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Histological Estimation of Ovaries Cystic Lesions in Iraqi Patients' Women

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Abstract

Ovarian cystic lesions are one of the most common pathologic disorders in gynecology and a common reason for surgery. The purpose of the study was to determine the histopathologic characteristics of benign cystic ovarian lesions and their correlation to age, type, laterality, locularity, and size of ovarian cystic lesions. This is a retrospective study carried out on 100 cases from the archive in the Imam Kadhimian medical city and the educational laboratories of Baghdad medical city, out of 100 patients, the most common age group that underwent cystectomy was 20-40 years old. The vast majority of the cysts were non-neoplastic (67%) while the neoplastic cysts occupy 33% of all cysts. The most common non-neoplastic cyst was corpus luteum cyst (49 (49%) out of 100), subsequently follicular cyst (11 cases (11%) out of 100) and they are most commonly encountered in the age group (20 to 40) years while the most common neoplastic cyst was matured cystic teratoma (17 cyst (17%) out of 100) in the age group (20 to 40) years subsequently serous cystadenoma (12 cysts (12%) out of 100) in the age group (41-60) years. Most of the non-neoplastic cyst (58 out of 67) was measured less than 6 cm while most of the neoplastic cyst (22 out of 33) measured more than 6 cm and both appear slightly more frequent in the age group (20-40) years.

Keywords: ovary, cystic lesion, women, benign, histology

التقييم النسيجي لآفات كيس المبيض لدى النساء العراقيات

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الخلاصة

الآفات الكيسية المبيضية هي واحدة من الاضطرابات المرضية الأكثر شيوعاً لدى النساء وسبب شائع للعمليات الجراحية. وكان الغرض من الدراسة هو تحديد الخصائص النسيجية المرضية لآفات المبيض الكيسي الحميدة وعلاقتها بالعمر والنوع والجانبية وتعدد الاكياس والحجم. اجريت هذه الدراسة بأثر رجعي على 100 مريضة من بيانات أرشيف قسم علم الأمراض بين فبراير 2020 وسبتمبر 2021. تم تلوين الشرائح النسيجية بمادة H & E وأجري التحليل الإحصائي باستخدام نظام SPSS. اظهرت الدراسة بأن الغالبية العظمى من الآفات الكيسية كانت غير ورمية بنسبة 67% بينما كانت نسبة الاكياس الورمية 33%. كان الكيس الغير ورمي الأكثر شيوعاً هو كيس الجسم الاصفر (49%) يليه الكيس الجريبي (11%) وكانت هذه الآفات اكثر

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شيوعا في الفئة العمرية بين 20 و 40 سنة بينما كان الكيس الورمي الاكثر شيوعا هو الورم المسخي الكيسي الناضج (17%) لدى الفئة العمرية بين 20 و 40 سنة يليه الورم الغدي الكيسي المصلي (12%) لدى الفئة العمرية بين 41 و 60 سنة. معظم التكيسات الغير ورمية كانت بحجم اقل من 6 سم بينما كان قياس معظم التكيسات الورمية اكثر من 6 سم وخاصة لدى الفئة العمرية بين 20 و 40 سنة.

Introduction

Ovarian cysts are sacs filled with fluid in the ovaries that can be uncomplicated or complicated in nature. They are common findings discovered by chance during a physical examination or imaging. Rupture, hemorrhage, and torsion, all of which are considered gynecological emergencies, can complicate ovarian cysts. To avoid high morbidity and mortality, it is critical to diagnose and treat them as soon as possible[1]. Non-neoplastic cysts, inflammations, and neoplasms are the three types of ovarian cystic lesions that are surgically important. Non-neoplastic cysts are sufficiently common during the reproductive age; cysts up to 6 cm, detected by ultrasound, can be followed and most will solve spontaneously, reflecting their functional nature[2]. The cystic lesion in the ovary can cause anxiety in women. These cysts can occur at any age during female life[3].

In general, cysts are unfamiliar in children and adolescents as studies have shown that approximately 2% of ovarian tumors occur in children[4], [5]. The majority of the benign cysts of the ovary appear in the childbearing age population, while malignant cystic lesions are more frequent in elderly women[6]. Cystic ovarian lesions can be asymptomatic accidental findings discovered after a gross or microscopic examination of the ovary, or they might be linked to a pelvic mass, discomfort, or signs of hormonal disturbance [7]. Ovarian cyst can undergo rupture without symptoms or associated with acute abdominal pain [8]. Because of its low cost, availability, and sensitivity in detecting adnexal cysts and hemoperitoneum, ultrasonography is the primary imaging modality for examining gynecologic structures[9], [10]. The aim of the study was to determine the histopathologic characteristics of benign cystic ovarian lesions and their correlation to age, type, laterality, locularity, and size of ovarian cystic lesions.

