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Histopathological spectrum of ovarian lesions in a tertiary care centre: A retrospective study

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Abstract
Background: A broad range of pathological conditions including non-neoplastic and neoplastic lesions are commonly encountered in the ovary in routine practice. Majority of the ovarian neoplasms are benign and is also a common site for malignancy, even though metastasis can occcur. Ovarian cancer is the third most common cancer among women in India. Histopathological examination plays a major role in diagnosing these lesions.
Aim: The aim of present study is to assess the frequency of ovarian lesions and to study the gross and histopathological patterns of different ovarian lesions.
Materials and Method: The present study is a retrospective study conducted for a period of 2 months. Clinical data, gross findings and histopathology slides were retrieved using simple random sampling technique. A total of 100 cases were studied. Results thus obtained was analysed using SPSS 20.0 version.
Results: Of the 100 ovarian lesions, 64% were non-neoplastic lesions and 36% were neoplastic. Age group ranges from 20 to 82 years with fourth decade being the most common age group affected in our study. 83% of ovarian lesions are cystic, 11% are solid and 6% are partly solid and cystic. Among the non-neoplastic lesions surface inclusion cysts were more common (43.8%). Out of all the ovarian neoplasms surface epithelial tumours were most common 30 out of 36 cases (83.3%) followed by germ cell tumours (16.7%). Benign tumours are more common compared to their malignant counterpart.
Conclusion: Ovarian lesions show diverse histological types due to its complex architecture. Non-neoplastic lesions are more common than the neoplastic lesions. Histopathological examination is necessary in diagnosing and categorizing all ovarian lesions for proper treatment and patient care.

Keywords: Ovarian tumours, neoplastic, non-neoplastic, surface epithelial tumours, germ cell tumours

Introduction

The ovaries are paired organs located on either side of the uterus close to the lateral pelvic wall. Oocyte production and hormone synthesis are the main functions of ovaries. Even though ovaries are small in size, it is an organ with complex structure and are a most common site for benign and malignant neoplasms [1]. 80% of the ovarian neoplasms are benign and it is also a common site for primary malignancy, although metastasis to ovaries can also occur [2].

Ovarian diseases of surgical importance can be broadly divided into non-neoplastic cysts and neoplasms. Non-neoplastic cysts are sufficiently common during the reproductive years. Neoplastic lesions may be benign, borderline or malignant [3]. Tumour of ovary are classified based on the tissue of origin as Surface Epithelial tumours (serous, mucinous, clear cell, endometrioid, brenner, and seromucinous), germ cell tumours, sex cord-stromal tumours, metastatic tumours and miscellaneous [4].

Ovarian cancer is the 7th most common cancer and 8th most common cause of death from cancer in women in the world. Ovarian cancer is the third most common cancer among Indian women after breast and cervix cancer and constitutes about 6% of total cancer cases among the Indian women and is associated with high mortality rate [5].

Ovarian tumours may create confusion to the pathologists because of the wide spectrum of clinical, radiological and morphological features. Certain nonneoplastic lesions of ovary frequently present as a pelvic mass and are often associated with abnormal hormonal manifestations, thus mimicking ovarian neoplasm. Gross features also help in differential diagnosis. Most benign tumours of epithelial category and non-neoplastic cysts are cystic, on the other hand, solid areas and papillary projections indicates malignancy [1].

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Accurate diagnosis primarily depends on the wide range of microscopic features they exhibit. As the diagnosis and prognosis of ovarian tumors depend upon its histological type, determination of histological patterns of ovarian tumors is very important for management of the patient.

Aims and objectives
- To study the frequency, age distribution and histopathological patterns of ovarian lesions.

Materials and methods
Study setting: Present study was conducted in Department of Pathology, Sree Mookambika Institute of Medical Sciences, and Kulasekharam

Study Design: Retrospective study (Data collected from September 2020 to August 2021 using simple random sampling technique).

Sample size: 100

Study Duration: 2 months

Inclusion Criteria: All ovarian specimens (solitary specimen of ovary and part of hysterectomy specimens) with histo-pathologically proven non-neoplastic and neoplastic lesions.

