CLINICAL FEATURES AND MORPHOLOGICAL CHANGES OF OVARIAN CYSTS

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Annotation: This article examines the clinical features, morphological characteristics, and pathological changes of ovarian cysts. The main types of ovarian cysts, their developmental mechanisms, clinical manifestations, and diagnostic significance are analyzed. Furthermore, the importance of morphological examination in early disease detection, prevention of complications, and selection of appropriate treatment strategies is discussed, with particular emphasis on preserving reproductive health and improving patient outcomes.

Keywords: ovarian cysts, clinical features, morphological changes, diagnosis, pathology, reproductive health.

Classification, etiology, and pathogenesis of ovarian cysts: Ovarian cysts are fluid-filled or semi-solid formations that develop within or on the surface of the ovaries. They represent a common gynecological condition among women of reproductive age and may occur in different age groups, depending on their etiology and histological characteristics. Ovarian cysts vary considerably in size, internal structure, hormonal activity, and clinical significance. Although many cysts are benign and resolve spontaneously, some may persist, enlarge, cause complications, or require surgical intervention. Understanding their classification, etiology, and pathogenesis is essential for accurate diagnosis and appropriate clinical management.

Ovarian cysts are generally classified into functional cysts and pathological cysts. Functional cysts are associated with the normal ovarian cycle and usually develop as a result of disturbances in follicular development or corpus luteum

function. The most common examples include follicular cysts and corpus luteum cysts. Follicular cysts develop when a dominant follicle fails to rupture during ovulation or when the follicle does not regress normally. As fluid accumulates within the follicular cavity, the structure gradually enlarges and becomes a cyst. These cysts are usually thin-walled and contain clear, watery fluid. Their development is closely related to the physiological regulation of the hypothalamic-pituitary-ovarian axis. Corpus luteum cysts arise when the corpus luteum persists after ovulation and accumulates fluid or blood. The corpus luteum normally produces progesterone, which supports the endometrium during the luteal phase of the menstrual cycle. When regression is delayed or bleeding occurs within the corpus luteum, a cystic formation may develop. These cysts can contain hemorrhagic material and may occasionally cause acute pelvic pain if bleeding or rupture occurs. Most functional cysts regress spontaneously within several menstrual cycles without requiring specific treatment.

Pathological ovarian cysts include endometriomas, dermoid cysts, and cystic epithelial neoplasms. Endometriomas develop in association with endometriosis, a condition characterized by the presence of endometrial-like tissue outside the uterine cavity. When this tissue affects the ovary, repeated bleeding and the accumulation of degraded blood products produce a cyst containing thick, dark-brown fluid. Dermoid cysts, also known as mature cystic teratomas, originate from germ cells and may contain tissues such as hair, sebaceous material, skin, and occasionally bone or cartilage. Their complex composition reflects the differentiation potential of the originating germ cells. Epithelial ovarian cystic lesions include serous and mucinous cystadenomas, which are generally benign, as well as borderline and malignant neoplasms. Serous lesions typically contain thin, watery fluid, whereas mucinous lesions contain thicker, mucus-like material. Their biological behavior depends on the epithelial architecture, cellular atypia, and presence or absence of stromal invasion. Therefore, the identification of a cystic ovarian lesion does not

automatically indicate malignancy; clinical assessment and appropriate imaging are necessary to determine its nature.

The etiology of ovarian cysts is multifactorial and may involve hormonal disturbances, ovulatory dysfunction, endometriosis, genetic factors, and age-related biological changes. The pathogenesis differs according to the specific cyst type. Consequently, classification based on clinical presentation, imaging characteristics, and, when indicated, histopathological examination provides an essential foundation for understanding ovarian cysts and selecting an appropriate diagnostic and therapeutic approach.

Clinical features and manifestations of ovarian cysts: The clinical presentation of ovarian cysts varies according to their size, type, location, growth rate, and the presence of complications. Many ovarian cysts are asymptomatic and are discovered incidentally during routine gynecological examinations or pelvic ultrasonography. In other cases, patients may experience pelvic discomfort, abdominal pain, menstrual irregularities, or symptoms associated with pressure on adjacent organs. A comprehensive evaluation of clinical manifestations is important because symptoms alone cannot reliably distinguish benign cysts from lesions that require further investigation.

One of the most frequent symptoms associated with ovarian cysts is lower abdominal or pelvic pain. The pain may be mild, intermittent, or persistent, depending on the characteristics of the lesion. Functional cysts often produce no symptoms or cause temporary discomfort during the menstrual cycle. Larger cysts may cause a sensation of heaviness, abdominal fullness, or pressure in the pelvic region. Pain can be unilateral when the cyst affects one ovary, although the precise location of discomfort does not always correspond directly to the affected organ. Menstrual disturbances may also occur in women with ovarian cysts. Changes in ovarian hormone production can influence the menstrual cycle, resulting in delayed menstruation, irregular bleeding, or variations in cycle duration. Functional cysts

may be associated with temporary alterations in estrogen or progesterone activity. However, menstrual irregularities are nonspecific findings and may result from other gynecological, endocrine, or systemic conditions. Therefore, they should be interpreted alongside the patient's medical history, physical examination, and diagnostic findings.

