Histopathological Spectrum of Ovarian Lesions in Tertiary Care Hospital

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Abstract: _Background_: _The aim of the study was to identify the pattern of pathologies involving ovarian mass which were received for histopathological evaluation at tertiary hospital in ahmedabad, Gujarat, India during the period January 2019 to December 2021._ _Aim_: _To study the Histopathological lesions of ovary and determine its frequency, histological features and age wise incidence._ _Materials and Methods_: _The data pertaining to samples of ovarian lesions received for histopathological evaluation at the laboratory of tertiary care hospital ahmedabad from January 2019 to December 2021, were analyzed to determine the pattern of pathologies diagnosed during this evaluation._ _Results_: _Non-neoplastic lesions of the ovary constituted 53 % of all cases; follicular cysts constituted 47% of these lesions. Malignant lesions constituted only 4.0% of all pathologies. Serous cystadenoma of the ovary constituted predominant neoplastic lesion diagnosed. Most patients were in 3rd to 6th decades of life.96.8% of the lesions were unilateral. The majority of ovarian lesions were benign and unilateral._ _Conclusions_: _Ovarian lesions both non neoplastic and neoplastic include a variety of morphological features and show a particular age wise incidence. The role of histopathological evaluation remains useful in diagnosis as well as management of such cases._

Keyword: Non neoplastic, Benign, Borderline, Malignant, Serous cystadenoma

1. Introduction

Ovaries are important reproductive organs, concerned with the production of progeny. Ovarian lesions (cystic or solid), may occur at any age. [1] These lesions may be non neoplastic or neoplastic in nature. Non neoplastic lesions are:

1) Simple follicular cyst,
2) Corpus leuteal cysts,
3) Chocolate cysts due to endometriosis,
4) Hemorrhagic cysts,
5) Polycystic ovarian disease (PCOD),
6) Various inflammatory lesions, etc.

Non neoplastic lesions develop almost exclusively during the childbearing years. they can be asymptomatic or can produce local discomfort, menstrual disturbances, infertility, or in rare cases can cause acute symptoms due to complications like haemorrhage, rupture or torsion. [1]

Neoplastic lesions of ovary arises mainly from:

a) Mullerian epithelium,
b) Germ cells, or
c) Sex cord stromal cells. [2]

Classification of ovarian neoplasms given by WHO is based upon the tissue of origin. It includes a variety of entities like:

1) Surface epithelial tumors,
2) Sex cord stromal tumors,
3) Pure or mixed germ cell tumors,
4) Gonadoblastoma,
5) Soft tissue tumors,
6) Metastatic tumors,
7) Unclassified tumors, etc.

Surface epithelial tumors are further classified into:

A. Benign,
B. Borderline, and
C. Malignant. [1]

Ovarian neoplasm behaves in diverse ways and generally escapes the detection until a late stage and attains a large size. This is because of, either the symptoms are vague or most of them are asymptomatic. Diagnosis of various histological patterns of ovarian lesions is very important in the treatment and prognosis. [2] [5]

Tumors of the ovary are a common neoplasm in women. [3] Ovarian cancer is the sixth most common female cancer, seen predominantly after the third decade of life. [4]

2. Aims and Objectives

- To study the frequency of ovarian lesions.
- To study their histopathological features.
- To study age wise incidence of ovarian lesions.

3.Materials and Methods

The present study was carried out in the Department of Pathology, tertiary care teaching hospital, Ahmedabad over a period of three years from January 2019 to December 2021. The materials for this study are ovarian specimen obtained from hysterectomy specimen with unilateral or bilateral adnexa, and oophorectomy and/or cystectomy specimens received in the department. Relevant clinical information regarding the age, clinical features, radiological findings and provisional diagnosis were obtained. The specimens were analyzed in detail macroscopically for various parameters like size, external surface, and consistency and cut sections with contents of cyst. The tissues were processed by routine paraffin techniques and a section stained with Haematoxylin and Eosin and microscopic examination was done. Study type was retrospective and analytical.