Materials and Methods:

1- Sample source

This study was carried out as a retrospective systematic investigation with data gathered from archived documents in the pathology department of the Al-Imamain Al- Kadhmain medical city and the educational laboratories of Baghdad medical city.

2- Histological preparation

One hundred cases were obtained (from February 2020 to September 2021) included Formalin-fixed, paraffin-embedded tissue blocks of patients who underwent ovarian cystectomy and total abdominal hysterectomy with bilateral oophorectomy. Microsections with a thickness of 4-5 microns were placed on glass slides and stained with conventional Hematoxylin and Eosin stains according to protocol. Before final reporting, all slides were inspected by at least two pathologists. WHO criteria were used to classify all lesions[11]. All cystic lesion of the ovary were selected in the study while the malignant lesions were excluded.

Results

A total of 100 cases were investigated. The participants in the study ranged in age from less than 19 to more than 60 years old. Among the cases of the study, 13 (13%) of cases being <19 years old, 57 (57%) being between 20 and 40 years, 29 (29%) being between 41 and 60

years, and just 1 (1%) being beyond 60 years old (table 1). Out of 100 cases 96 (96%) were unilateral and 4 cases (4%) were bilateral (Figure 1). The cystic lesions of the ovary were broadly classified as non-neoplastic and benign neoplastic cysts and there were 67 cases of non-neoplastic cystic lesions and 33 cases of benign neoplastic cystic lesions (Figure 2). As regard the gross findings, the smallest cyst was measured 2 cm and the largest one was measured 35cm. Sixty-nine cysts (69%) were measured between 2 and 6 cm, while 31 cysts (31%) measured more than 6 cm as shown in the Figure 3. There were 96 (96%) unilocular and 4 (4%) multilocular cysts (Figure 4). The frequency of the histopathologic diagnosis was shown in (table 2). Out of 67 non-neoplastic cysts, 6 types of cysts were identified including corpus luteum cyst 49 cases, endometriotic cyst 5, follicular cyst 11, tuberculous cyst 1 and ovarian torsion 1 as shown in (Figure 5). Among benign neoplastic cysts, 3 types of cysts were identified out of 33 including mature cystic teratoma 17 (52%), serous cyst adenoma 12 (36%), and mucinous cyst adenoma 4 (12%) as shown in (Figure 6). The microphotographs in Figures from 7 to11 demonstrate the histological pattern of several cysts observed throughout our research.

Table 1: The distribution of the cases according to the age

Age groups in years	Numbers of cases	Cases (%)
<19	13	13
20-40	57	57
41-60	29	29
>60	1	1
Total	100	100