Exclusion Criteria: Normal ovaries, post chemotherapy specimens and metastatic ovarian tumors.
Clinical data and histopathology slides along with request were collected retrospectively using simple random sampling technique. A total of 100 cases were selected. H&E slides were reviewed, histopathological details were recorded and compared with clinical data. Statistical Analysis was carried out using SPSS 20.0 version.
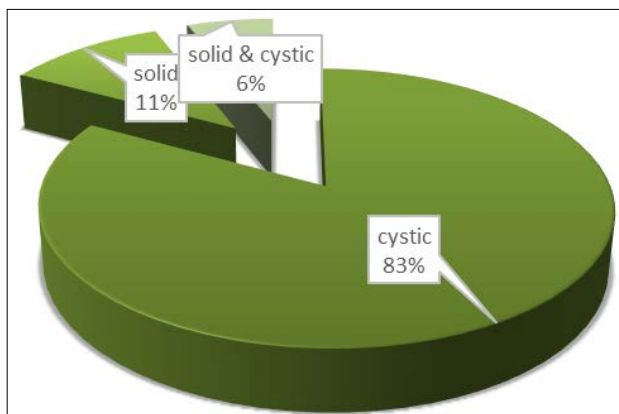
Observation and results
The following results were obtained. Of the 100 ovarian lesions included in the study, 64% were non-neoplastic lesions and 36 % were neoplastic lesions.
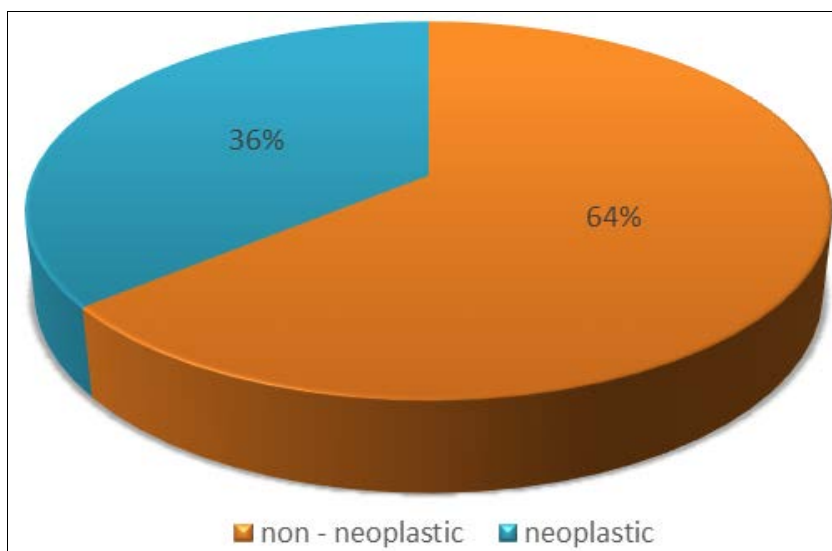
Fig 1: Distribution of Ovarian Lesions.

Out of the 100 ovarian lesions 83% of the lesions were cystic followed by 11% were solid and 6% were solid and cystic. Majority of the cystic lesions were non neoplastic and malignant lesions shows solid and cystic appearance. Within the cystic tumors, benign serous tumors showed uniloculated cysts whereas in benign and borderline mucinous tumors multiloculation was the common finding.

Fig 2: Distribution of Gross Morphology.

In our study the age distribution was between 20 to 82 years. Ovarian lesions were more common in the age group of 41 to 50 years (50%). Maximum number of non-neoplastic lesions (38%) and benign ovarian tumors(8%) were seen in 41 to 50 years. Maximum number ofmalignant tumors (3%) were seen in 41 to 50 years and 61 to 70 years. Table 1 represents the agewise distribution of ovarian lesions.
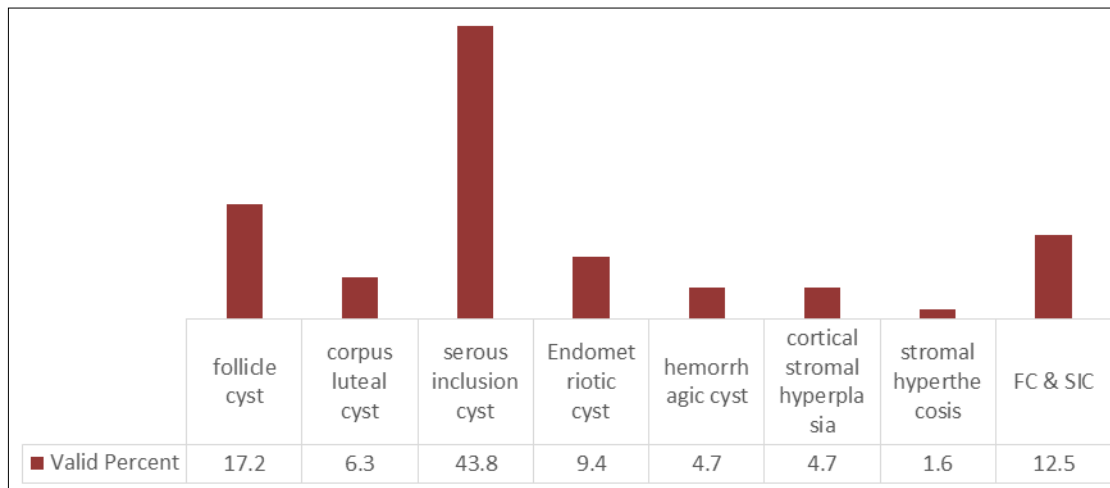
Table 1: Age-wise distribution of ovarian lesions.