4.Observations and Results

The present study included 185 cases of ovarian lesions. Of these, 179 masses were unilateral (96.8%) and 6 were bilateral (3.2%). In which 98 (53%) cases were non-neoplastic and 87 (47%) cases were neoplastic ovarian lesions. The histopathological categorization was done according to the site of origin: Surface epithelial tumors, germ cell tumors, sex cord stromal tumors and metastatic tumors (Table-2). They were further divided into Benign, Borderline and Malignant tumors (Table-3). In non-neoplastic lesion 46 cases were follicular cysts (47%), 43 cases of simple cyst (44%), 5 cases of corpus luteal cyst (5%) and 4 cases of hemorrhagic cyst (4%) (Table-1). In neoplastic lesions 80 cases were Benign (92%), 3 was Borderline (3%) and 4 were Malignant (5%). In 80 benign ovarian neoplasms, 63 cases were a surface epithelial tumor (72%) which was most common seen benign lesions followed by 23 cases of germ cell tumors (27%). Out of total 63 cases of surface epithelial tumors, 26 caese were of serous cyst adenoma (Figure-1) and 18 cases were of mucinous cystadenoma (Figure-2). All 23 cases of germ cell tumors were Mature cystic Teratoma (Figure-3). The most common tumor of ovary was Benign serous cystadenoma (29.9%) followed by Mature cystic teratoma (26.4%), followed by Benign mucinous cystadenoma (20.7%). The age-wise distribution of the patients whose samples were received is given in (Table 4). Patients in the age group of 20-39 years constituted the majority of patients (93 out of 185; 50.2%) The age-wise distribution of the patients with non neoplastic and neoplastic lesion was illustrated in (Table-5) and (Table-6) respectively.

Table 1: Showing frequency of non-neoplastic lesions of ovary in the present study

Non neoplastic lesions of ovary	Number of cases	Percentage	Unilateral	Bilateral
Follicular cyst	46	46.9%	41	5
Simple cyst	43	43.9%	43	-
Corpus luteal cyst	5	5.1%	5	-
Hemorrhagic cyst	4	4.1%	4	-
Total	98	100%	93	5

Table 2: Broad group wise distribution of ovarian tumours

Broad Group Group	No. of cases	Percentageercentage
Surface Epithelial tumours	63	72.4%
Germ cell tumours	23	26.4%
Sex cord stromal tumor	1	1.1%
Metastatic tumor	0	0%
total	87	100

Table 3: Histopathological Categorization of various ovarian tumors

Site of origin	Benign/Borderline/Malignant	Histopathological category	Unilateral	Bilateral	Total	Percentage
Surface epithelial tumor	Benign	Serous cystadenoma	25	1	26	29.9%
		Mucinous cystadenoma	18	-	18	20.7%
		Serous cyst adenofibroma	6	-	6	6.9%
		Seromucinous cystadenoma	6	-	6	6.9%
		Brenner tumor	1	-	1	1.1%
		Endometrial tumor	-	-	-	-
	borderline	Mucinous tumor	3	-	3	3.4%
	Malignant	High grade serous carcinoma	2	-	2	2.3%
		Papillary serous cystadenocarcinoma	1	-	1	1.1%
Germ cell tumor	Benign	Mature cystic teratoma (dermoid cyst)	23	-	23	26.4%
	Malignant	Immature teratoma	-	-	-	-
		Yolk sac tumor	-	-	-	-
Sex cord tumor	Benign	fibrothecoma	-	-	-	-
	Malignant	Adult granulosa cell	1	-	1	1.1%

		tumor				
Metastatic tumor	Malignant	Metastatic adenocarcinoma	-	-	-	-

Table 4: Age wise distribution of patients operated for ovarian lesions

Age in years	Numbers of patients (total=185)	Patients %
0-19	15	8.1%
20-39	93	50.3%
40-59	69	37.3%
>60	8	4.3%

Table 5: Age wise distribution of non neoplastic ovarian lesions

Category	0-19 years	20-39 years	40-59 years	>60 years
Follicular cyst	2	27	15	-
Simple cyst	3	16	25	1
Corpus luteal cyst	-	4	1	-
Hemorrhagic cyst	1	2	1	-
Total	6	49	42	1