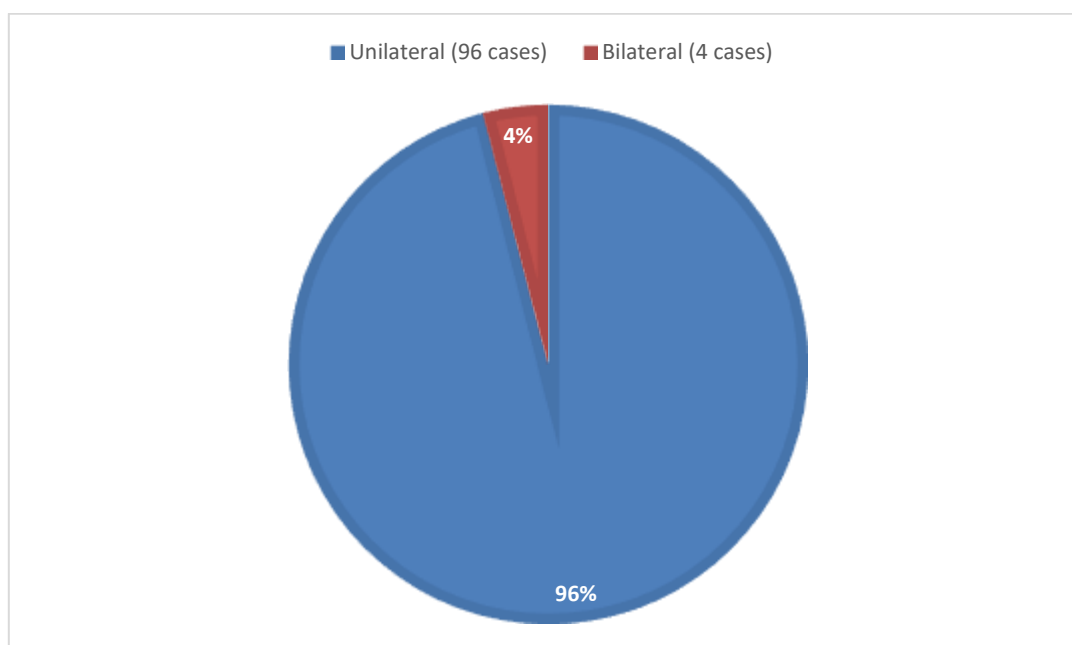


Figure 1: Laterality of cystic lesions of the ovary.

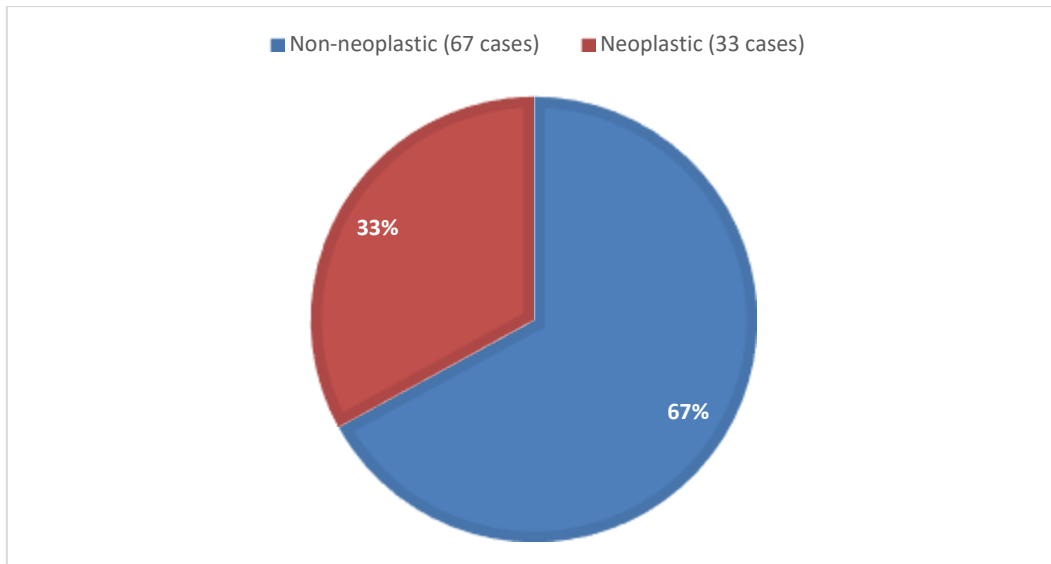


Figure 2: The distribution of the ovarian cystic lesions according to the histopathologic type.

