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Distribution of numerous histopathological kinds of surface ovarian cancers

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***Abstract*---**Introduction: Ovarian tumor considered one of the most common tumors affected the females, it represent the 6th tumor overall (4%), and 2nd most usual tumor in females international (23%). Worldwide each year, ≥225,000 women were diagnosed, and 140,000 women die from the disease. The aim of the study is to determine various histopathological and morphological variants of ovarian tumors, their size and site, age distribution, and their association with histopathological diagnosis. Method: In the cross-sectional study, histopathological reports of 285 patients who underwent surgery for removing epithelial ovarian mass and sent for pathology laboratory were collected from the archive of the teaching laboratories of Baghdad teaching hospital and Al-IMMAMAIN ALKADHIMAIN teaching hospital in Baghdad/Iraq in the period from January 2019 to October 2021. The histopathology reports were including the age and gender of the patients, site of the surgical procedure, size of the biopsy, the histopathological diagnosis, papillary growth and the stage of the malignant tumors. All the biopsied materials were fixed in 10% formalin solution, undergo routine tissue processes, were embedded into paraffin blocks, and stained with hematoxylin and eosin stains. Results: the mean age (42.6 ± 15) years , mean size of tumor (8.3 ± 6) cm, (51.2%) of patients the tumor on the left side, (24.2%) of patients at 41-50 years age group, (73.7%) of patients with 1-10 cm tumor size. (49.12%) of patients with serous cystadenoma, (15.79%) of patients with mucinous cystadenoma, (33.33%) of patients have serous cystadenoma, (20.63%) of patients have serous cystadenofibroma, (19.05%) of patients have serous cystadenocarcinoma. 1 patient with endometroid Ca. At stage (t1), 5 patients with mucinous cystadenocarcinoma at stage (t1a), 3 patients with serious

cystadenocarcinoma at stage (t3). 1 patient with serous cystadenofibrocarcinoma at stage (t3). There is a significant association between the size of the tumor and histopathological diagnosis. Conclusion: most site of ovarian tumor is the right site, most type is serous cystadenoma, most type of papillary growth is serous cystadenoma, the most size of ovarian tumor is 40 cm occur in serous cystadenofibroma, and the most age group associated with serous cystadenofibroma is 31-40 years old.

***Keywords*---**distribution, histopathological types, ovarian tumors**.**

Introduction

Ovarian tumor considered very common tumor affected the females, it represented the 6th tumor overall (4%), and 2nd most usual tumor in females international (23%) [1,2]. Worldwide each year, ≥225,000 women are diagnosed, and 140,000 women die from the disease [3]. However, there are no effective screening tests for ovarian cancer and few notable early symptoms. As a result, two-thirds of patients have advanced disease when they are diagnosed [4]. Risk factors for epithelial ovarian cancer are null parity, early menarche, late menopause, white race, increasing age, family history, personal history of breast cancer, postmenopausal hormone therapy, and Pelvic Inflammatory Disease (PID) [3]. Early detection of ovarian carcinoma is vitally to lowering the death rate. Histopathological investigation of the biopsy substantial is the support of diagnosis that defines the prediction and performance of malignancy. The WHO organization of ovarian cancers is grounded on their tissue of source and it reproduces the embryogenesis [5,6]. Serous borderline cancers define as > 10% borderline architecture, <10% borderline architecture define as “serous cystadenoma with focal epithelial proliferation”. Micro invasive foci mean minor clusters (<5 mm) alike to the epithelium in the SBT surface and enclosed by retraction spaces. Solid shells or cribriform glands cytological like “low-grade serous carcinoma (LGSC)”. SBT-micro papillary variant is today a subtype of SBT. In the newest WHO classification, peritoneal implants have been defined as invasive and noninvasive inserts. Noninvasive inserts can be related with uncertain serous cancers. Any invasive inserts are today a characteristic of LGSC [7,8]. In borderline mucinous cancers, subcategorization into intestinal and endocervical types has been detached. The object “endocervical type of mucinous borderline tumors” has been termed as “seromucinous tumor.” Furthermore, the intestinal kind of mucinous uncertain cancer is recognized as mucinous borderline tumor/atypical proliferating mucinous cancer [7,8]. (90%) of all ovarian cancer and two-thirds of entirely ovarian neoplasms are surface epithelial cancers. These cancers accept a wide collection of histological designs. Information of the kind of cancer and difference assistances injudicious organization of the patient in terms of suitable management and follow-up [9,10]. The aim of the study is to determine various histopathological and morphological variants of ovarian tumors, their size and site, and age distribution and association with histopathological diagnosis.