Table 6: Age wise distribution of neoplastic ovarian lesions

| Category	0-19 years	20-39 years	40-59 years	>60 years
Serous cystadenoma	1	12	11	3
Mucinous cystadenoma	1	12	3	2
Serous cyst adenofibroma	-	2	3	-
Seromucinous cystadenoma	-	3	2	1
Brenner tumor	-	-	1	-
Endometrial tumor	-	-	-	-
Mucinous tumor	-	1	2	-
High grade serous carcinoma	-	-	1	1
Papillary serous cystadenocarcinoma	-	1	-	-
Mature cystic teratoma (dermoid cyst)	6	13	4	-
Immature teratoma	-	-	-	-
Yolk sac tumor	-	-	-	-
fibrothecoma	-	-	-	-
Adult granulosa cell tumor	1	-	-	-
Metastatic adenocarcinoma	-	-	-	-
Total	9	44	27	7
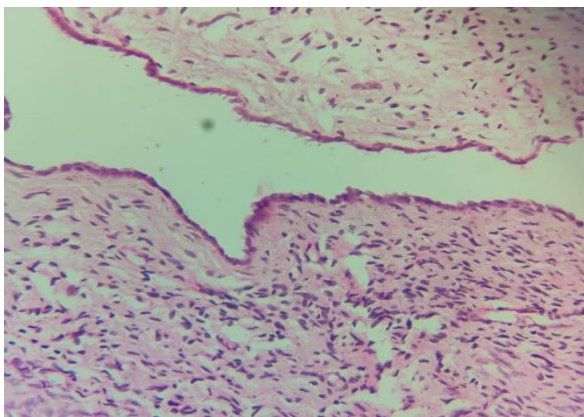
Figure 1: Serous cystadenoma (cystic spaces lined by simple cuboidal epithelium in fibrous stroma.)
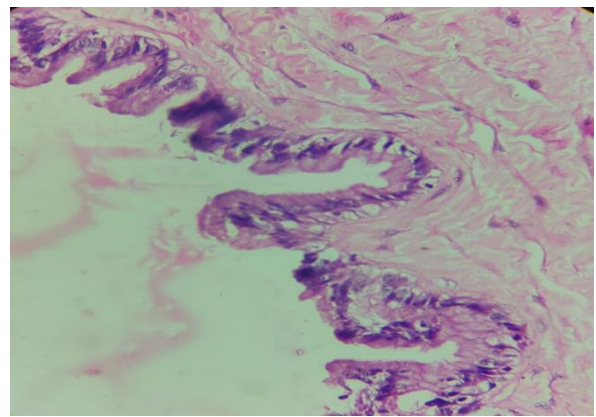

Figure 2: Mucinous cystadenoma (The lining epithelial cells exhibit basally located small nuclei and columnar cytoplasm containing mucin.)
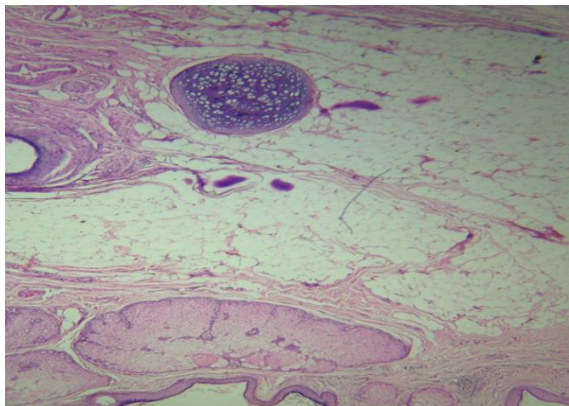
Figure 3: Mature teratoma (Squamous epithelium with underlying sebaceous glands, adipose tissue and cartilage.)

5.Discussion

Typically, ovarian masses consist of functional and pathological lesions. [6] Ovarian lesions including non neoplastic lesions and neoplastic lesions may occur at any age, including infancy and childhood. [3] Incidence rate, however increase with age, with the greatest number of new cases being diagnosed beyond 3th and 4th decade. [3] Ovarian cancer is the second leading cause of mortality among all gynecological cancers. [7] The structure of the ovary includes germ cells, follicular cells and the ovarian stroma. The function of the ovary is as complex as its structure. Any of these structures can give rise to a plethora of tumors. [8] The determination of these patterns is important for diagnosis, management and prognosis. However, histopathological study of tumour is still today a gold standard method, these observations and results proved to be valuable base line information regarding frequency and pattern of ovarian tumours in rural settings.

Laterality of ovarian neoplastic lesions in various studies in comparison with present study is illustrated in Table 9.

Our study revealed that 179 out of 185 ovarian specimens were unilateral (96.8%) and only 6 (3.2%) were bilateral. Our findings are in concordance with other study Couto et al-91.25% unilateral. [11]

The percentage distribution of patients in various age groups in comparison with other studies is illustrated in Table 10. The majority of our patients were in the age group 20-39 years (93 patients, 50.3% of patients) while those in the age group 40-59 years were the second largest group of patients (69 patients, 37.3% of patients). This is in concordance with the studies of Ramachandran et al (20-39 years-53.0%; 40-59 years-30% of patients) [13] and Pilli et al (20-39 years-58.0%; 40-59 years-30% of patients) [14] however, Kar et al reported 46.25% of patients in the age group 40-59 years. [12]

In present study, 98 lesions were non-neoplastic (53% of all specimens evaluated]; 80 lesions in our study (92% of all neopastic lesions) were benign neoplasms. In contrast, in the study by Gurung et al found 43.7% non-neoplastic lesions in their study, and 51.1% benign tumors. [16] Follicular cysts were the most common non-neoplastic lesion in our study (47%).