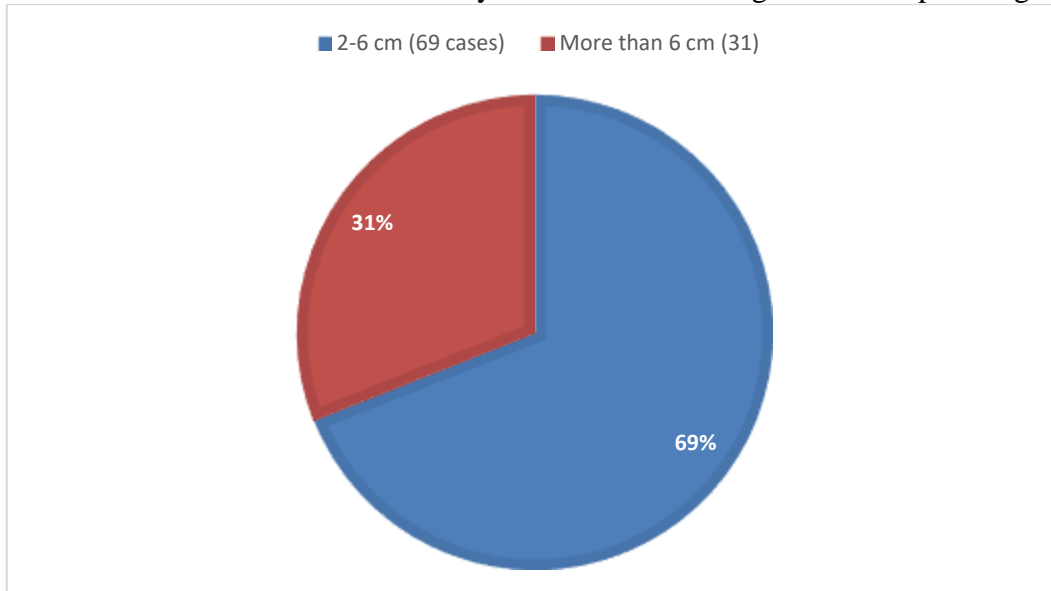


Figure 3: Frequency of ovarian cystic lesions according to the size.

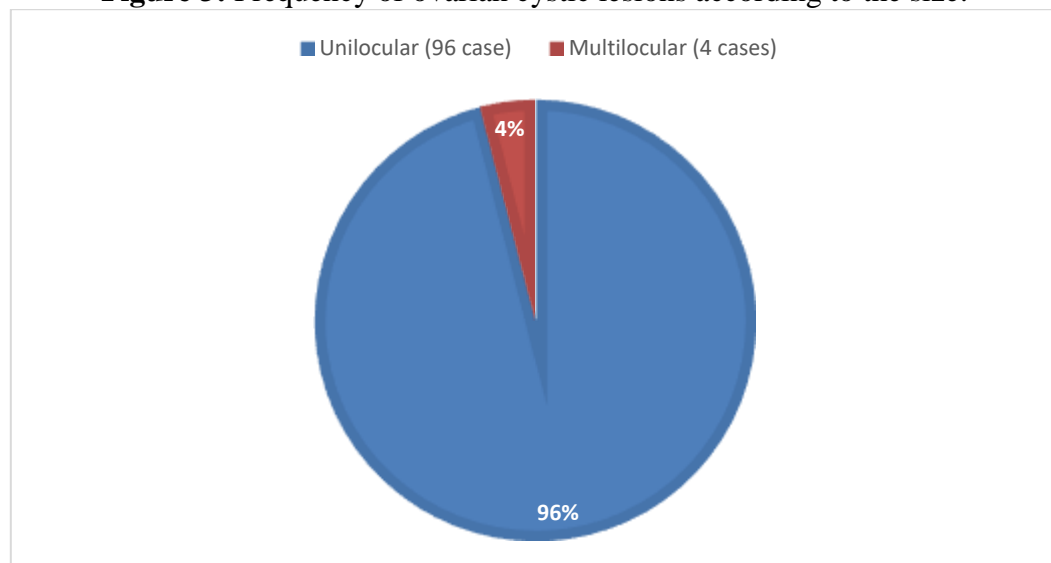


Figure 4: Locularity of the ovarian cystic lesions.

Table 2: the frequency of the ovarian cysts according to histopathologic diagnosis

Diagnosis	Number of cases	Percentage
Corpus luteum cyst	49	49
Endometriotic cyst	5	5
Follicular cyst	11	11
Mature cystic teratoma	17	17
Mucinous cystadenoma	4	4
Ovarian torsion	1	1
Serous cystadenoma	12	12
Tuberculous cyst	1	1
Total	100	100