Method

In the cross-sectional study, pathology reports of 285 patients who underwent surgery for removing epithelial ovarian mass and sent for pathology laboratory were collected from the archive of the teaching laboratories of Baghdad teaching hospital and Al-IMMAMAIN ALKADHIMAIN teaching hospital in Baghdad/Iraq in the period from January 2019 to October 2021. The histopathology reports were including the age and gender of the patients, site of the surgical procedure, size of the biopsy , the histopathological diagnosis, papillary growth and the stage of the malignant tumors. All the biopsied materials were fixed in 10% formalin solution, undergo routine tissue processes, were embedded into paraffin blocks, and stained with hematoxylin and eosin stains. Statistical analysis done by SPSS 22, frequency and percentage used for categorical data, mean, median, and SD for continuous data. Chi-square was used for assessed association between variables, person correlation shows the correlation between continuous data. P-value less or equal to 0.05 is considered significant.

Results

A cross-sectional study of 285 patients with mean age (42.6 ± 15) years , mean size of the tumor (8.3 ± 6 cm), (51.2%) of patients the tumors are on the right side, (24.2%) of patients at the 41-50 years age group, (73.7%) of patients with 1-10 cm tumor size. As in table 1.

Table (1): distribution of patients according to the site, age groups, and Size of the tumor

variables		frequency	percentage
site	*left*	139	48.8
	right	146	51.2
Age groups (years)	*1-10*	1	0.4
	11-20	20	7.0
	21-30	52	18.2
	31-40	55	19.3
	41-50	69	24.2
	51-60	53	18.6
	>60	35	12.3
Size of tumor (cm)	1-10	210	73.7
	11-20	66	23.2
	21-30	8	2.8
	>40	1	0.4

Patients with serous cystadenoma (49.12%), (15.79%) of patients with mucinous cystadenoma (15.79%)and so on as in fig1.