Benign neoplastic lesions constituted 80 out of 87 neoplastic lesions in present study (92%). This percentage is much higher than other authors (Pachori et al 72.3%; Couto et al 80.76%; Pilli et al 76%). [18, 11, 14] Serous cystadenomas were the most common benign neoplasm encountered in our study (30% of benign neoplastic lesions). This is in agreement with other studies. [10, 15, 16] Followed by mature cystic teratoma (26% of benign neoplstic lesions). This is concordance with Yogambal et al (serous cyst adenoma (21.4%) and mature cystic teratoma (19.9%))[17] Comparative incidence of neoplastic lesions of ovary according to site of origin was illustrated in table 7 shows that the most common site of origin is surface epithelium.

Table 7: Comparative incidence of neoplastic lesions of ovary according to site of origin

Author	Surface Epithelial Tumor	Germ cell tumor	Sex cord Stromal tumor	Metastatic tumor
Maru A et al. (2019) [19]	73.33%	23.33%	3.33%	-
Pilli et al. (2002) [14]	70.9%	21.2%	6.7%	0.7%
Bhuvanesh et al. (1978) [20]	78.57%	10.85%	7.14%	1.42%
Gupta et al (2007) [21]	65.6%	23.9%	8.3%	2%
Present study	72%	27%	1%	-

Comparative incidence of neoplastic lesions of ovary according to site of origin were illustrated in Table 8 shows that the most common site of origin is surface epithelium. This is in concordance with other studies. [19, 22, 23, 24]

Table 8: Comparative incidence of most common benign neoplastic lesions of ovary

Author	Serous cystadenoma	Mature teratoma	Mucinous cystadenoma
Maru A et al. (2019) [19]	28%	13%	6%
Mondal et al. (2011) [22]	29.9%	15.9%	11.1%
Amod et al (2017) [23]	12.58%	2.09%	1.39%
Yasmin et al. (2008) [24]	24%	18%	-
Present study	30%	26%	21%

Comparative incidence of most common benign neoplastic lesions of ovary was illustrated in Table 7. This comparison shows that majority of benign tumors are serous cystadenoma.

Table 9: Laterality of ovarian neoplastic lesions in various studies in comparison with present study

Author	Unilateral	Bilateral
Prabhakar et al 1989 [9]	90.9%	9.1%
Misra et al 1990 [10]	95.5%	4.5%
Couto F et al 1993 [11]	91.2%	8.7%
Kar et al 2005 [12]	73.13%	26.8%
Present study	96.8%	3.2%

Table 10: Percentage distribution of cases in various age groups in comparison with present study

Authors	0-19 years	20-39 years	40-59 years	>60 years
Ramachandran et al 1972 [13]	7.9%	53%	30%	9.1%
Pilli et al 2002 [14]	7%	58%	30%	5%
Kar et al 2005 [12]	7.4%	41.7%	46.2%	4.4%
Present study	8.1%	50.3%	37.3%	4.3%

6.Conclusion

Study present findings of pathologies diagnosed on histopathological evaluation of ovarian mass lesions received during a three-year period from January 2019 to December 2021. From the present study we conclude that non neoplastic lesions more than neoplastic lesions. In neoplastic lesions benign ovarian tumors are more common than the malignant tumors. The most common age group for occurrence of ovarian tumors is 20-39 years. Among non neoplastic lesions, follicular cyst is common while among benign tumors; serous cystadenoma is common followed by mature cystic teratoma. Malignant neoplasms of ovary are rare as compared to Benign neoplasms but require a specific attention during diagnosis on both clinical and pathological basis. Role of histopathological evaluation remains always important in diagnosis and management of such cases along with clinical and radiological evaluations. Histopathological study is useful to predict nature and course of ovarian lesions so that future worse outcome can be prevented with early intervention.

References

[1] Padubidri VG, Daftary SN. Howkins & Bourne. Pattern of ovarian lesions, Shaw's Textbook of Gynecology, 16th edition. Elsevier; 2014: 429-36.