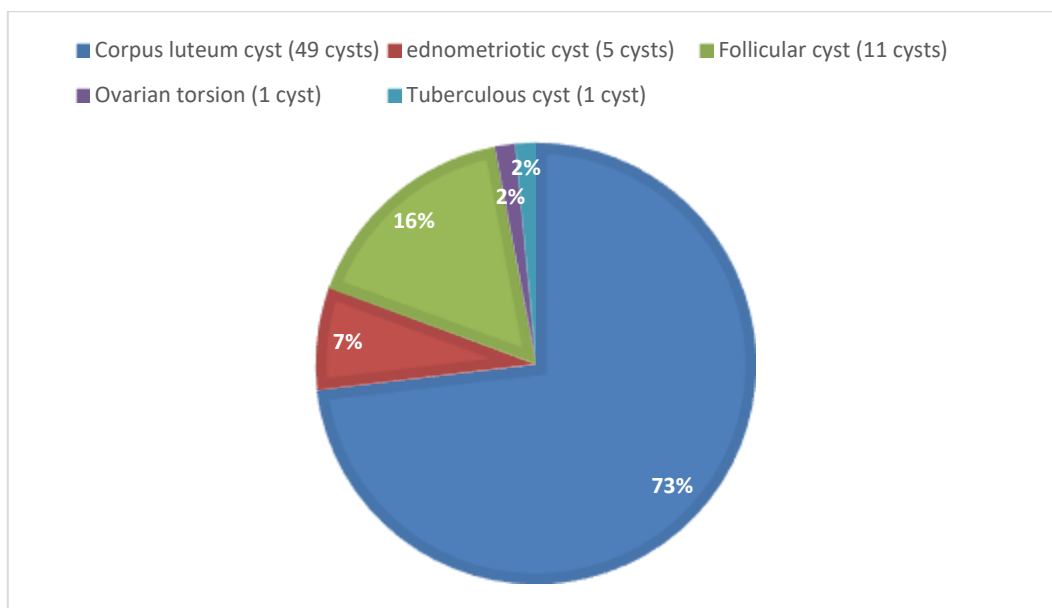


Figure 5: Frequency of the non-neoplastic cysts.