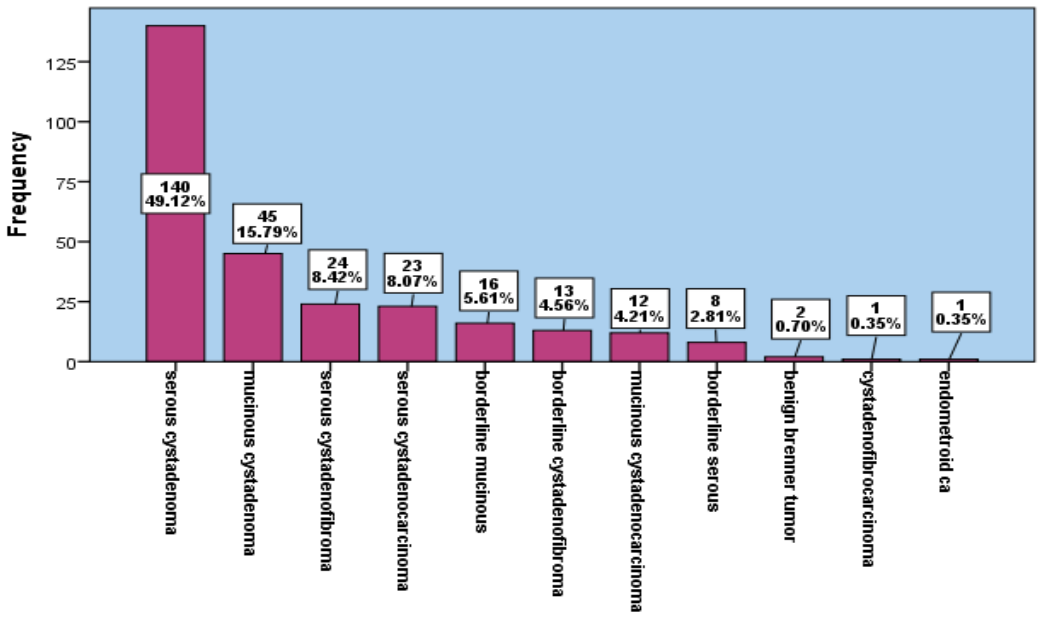

Fig 1: The distribution of histopathological types

The distribution of tumors has papillary growth, (33.33%) of patients have serous cystadenoma, (20.63%) of patients have serous cystadenocarcinoma, (19.05%) of patients have serous cystadenofibroma. And so on. As in fig 2.

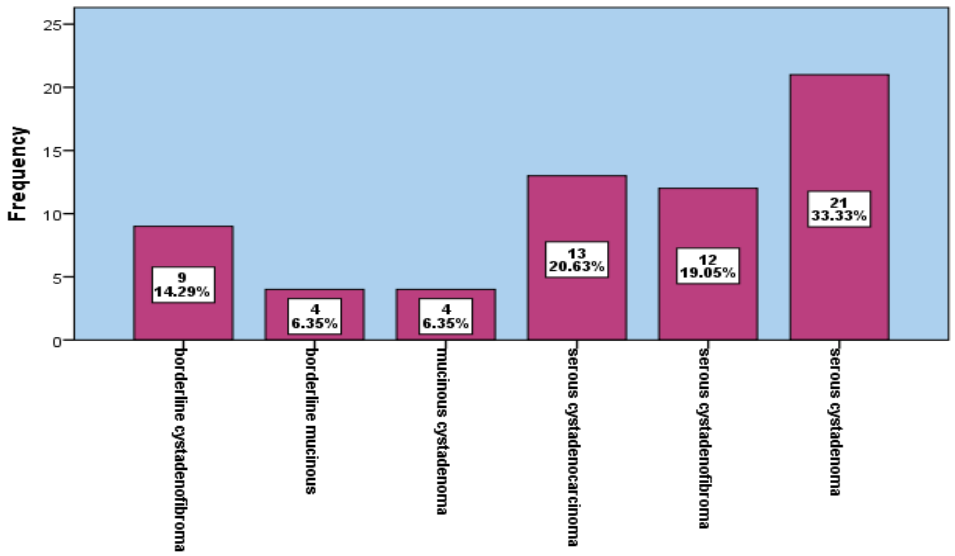

Fig 2: The distribution of tumors has papillary growth

The distribution of histopathological diagnosis of patients according to the stage, 1 patient with endometroid Ca. At stage (t1), 5 patients with mucinous cystadenocarcinoma at stage (t1a), 3 patients with serous cystadenocarcinoma at stage (t3). 1 patient with serous cystadenofibrocarcinoma at stage (t3) As in table 2.

Table (2): Distribution of histopathological diagnosis of patients according to stage

Stage	Diagnosis					Total
	Endometroid ca	Mucinous cystadenocarcinoma	Serous cystadenocarcinoma	Serous cystadenofibrocarcinoma	Transitional cell carcinoma	
t1	1	1	0	0	0	2
t1a	0	5	0	0	0	5
t1b	0	0	3	0	0	3
t1c	0	1	4	0	0	5
t2	0	1	1	0	0	2
t2a	0	1	0	0	0	1
t2b	0	0	2	0	0	2
t2c	0	1	0	0	0	1
t3	0	0	3	1	0	4
t3a	0	0	1	0	0	1
t3c	0	1	0	0	0	1
Total	1	11	14	1	0	27

There is no significant association between the site of the tumor and histopathological diagnosis. As shown in table 3.

