone until its dissolution at 14 weeks, when the cysts undergo central hemorrhage. If the dissolution of the corpus luteum does not occur, it may result in a corpus luteal cyst, which usually grows to 3cm. Corpus luteal cysts can appear complex or simple, thick-walled, or contain internal debris. Corpus luteum cysts are always present during pregnancy and usually resolve by the end of the first trimester. Both follicular and corpus luteal cysts can turn into hemorrhagic cysts. They are generally asymptomatic and spontaneously resolve without treatment.

TREATMENT:

There are several different treatment options available, but ultimately management depends on the patient's age, menopausal status, the size of the cyst, and whether the cyst has characteristics suspicious of malignancy. Unilocular cysts less than 10 cm are usually benign regardless of patient age; therefore, if the patient is asymptomatic, she can be monitored conservatively with serial transvaginal ultrasound since the majority of cysts resolve spontaneously without intervention. If a cyst does not resolve after several menstrual cycles, it is unlikely to be a functional cyst, and further workup is indicated.

Fetal ovarian cysts are caused by hormonal stimulation. Also, an association between fetal ovarian cysts and maternal diabetes and fetal hypothyroidism has been found. Most fetal ovarian cysts are usually small and involute during the first few months of life and are of no significance. These cysts are diagnosed in the third trimester of pregnancy, and most tend to resolve at 2 to 10 weeks postnatally.

Most pregnancy-associated cysts, both corpus luteal and follicular, resolve spontaneously by 14 to 16 weeks of gestation, allowing conservative management. The resolution of cysts is less likely when larger than 5cm or with complex morphology. Simple cysts smaller than 6 cm have only less than 1% risk of malignancy.

In women of all ages, endometriomas should have followed up sonograms 6 to 12 weeks after initial imaging, then yearly until surgically removed. Dermoid cysts should also have a yearly follow-up with ultrasound until surgical removal.

Surgical indications include suspected ovarian torsion, persistent adnexal mass, acute abdominal pain, and suspected malignancy. Surgery in pre-menopausal women prioritizes fertility preservation, and every attempt is made to remove minimal ovarian tissue. Pregnant patients can have cysts that may require surgical management. Although laparoscopy is safe in all trimesters of pregnancy, ideally, it is recommended to perform surgery in the second trimester.

COMPLICATIONS:

There are three classic complications of ovarian cysts that commonly present to the emergency department:

- Rupture

- Hemorrhage
- Torsion

The fifth most common gynecological emergency is ovarian torsion, defined as the complete or partial twisting of the ovarian vessels resulting in obstruction of blood flow to the ovary. The diagnosis is made clinically with the assistance of a history and physical examination, bloodwork, and imaging and is confirmed by diagnostic laparoscopy. The latest evidence supports a conservative approach during diagnostic laparoscopy, and detorsion of the ovary with or without cystectomy is recommended to preserve fertility. Ovarian cysts can also rupture or hemorrhage, with most of these being physiological. Most cases are uncomplicated with mild to moderate symptoms, and those with stable vital signs can be managed expectantly.

CONCLUSION:

Ovarian cysts are a common occurrence in women of all ages. Pharmacists may be asked about the condition by their patients, especially if the patient is using hormonal contraceptives or is undergoing ovulation induction. Functional ovarian cysts are physiologic and usually resolve spontaneously within a couple of menstrual cycles. Combined oral contraceptives may be used to prevent the occurrence of these cysts; however, they do not accelerate cyst resolution. Ovarian neoplasms often are benign in women of reproductive age. The risk of an ovarian mass being malignant increases with age. Measurement of CA-125 may be helpful in distinguishing between benign and malignant ovarian masses, especially in postmenopausal women. While laparoscopy is commonly used to remove benign cysts, laparotomy is often preferred for removal of masses that may be malignant.

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