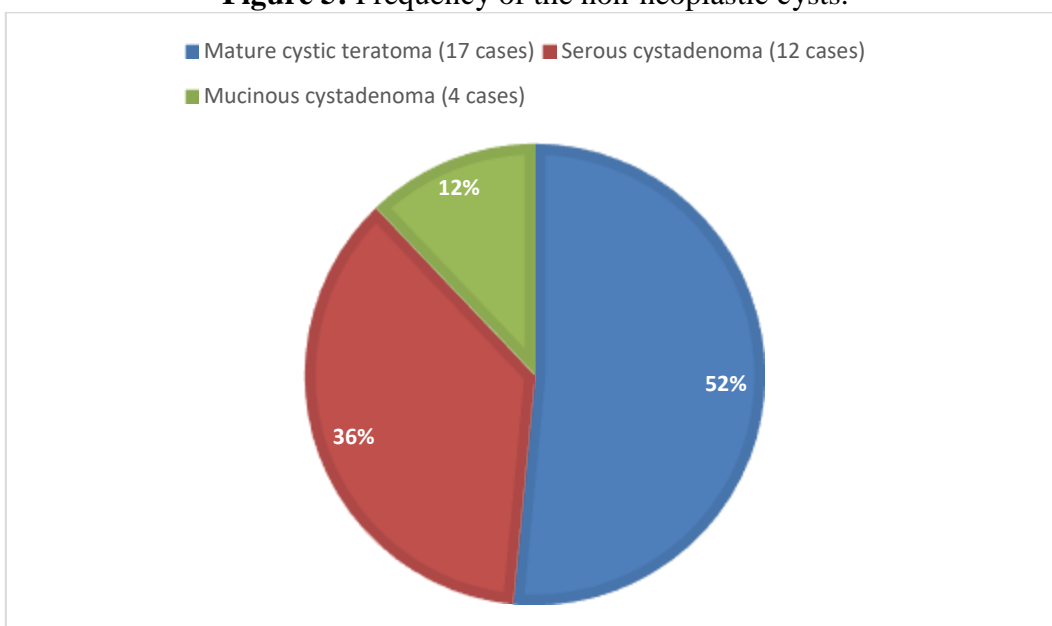


Figure 6: Frequency of benign neoplastic cysts

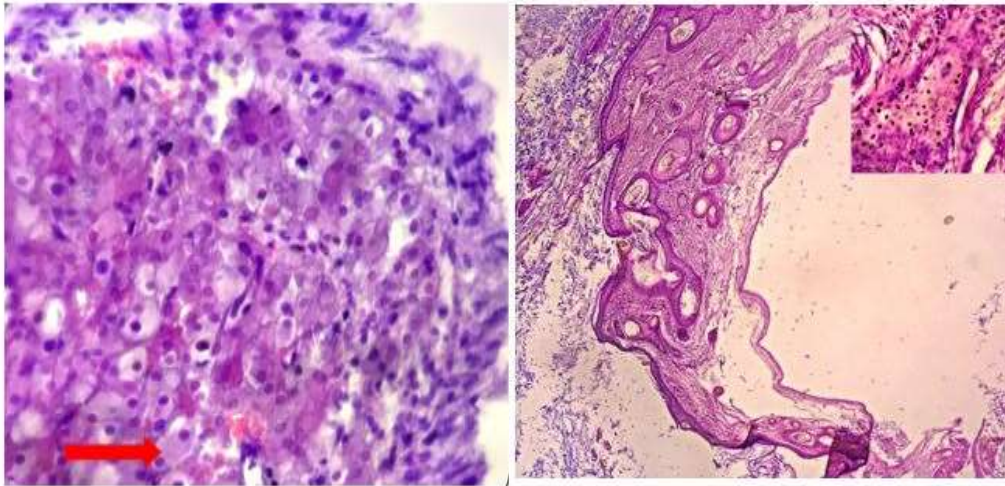


Figure 7: section in the ovary shows corpus luteum cyst with marked lutenization of granulosa cells (red arrow), (H and E , 40X, transverse cut section).

Figure 8: Low power view of mature cystic teratoma showing cyst wall lined by squamous epithelium, hair follicles and sebaceous glands (H and E, 10X); inset showing high power view of sebaceous glands (H and E, 40X)

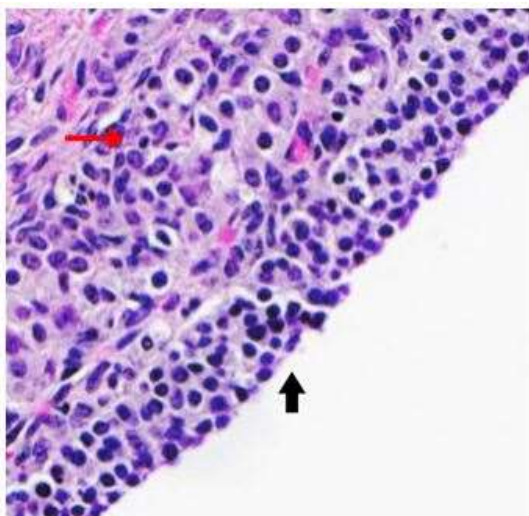


Figure 9: mucinous cystadenoma with cyst wall lined by single layer of mucinous epithelium (red arrow), (H and E, 10X)



Figure 10: Follicular cyst with a cyst wall lined by inner granulosa cells (red arrow) and outer theca cells (black arrow), (H and E, 10X)

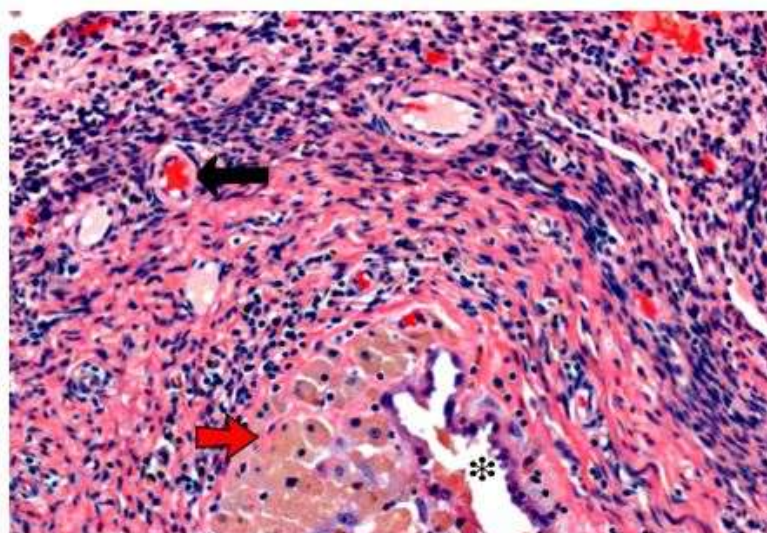


Figure 11: Endometriotic cysts show endometrial epithelium (asterisk), stroma with hemosiderin laden macrophage (red arrow) and blood vessels (black arrow), (H and E, 10x)

The current study shows that the relationship between the age, neoplastic plus non-neoplastic cysts were not significant ($p = 0.5$), indicating that cyst types can occur at any age (Table 3). The corpus luteum cyst were most common in the age group (20 to 40) in which there were 29 cysts out of 100 followed by mature cystic teratoma in the same age group (Table 4). The relation between the age group of the patients and the laterality of the cysts was not significant and the p-value was ($p=0.8$) so there was no relation between the laterality of the cysts and the patients' age (Table 5). The results demonstrate no relationship between age and the size of cysts, as shown in Table 6, where the ($p= 0.4$). The relationship between the type and size of the cysts was significant, with a ($p = < 0.00001$), implying that the larger cyst, the more likely it is neoplastic, and the smaller cyst, the more likely it is non-neoplastic (Table 7). The relationship between histopathologic diagnosis and locularity was significant, with ($p= 0.005$) and (Table 8) shows that all corpus luteum and most mature cystic teratoma in the study were unilocular. The relation between different parameter in the study is summarized in (Table 9).