Additional symptoms, such as persistent abdominal enlargement, early satiety, unexplained weight changes, or increasing abdominal pressure, warrant careful evaluation, particularly when they occur in older women or persist over time. Although these manifestations are not specific to ovarian malignancy, they should not be overlooked. Clinical assessment begins with a detailed history, including the patient's age, menstrual pattern, reproductive history, pain characteristics, and relevant family history. A physical examination may identify pelvic tenderness or a palpable mass, although small cysts are often not detectable by palpation. Transvaginal ultrasonography is a key diagnostic method for evaluating cyst size, wall thickness, internal contents, septations, and solid components. Additional laboratory investigations may be indicated according to the clinical context. Ultimately, the combination of symptoms, examination findings, and imaging characteristics helps determine whether observation, further investigation, or treatment is appropriate.

Morphological characteristics and histopathological features of ovarian cysts: The morphological examination of ovarian cysts provides essential information about their origin, structural organization, and biological behavior. Morphological characteristics can be assessed through imaging techniques, macroscopic examination, and histopathological analysis. These approaches complement one another and help distinguish functional cysts from endometriotic lesions, benign neoplasms, borderline tumors, and malignant ovarian tumors. The evaluation of cyst morphology is particularly important because lesions with similar clinical presentations may have substantially different tissue structures and clinical implications.

At the macroscopic level, ovarian cysts vary in size, shape, wall thickness, surface appearance, and internal contents. Functional follicular cysts generally have thin, smooth walls and contain clear or straw-colored fluid. Their inner surfaces are usually relatively uniform, reflecting their origin from ovarian follicles. Corpus luteum cysts may have thicker walls and a more vascular appearance. When hemorrhage occurs within the cystic cavity, the contents may consist of blood clots and altered blood products. These morphological features correspond to the physiological and pathological processes responsible for cyst formation.

Mature cystic teratomas demonstrate a different morphological pattern because they originate from germ cells capable of differentiating into various tissue types. Gross examination may reveal sebaceous material, hair, and solid components. Histopathological examination commonly identifies mature tissues derived from one or more germ layers, including keratinizing squamous epithelium, skin appendages, adipose tissue, cartilage, and neural tissue. Although mature cystic teratomas are generally benign, their complex internal composition and potential for complications make accurate identification important. Serous and mucinous cystadenomas are epithelial ovarian neoplasms characterized by cystic spaces lined by epithelial cells. Serous cystadenomas usually contain clear fluid and are lined by epithelium resembling the cells of the fallopian tube. Mucinous cystadenomas typically contain thick mucus-like material and may consist of multiple compartments separated by thin septa. The epithelial lining, number of cystic chambers, and presence of papillary projections are relevant morphological findings. However, these features must be interpreted carefully because some benign lesions, borderline tumors, and malignant neoplasms can share overlapping characteristics. Histopathological assessment focuses on epithelial organization, cellular morphology, nuclear atypia, mitotic activity, stromal changes, and evidence of invasion. Benign lesions generally preserve orderly cellular architecture and lack destructive stromal invasion. Borderline tumors may demonstrate epithelial

proliferation and atypia without destructive invasion, whereas invasive carcinomas exhibit malignant growth patterns and tissue infiltration.

Diagnostic approaches, complications, and principles of clinical management: The diagnosis and management of ovarian cysts require an integrated approach that considers the patient's clinical presentation, age, reproductive status, imaging findings, and the morphological characteristics of the lesion. The primary objectives are to identify cysts that are likely to resolve spontaneously, recognize lesions associated with complications, and detect suspicious features that may indicate an ovarian neoplasm. An individualized diagnostic strategy helps avoid unnecessary interventions while ensuring that clinically significant conditions receive appropriate attention. Ultrasonography is the first-line imaging method for evaluating most ovarian cysts. Transvaginal ultrasonography provides detailed visualization of the ovarian structure and enables assessment of cyst size, shape, wall thickness, internal echogenicity, septations, solid components, and blood flow. Simple cysts are typically unilocular, thin-walled, and filled with anechoic fluid, with no solid components. These characteristics generally suggest a benign lesion. In contrast, irregular walls, papillary projections, solid areas, multiple septations, and increased vascularity may require additional evaluation. Nevertheless, no single ultrasound characteristic can establish a definitive diagnosis in every case.

The management of ovarian cysts depends on their probable diagnosis, size, symptoms, and risk of malignancy. Many functional cysts resolve spontaneously and can be managed through observation and repeat ultrasonography when clinically appropriate. Persistent, enlarging, symptomatic, or morphologically suspicious lesions may require specialist assessment and consideration of surgical treatment. Laparoscopic surgery is often preferred for appropriately selected benign lesions because it generally involves smaller incisions and a shorter recovery period. When malignancy is suspected, the patient should be referred to a gynecological oncology specialist for appropriate evaluation and treatment planning.

Several complications may influence management decisions. Ovarian torsion can interrupt the blood supply to the affected ovary and requires urgent assessment. Cyst rupture may cause acute pain and, in some cases, significant internal bleeding. Large cysts can also exert pressure on adjacent pelvic structures. Sudden severe abdominal or pelvic pain, especially when accompanied by vomiting, faintness, or signs of blood loss, requires immediate medical evaluation.

Conclusion

Ovarian cysts are common gynecological conditions characterized by diverse clinical manifestations and morphological features. Accurate diagnosis requires comprehensive clinical assessment, ultrasonography, and, when indicated, histopathological examination. Understanding the structural characteristics and biological behavior of ovarian cysts is essential for distinguishing benign lesions from potentially malignant formations. Early detection and individualized management help prevent complications, preserve ovarian function, and protect reproductive health. Therefore, an integrated clinical and morphological approach plays a crucial role in improving diagnostic accuracy and ensuring appropriate treatment outcomes in women with ovarian cysts.

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