Table (3): Association between site and histopathological diagnosis

Diagnosis	Site	
	Left	Right
Benign brenner tumor	1 (0.7%)	1 (0.7%)
Borderline cystadenofibroma	8 (5.8%)	5 (3.4%)
Borderline mucinous	10 (7.2%)	6 (4.1%)
Borderline serous	3 (2.2%)	5 (3.4%)
Serous cystadenofibrocarcinoma	0 (0%)	1 (0.7%)
Endometroid ca	0 (0%)	1 (0.7%)
Mucinous cystadenocarcinoma	7 (5.0%)	5 (3.4%)
Mucinous cystadenoma	23 (16.5%)	22 (15.1%)
Serous cystadenocarcinoma	14 (10.1%)	9 (6.2%)
Serous cystadenofibroma	11 (7.9%)	13 (8.9%)
Serous cystadenoma	62 (44.6%)	78 (53.4%)
	139 (100%)	146 (100%)

P-value= 0.75.
P-value ≤0.05 (significant).

There is a significant association between the size of the tumor and histopathological diagnosis. One patient with the size of tumor more than 40 cm is serous cystadenofibroma, (57.6%) of patients with the size of tumor 1-10 cm serous cystadenoma. As shown in table 4,

Table (4): Association between size and histopathological diagnosis

Diagnosis	Size			
	1-10	11-20	21-30	>40
Benign Brenner tumor	2 (1%)	0 (0%)	0 (0%)	0 (0%)
Borderline cystadenofibroma	7 (3.3%)	6 (9.1%)	0 (0%)	0 (0%)
Borderline mucinous	8 (3.8%)	6 (9.1%)	2 (25%)	0 (0%)
Borderline serous	3 (1.4%)	4 (6.1%)	1 (12.5%)	0 (0%)
Serous cystadenofibrocarcinoma	1 (0.5%)	0 (0%)	0 (0%)	0 (0%)
Endometroid ca	0 (0%)	1 (1.5%)	0 (0%)	0 (0%)
Mucinous cystadenocarcinoma	7 (3.3%)	2 (3%)	3 (37.5%)	0 (0%)
Mucinous cystadenoma	27 (12.9%)	17 (25.8%)	1 (12.5%)	0 (0%)
Serous cystadenocarcinoma	17 (8.1%)	6 (9.1%)	0 (0%)	0 (0%)
Serous cystadenofibroma	17 (8.1%)	6 (9.1%)	0 (0%)	1 (100%)
Serous cystadenoma	121 (57.6%)	18 (27.3%)	1 (12.5%)	0 (0%)
Total	210 (100%)	66 (100%)	8 (100%)	1 (100%)

P-value= 0.0001.
P-value ≤0.05 (significant).

There is a significant association between age groups and histopathological diagnosis. One of the patients in the age group 1-10 years is serous cystadenoma, (56.6%) of patients in the age group 31-40 years are serous cystadenofibroma. As shown in table 5.

Table (5): association between age groups and histopathological diagnosis.

Diagnosis	age						
	1-10	11-20	21-30	31-40	41-50	51-60	>60
Benign Brenner tumor	0 (0%)	1 (5%)	0 (0%)	1 (1.8%)	0 (0%)	0 (0%)	0 (0%)
Borderline cystadenofibroma	0 (0%)	4 (20%)	2 (3.8%)	2 (3.6%)	0 (0%)	2 (3.8%)	3 (8.6%)
Borderline mucinous	0 (0%)	1 (5%)	4 (7.7%)	7 (12.7%)	3 (4.3%)	1 (1.9%)	0 (0%)
Borderline serous	0 (0%)	0 (0%)	0 (0%)	2 (3.6%)	2 (2.9%)	3 (5.7%)	1 (2.9%)
Cystadenofibrocarcinoma	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (1.4%)	0 (0%)	0 (0%)
Endometroid ca	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (2.9%)
Mucinous cystadenocarci	0 (0%)	0 (0%)	2 (3.8%)	2 (3.6%)	4 (5.8%)	0 (0%)	4 (11.4%)

	noma							
	Mucinous cystadenoma	0 (0%)	1 (5%)	11 (21.3%)	8 (14.5%)	12 (17.5%)	10 (18.9%)	3 (8.6%)
	Serous cystadenocarcinoma	0 (0%)	1 (5%)	1 (1.9%)	1 (1.8%)	5 (7.3%)	8 (15.1%)	7 (20%)
	Serous cystadenofibroma	0 (0%)	1 (5%)	5 (9.6%)	1 (1.8%)	5 (7.2%)	8 (15.1%)	4 (11.4%)
	Serous cystadenoma	1 (100%)	11 (55%)	27 (51.9%)	31 (56.6%)	37 (53.6%)	21 (39.5%)	12 (34.2%)
Total		1 (100%)	20 (100%)	52 (100%)	55 (100%)	69 (100%)	53 (100%)	35 (100%)

P-value= 0.048. P-value ≤0.05 (significant).