Table 3: The relation between the age of the patients and the type of the cysts

	Age group	Type of the cyst		Total
		Neoplastic	Non-neoplastic	
	<19	4	9	13
	20-40	18	39	57
	41-60	10	19	29
	>60	1	0	1
	Total	33	67	100
		p-value = 0.5 $X^2 = 2$		

Table 4: The relation between the age and the histopathologic diagnosis

Diagnosis	Age group				Total
	<19	20-40	41-60	>60	
Corpus luteum cyst	6	29	14	0	49
Endometriotic cyst	0	4	1	0	5
Follicular cyst	2	5	4	0	11
Mature cystic teratoma	1	14	2	0	17
Mucinous cystadenoma	2	1	1	0	4
Ovarian torsion	1	0	0	0	1
Serous cystadenoma	1	3	7	1	12
Tuberculous cyst	0	1	0	0	1
Total	13	57	29	1	100
Percent	13%	57%	29%	1%	100%

Table 5: The relation between the age and laterality of the ovarian cyst

Age group	Laterality		Total
	Bilateral	Unilateral	
<19	0	13	13
20-40	3	54	57
41-60	1	28	29
>60	0	1	1
Total	4	96	100

p-value = 0.8 $X^2 = 1$

Table 6: The relation between the age of the patients and the size of the cyst

Age group	Size of the cyst		Total
	2-6 cm	> 6 cm	
<19	9	4	13
20-40	41	16	57
41-60	19	10	29
>60	0	1	1
Total	69	31	100

p-value = 0.4 $X^2 = 2.6$

Table 7: The relation between the type and the size of the cyst

Type	Size of the cyst		Total
	2-6 cm	> 6	
Neoplastic	11	22	33
Non-neoplastic	58	9	67
Total	69	31	100

p-value < 0.00001 $X^2 = 27.3$

Table 8: The relation between the histopathologic diagnosis and locularity of the cysts

	Locularity		Total
	Multilocular	Unilocular	
Corpus luteum cyst	0	49	49
Endometriotic cyst	0	5	5
Follicular cyst	0	11	11
Mature cystic teratoma	1	16	17
Mucinous cystadenoma	2	2	4
Ovarian torsion	0	1	1
Serous cystadenoma	0	12	12
Tuberculous cyst	1	0	1
Total	4	96	100
p-value = 0.005		X² = 20.4	

Table 9: The relation between different parameters in the study

p-value	Relation between different variables in the study				
	Age and type of the cyst	Age and laterality of the cysts	Age and size of the cyst	Type and size of the cyst	Histopathologic diagnosis and locularity of the cyst
	0.5	0.8	0.4	< 0.00001	0.005

Discussion

Ovarian cysts are a common cause of surgical procedures and hospitalizations among women worldwide. Because of the ovaries' location and the lack of symptoms associated with lesions that arise in them, these lesions typically grow to a large size before being detected and removed[12], [13]. In the present study, 57% of the cases occurred in the age group 20-40 years old. This is almost similar to the findings in the study by Pilli *et al.* showed 58.0% cases rate among women aged 20-39 years, Ramachandran *et al.* who reported 53.0% cases rate among women aged 20-39 years and Abduljabbar *et al.* (mean age was 35.35)[14]–[16]. The presented study revealed that 96 % unilateral ovarian cystic lesions and 4% bilateral cysts. This is in agreement with other studies (Kanasagara *et al.* - 94% unilateral and 6% bilateral; Misra *et al.* - 95.5% unilateral and 4.5% bilateral)[3][17]. While Zahra *et al.* found that 87% unilateral and 13% bilateral[18]. Ovarian cysts can be classified into two types: physiological and pathological. Physiological cysts are luteal cysts and follicular cyst. Pathological cysts are considered as tumor. Non-neoplastic cystic lesions are more common than neoplastic cysts. This study revealed 67% non-neoplastic cysts and 33% neoplastic cysts. This result was in concordance with the studies by Zaman *et al.* (68.87% non-neoplastic cysts and 31.12% neoplastic cysts); Ahmad *et al.* (58% non-neoplastic cysts and 42% neoplastic cysts) and Inad *et al.* (61.38% non-neoplastic cysts and 38.62% neoplastic cysts)[19][20], [21]. The size of the cyst can give an insight on the type of the cyst as a functioning non-neoplastic cyst must have a diameter of at least 3 cm but not more than 7 cm to be considered functional[22]. Ovarian neoplasms usually remain undetected until they become large enough to be identified[23]. The present study showed that the largest cyst, the more likely being neoplastic and the smallest cysts are more likely to be non-neoplastic or functional. This result was almost similar to the study by Khan *et al.* who showed that most non-neoplastic cysts measured < 8 cm and most neoplastic cysts measured > 8 cm[24]. Ovarian cysts can be