Age in years	Non neoplastic	Benign	Borderline	Malignant	Total
11-20	0	0	0	1	1
21-30	2	4	0	0	6
31-40	10	4	0	2	16
41-50	38	8	1	3	50
51-60	8	4	0	2	14
61-70	5	2	0	3	10
>71	1	1	0	1	3
	64	23	1	12	100

Most of the non-neoplastic lesions were incidental findings. The most common non-neoplastic lesion found in our study was surface inclusion cysts (43.8%) followed by follicle cyst (17.2%). Both cysts were seen in 12.5% of the cases.

	follicle cyst	corpus luteal cyst	serous inclusion cyst	Endometriotic cyst	hemorrhagic cyst	cortical stromal hyperplasia	stromal hyperthecosis	FC & SIC
■ Valid Percent	17.2	6.3	43.8	9.4	4.7	4.7	1.6	12.5

Fig 3: Distribution of Non-Neoplastic lesions.

Out of all the ovarian neoplasms (36 cases), Surface epithelial tumors (83.3%) were more common followed by germ cell tumors (16.7%). Among the surface epithelial tumors (30 cases), most of the benign surface epithelial tumors were serous cystadenoma (11/30cases) followed by mucinous cystadenoma (4/30 cases). Among the malignant surface epithelial tumors serous cystadenocarcinoma (7/30 cases) were commonly seen. (Table: 2)

Table 2: Distribution of Surface Epithelial tumors.

Surface epithelial tumors	Serous	Mucinous	Endometrioid	Clear cell	Sero-mucinous	Brenner
Benign	11	4	0	0	2	1
Borderline	0	1	0	0	0	0
Malignant	7	2	1	1	0	0
Total	18	7	1	1	2	1

Germ cell tumors constituted about 16.7% (6/36 cases) of the ovarian neoplasms. Among that 5 cases were mature teratoma and 1 was immature teratoma. (Table: 3).

Table 3: Distribution of Germ cell tumors.

Germ cell tumors	Frequency	Percentage
Mature teratoma	5	83.3%
Immature teratoma	1	16.7%
Total	6	100 %

Discussion
A total of 100 cases were included in the study. In our study most common lesions were non-neoplastic 64%. This is similar to that of study conducted by Kreuzer GF et al. [6] where majority of the ovarian lesions were non neoplastic.

Out of the 100 ovarian lesions 83% of the lesions were cystic. Majority of the cystic lesions were non neoplastic and benign ovarian tumors. Malignant tumors were partly solid cystic and few were solid. Data are comparable with studies done by Prabhakar et al. [7] and Pilli et al. [8] both studies did not report solid consistency in borderline tumors, which is similar to our study. Study conducted by Patel et al. [9] also mentioned that malignant tumors were cystic and solid.

The most common age group affected in our study was 41 to 50 years (50%) followed by 31 to 40 years. This is comparable to studies done by Mohan et al. [10] and Srinivasan et al. [11]

Among the Non-neoplastic lesion, serous inclusion cyst were the most common lesion in our study followed by follicle cyst. The present study was in contrast with study conducted by Kreuzar GF et al. [6] and Guerriero et al. [12] reported that follicular cyst and endometriotic cyst was the most common non-neoplastic lesion in their study respectively.

In our study among the neoplastic lesions 60% were benign, 36.7% were malignant and 3.3% were borderline tumors. This is comparable with studies conducted by Panchonia et al. [13], Phukan et al. [14], Pilli et al. [8] and Patel et al. [9] All the studies showed that majority of the neoplastic lesions were benign followed by malignant and borderline tumors.

Surface epithelial tumour was the most common neoplastic lesion according to WHO classification of tumors of ovary [4]. In our present study, Surface epithelial tumor (83.3%) were the most common ovarian tumour followed by Germ cell tumors (16.7%). Similar observation was seen in studies done by Pilli et al. [8] and Patel et al. [9] Among 30 cases of surface epithelial tumors, Serous tumors were the most common subtype followed by mucinous type. Endometrioid, clear cell and seromucinoustumors were infrequent. This is consistent with Phukan et al., [14] Modi et al. [15] and Garget al. [16] Serous, mucinous and seromucinoustumors were more commonly benign. In contrast, endometrioid and clear cell tumors were predominantly malignant. This is comparable with studies done by Phukan et al. [14] and Modi et al. [15]. The most common neoplastic lesion was benign serous cystadenoma. This is comparable with studies done by Panchonia et al. [13] and Serous carcinoma was the most common malignant lesion in our study, consistent with studies done by Modi et al. [15] Mature cystic teratomas were common among the germ cell tumors in the present study followed by immature teratoma. Incidence is similar to studies conducted by Gupta SC et al. [17] and Couto F et al. [18]

Conclusion
An accurate diagnosis of ovarian lesions relies mainly on histopathological examination which remains the gold standard with the support of ancillary studies such as special

stains and immunohistochemistry. Clinical parameters such as laterality, age, radiological imaging and staging are other factors that help in the management and prognosis of ovarian tumors. The frequency of the distribution of neoplasms was similar to the reports in the literature. The present shows that the majority of ovarian lesions are non-neoplastic followed by benign tumors. Most common histological subtype of ovarian tumors are Surface epithelial tumors. Early diagnosis plays an important role in decreasing the mortality and morbidity.

Acknowledgments

Conflicts of interest: There are no conflicts of interest

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