Discussion

The highest occurrence of ovarian cancers in the current study was in the 5th decade (25%) which was actual like to the comments of Valson et al stated about 31% cases in the 5th decade. Jha and Karki et al. In 2008 and Kuldeepa et al in 2011 stated a extreme number of cases in the 3rd decade of life with 27% cases and 37% cases in the 3rd decade correspondingly [5,11]. The mean age of the current study is 42.6 ± 15 years old, mean size of tumor 8.3 ± 6 cm, this is similar to other studies stated that the mean age of patients in the epithelial tumor, germ cell tumor, sex cord-stromal tumor, and others category was "38.1 ± 12.6, 28.4 ± 17.7, 39.3 ± 18.6, and 45.2 ± 7.8 years with the age range of 15–76 years, 6 days–84 years, 15–60 years, and 38–58 years", correspondingly. Respectively groups dispersed as per developing life phases or age group and the mean size of the tumor in the epithelial tumor, germ cell tumor, sex cord-stromal tumor, and others category was "11.2 ± 6.9 cm, 11.5 ± 4.8 cm, 8.5 ± 2.8 cm, 9.2 ± 5.3 cm with the size range of 1–30 cm, 4–24 cm, 4–12 cm, and 5.4–13 in cm, correspondingly" [8]. In the current study (51.2%) of patients the tumor on the right side, (24.2%) of patients at 41-50 years' age group, also this is similar to other studies that of The 141 surface epithelial tumors, The mean age of diagnosis in our study was 42.4 years, Right-sided tumors (59.8%) were more common than left-sided tumors (40.14%) [10]. In the current study (49.12%) of patients with serous cystadenoma, (15.79%) of patients with mucinous cystadenoma, also this is similar to other study stated that the greatest communal cancer general was "benign serous cystadenoma (19%) then benign mucinous cystadenoma (15%) and mature teratoma (13%)". Garg *et al.*, Patil *et al.*, and Modepalli and Venugopal had alike outcomes [10,12,13]. However, in Mankar and Jain mucinous cystadenoma (33%) was the utmost common cancer [14]. In the current study, the utmost common cancer was serous carcinoma. These findings are in concordance with those of a study carried out by Kanpurwala *et al.*, Garg *et al.*, and Modepalli and Venugopal [10,15]. Mondal *et al.*, the borderline serous cancer was the commonest borderline cancer [16]. In current study, (100%) of patients with the size of cancer of more than 40 cm are serous cystadenofibroma, (57.6%) of patients with the size of tumor 1-10 cm serous cystadenoma. This is agreed to another study that states the extreme sum (42%) of patients were in the size range of 5–10 cm which is comparable to the study directed by Manoja *et al* [18].

In our study, there is a significant association between age groups and histopathological diagnosis. (100%) of patients in the age group, 1-10 years is serous cystadenoma, (56.6%) of patients in the age group 31-40 years is serous cystadenofibroma. This is similar to another study that states that most of the ovarian tumors are seen in the age group from 16 to 20 years (120 cases) i.e. 80%. Only three cases were seen in the age group up to five years of age (2%). Amongst the benign tumors serous cystadenoma are seen in all age groups. But mucinous tumors are seen beyond 10 years of age. [19]. In this study, the utmost common cancer general was serous carcinoma then mucinous carcinoma. This conclusion related well with the revisions of numerous authors. Stimulatingly, in a study by Garg *et al.* And Kanpurwala *et al.*, the second common cancer was granulosa cell tumor [8,20,21].

Conclusion

Most site of ovarian tumor is the right side, most type is serous cystadenoma, most type of papillary growth is serous cystadenoma, the most size of the ovarian tumor is 40 cm occur in serous cystadenofibroma, and the most age group associated with serous cystadenofibroma is 31-40 years old.

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