[2] Modi D, Rathod GB, Delwadia KN, Goswami HM. Histopathological pattern of neoplastic ovarian lesions. IAIM.2016; 3 (1): 51-7.

[3] Young RH. The ovary. In: Sternberg S. Diagnostic Surgical Patholo.17th Ed. New York: Raven Press.1994: 2195.

[4] Tortolero L, Mitchell FM, Rhodes HE. Epidemiology and screening of ovarian cancer. Obstet Gyanecol Clin North Am.1994; 21: 63-75.

[5] Bhattarcharya MM, Shinde SD, Purandare VN. A clinicopathological analysis of 270 ovarian tumors. J Postgrad Med.1980; 26: 103-7.

[6] Forae GD, Aligbe JU. A histopathological overview of ovarian lesions in Benin City, Nigeria: How common is the functional cyst? Int J Med Public Health.2014; 4: 265-8.

[7] Modugno F. Ovarian cancer and polymorphisms in the androgen and progesterone receptor genes. Am J Epidemol.2004; 159 (4): 319-35. Available from: https://doi. org/10.1093/aje/kwh046.

[8] Barber HR. Embryology of the gonad with reference to special tumours of the ovary and testis. Journal of pediatric surgery.1988: 967-72.

[9] Prabhakar BR, Kalyani M. Ovarian tumors-prevalence in Punjab. Indian J Pathol Mirobiol.1989; 32 (4): 276-81.

[10] Misra RK, Sharma SP, Gupta U, Gaur R, Misra SD. Pattern of ovarian neoplasms in eastern UP. J Obstet Gynecol.1990; 41 (2): 242-6.

[11] Couto F, Nadkarni NS, Rebello MJ. Ovarian tumors in Goa. A clinicopathological study. J Obstet Gynecol of India.1993; 43 (3): 408-12.

[12] Kar T, Kar A, Mohapatra PC. Intra-operative cytology of ovarian tumors. J Obstet Gynecol India.2005; 55 (4): 345-9.

[13] Ramachandran G, Harilal KR, Chinnamma K, Thangavelu H. Ovarian neoplasms-A study of 903 cases. J Obstet Gynecol India.1972; 22: 309-15.

[14] Pilli GS, Sunitha KP, Dhaded AV, Yenni VV. Ovarian tumors-a study of 282 cases. J Indian Med Associ.2002; 100 (7): 420-4.

[15] Thakkar NN, Shah SN. Histopathological study of ovarian lesions. Int J Sci Research 2015; 4 (10): 1745-9.

[16] Gurung P, Hirachand S, Pradhanang S. Histopathological study of ovarian cystic lesions. J Inst Med.2013; 35 (3): 44-7.

[17] Yogambal M, Arunalatha P, Chandramouleeswari K, Palaniappan V. Ovarian tumors-Incidence and distribution in a tertiary referral center in South India. IOSR J Dent Med Sci.2014; 13 (2): 1400-3.

[18] Pachori G, Meena US, Sunaria RK, Pachori P, Jethani N, Bayla T. Histopathological study of ovarian tumors in Ajmer region. Int J Med Sci Public Health.2016; 5: 1400-3.

[19] Maru AM, Menapara CB. Histopathological study of Non-neoplastic & Neoplastic ovarian lesions in a tertiary care hospital in Gujarat, India. Trop J Path Micro 2019; 5 (2): 63-68. doi: 10.17511/jopm.2019. i02.03

[20] Bhuvanesh U, Logambal A. Study of ovarian tumours. J Obstet Gynaecol India.1978; 28: 271-77.

[21] Gupta N, Bisht D, Agarwal AK, Sharma VK. Retrospective an prospective study of ovarian tumours and tumour-like lesions. Indian J Pathol Microbiol 2007; 50 (3): 525-7. PMid: 17883123.

[22] Mondal SK et al. Histologic pattern, bilaterality and clinical evaluation of 957 ovarian neoplasms: a 10 years study in a tertiary hospital of Eastern India. J Can Res Ther 2011; 7: 433-7.

[23] Amod Sawant, Suresh Mahajan. histopathological study of ovarian lesions at a tertiary health care institute, MVP Journal of Medical Sciences 2017; 4 (1): 26-29.

[24] Yasmin S, Yasmin A, Asif M. Clinicohistological pattern of ovarian tumours in Peshawar region. J Ayub Med Coll Abbottabad 2008; 20 (4): 11-3