unilocular or multilocular, depending on the type of cyst; this feature aids in ultrasound diagnosis and can help determine if the cyst is pathological or functional[25]. In the present study, there were 96% unilocular and 4% multilocular cysts. The current study showed that all corpus luteum cysts are unilocular. This finding was in agreement with the study by Apurva *et al.* in which corpus luteum cysts were typically unilocular[26]. Most of the mature cystic teratoma in the study were also unilocular. A Similar finding is also present in the study by Caruso *et al.* in which 88% of teratoma were unilocular[27].

Functional cysts are not cancerous; rather, they are a variation of a normal physiologic process. Follicular and corpus luteum cysts are examples of functional cysts that are benign and usually self-limited[28]. Corpus luteum cysts were the most common non-neoplastic cysts encountered in this study (73% (49 out of 67 non-neoplastic cysts), followed by follicular cysts (16% (11 out of 67 non-neoplastic cysts)). This conclusion is consistent with the findings by Maharjan *et al.* ((70%) 14 corpus luteum cyst out of 20 cysts)[29]. However Akina *et al.* found that follicular cysts was the most common non-neoplastic cysts (45.5%) followed by corpus luteum cysts (25%)[12]. Functional cysts were the most common cysts in a study conducted by Abdul-Jabbar *et al.* in Saudi Arabia, with a 33.2 % case rate.[16]. This variation in the most prevalent form of functional cysts may be due to the varying types of cyst therapy in different centers, as these cysts can be treated medically or monitored and solved spontaneously unless they are persistent or symptomatic[30], [31] or some asymptomatic women prefer surgical removal of the cyst because of their anxiety and fear of cancer[30]–[32]. Ovarian neoplasms are classified based on the morphologic and cytologic characteristics of the tumor cells, which accurately reflect both histogenesis and underlying molecular abnormalities of various tumor subtypes[33]. The most common neoplastic cysts encountered was mature cystic teratoma (17 cases of 100) followed by serous cystadenoma (12 cases out of 100). This finding was in concordance with the study of Ranabhat *et al.* who reported 29 mature cystic teratoma out of 114 cases followed by 19 serous cystadenoma out of 114 and the study of kanasagara *et al.* (14 mature cystic teratoma out of 100 followed by 10 serous cystadenoma out of 100)[3], [34]. However, the result of the study by Arab *et al.*[35] found that serous cystadenoma was the most common neoplastic cysts (13%) followed by Mature cystic teratoma (10%)[35]. A similar result also found by Abdul-Jabbar *et al.* (47 out of 244 (19.3%) benign cyst adenoma followed by 30 out of 244 (12.3%) mature cystic teratoma)[16]. The present study does not show relationship between the age and laterality of the cyst ($p = 0.8$). The study also revealed no significant relationship between the age and the size of the cysts (p -value = 0.4) suggesting that the age cannot predict the location and the size of cysts. The diversity between the current study and other studies may be attributable to the sample size or the prevalence may varies depending on the population under investigation and the medical approach in different center.[36], [37].

Conclusion

Cystic lesions of the ovary are most commonly encountered during the reproductive age of females' life. Non-neoplastic cysts are by far more common than neoplastic cysts since most of these cysts are physiological in nature. Corpus luteum cysts are the commonest of all cysts followed by mature cystic teratoma. The smallest the size of the cyst, the more likely to be non-neoplastic because it is inactive and can be resolved spontaneously. On the other hand, cysts that tend to be large in size should be followed or removed surgically because some of these cysts can be neoplastic in nature or can be complicated by rupture or hemorrhage.

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