Section: Pathology

Original Research Article

HISTOPATHOLOGICAL STUDY OF LESIONS OF OVARY IN A TERTIARY HEALTH CARE INSTITUTE – A THREE-YEAR PROSPECTIVE STUDY

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Abstract

Background: Ovarian lesions form a complex group of lesions with a broad spectrum of clinical and histopathological features that may develop from neonatal period to post-menopause. They are amongst the most frequent cause of hospitalization and surgery in gynecological practice. Distinguishing benign lesion from a malignant ovarian tumor is a challenge based on clinical, radiological, or gross characteristics alone, thus histopathological examination is necessary for further management. This study was done to analyze the frequency of non-neoplastic and neoplastic lesions of the ovary with respect to age, histopathology and further assess the prognosis in malignancy. **Materials and Methods:** This is a prospective study of 150 ovarian lesions at tertiary care hospital over a period of 3yrs from July 2019 to June 2022. **Result:** The total number of ovarian lesions during the study period were 150 cases, amongst them 112 were non-neoplastic and remaining 38 were neoplastic. The most common non-neoplastic lesion seen was cystic follicles/solitary follicular cysts (80 cases; 71.4%). Among the 38 neoplastic ovarian lesions, 34 cases were benign, 2 cases were borderline, and 2 cases were malignant. In benign ovarian neoplasm, most seen lesions were serous cystadenoma followed by benign cystic teratoma. A rare case of yolk sac tumour was reported in 24-year-old patient. The most common age group overall in ovarian tumors 30–39 years. Benign tumors were most common in the 30–39 years age group, while malignant mucinous cystadenocarcinoma was seen in 60–69 years age group. Bilaterality was seen in 25 cases (16.6%) cases of neoplastic ovarian tumors. **Conclusion:** The study emphasizes on histopathological evaluation of ovarian lesions as various benign and malignant conditions that occur with increasing frequency and carries diagnostic and therapeutic significance. Specific diagnoses are made on routine gross and histological examination or in certain difficult cases require immunohistochemistry.

INTRODUCTION

The ovaries constitute the internal reproductive organs which lie on either side of uterus close to lateral pelvic wall. Normal ovary varies in size with measuring upto 5x3x3cm. Variation results from endogenous hormonal production which varies with age and each menstrual cycle.[1]

Tumors of ovary are common and about 2/3rd of these are encountered during reproductive years. 80 - 85% of them are benign occurring in women between 20 and 44 years of age.[2,3] A few risk factors include nulliparity, heredity and few genetic syndromes like Lynch syndrome and Peutz-Jeghers syndrome. These lesions are generally categorized into non-neoplastic consisting predominantly of functional cyst (Corpus luteal cyst, Follicular cyst) endometriotic cyst, tubo-ovarian abscess, cyst of polycystic ovarian syndrome, inflammatory lesions, surface epithelial inclusion cyst etc. Non-neoplastic lesion such as Functional cyst are frequently seen in young female in their 2nd decades due to failure of ovulation. Neoplastic lesions that are further sub-categorized into a variety of lesions depending on multiple factors into Benign, Borderline and Malignant comprises of four main components namely Surface epithelial, Germ cell, Sex cord and Ovarian stroma, specialized and nonspecific. The germ cell neoplasms predominate in prepubertal children and young adults, whereas lesions of epithelial origin predominate in elderly and

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postmenopausal women. Among all the ovarian neoplasm about 80% are benign having cystic, solid or mixed characteristics and remaining 20% are malignant in nature leading to fatal prognosis. Distinguishing non-neoplastic lesion from a neoplastic lesion is a challenge clinically and is important in guiding therapy. Ovarian cancer accounts for 2.5% of all malignancies among females but 5% of female cancer deaths because of low survival rates, largely driven by late-stage diagnosis.[4]

Prognosis of ovarian tumours in women under 40yr of age have greater a chance of recovery than older patient.[5]

Ovarian cancer is the 7th most common cancer and 8th most common cause of death from cancer in women in the world. National Cancer Registry Programme (NCRP) at Bengaluru, India states that 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.[6]

Owing to the broad spectrum of presentation of ovarian lesion and importance of histological diagnosis for proper management, this study was conducted to exactly categorize the different type of ovarian lesions, their age relation, brief clinical presentation and to assess the prognosis considering the microscopic features.[6]

MATERIALS AND METHODS

This prospective study was conducted in the department of Pathology at our institute over a period of 3 years from July 2019 to June 2022. Clinical data was retrieved from histopathology requisition form/hospital records of patients presenting with ovarian lesions. All specimens (biopsies/surgical specimens) that were received in our histopathology section were fixed in 10% formalin, embedded in paraffin, sectioned at 3-5µ and stained with Hematoxylin and Eosin. Special stains like Periodic acid Schiff (PAS) was done as and when required. Descriptive statistical measures were utilized to present the data. A total of 150 cases of ovarian lesions fulfilling these criteria were finally included in this study. Histologically ovarian lesions were classified into non-neoplastic masses and neoplastic masses. Non-neoplastic masses were further subdivided into different types of cysts, other lesions, and neoplastic masses were divided as benign, borderline and malignant lesions.

Inclusion Criteria

Ovarian biopsies and all ovarian specimens received either as a solitary specimen or part of total abdominal hysterectomies or cystectomies received in department of Pathology were included in the study.

Exclusion Criteria

Normal ovaries and specimen of post-chemotherapy ovaries were excluded from the study.

RESULTS

A total of 150 cases presented as ovarian lesions was included in this study. Minimum age of the patients presenting with the ovarian lesion in our study was 14 years while maximum age was 65 years. Mean age of presentation was 34 years. Ovarian lesions were most common in the age group of 21-40 years, comprising of 83 (55.4%) cases [Table 1]. Bilaterality was seen in 25 cases (16.6%) of ovarian lesions. [Table 2].

Amongst 150 cases, 112 cases were nonneoplastic and remaining 38 were neoplastic. The most common non-neoplastic lesion seen was cystic follicles/solitary follicular cysts (80 cases; 71.4%), followed by corpus luteal cysts (28 cases; 25%) and endometriosis (4 cases; 3.57%) [Table 3].

Among the 38 neoplastic ovarian lesions, 34 cases were benign (89.47%), 2 cases were borderline (5.2%) and 2 cases were malignant (5.2%). In benign ovarian neoplasms, most seen lesions were serous cystadenoma (18 cases; 47.36%) followed by benign cystic teratoma (6 cases; 15.17%), mucinous cystadenoma (5 cases; 13.15%), serous cystadenofibroma (3 cases; 7.89%) and seromucinous cystadenoma (2cases; 5.26%). In borderline ovarian tumors, mucinous borderline tumor (2 cases; 5.26%) were seen. Amongst 2 malignant cases (5.26%), yolk sac tumor was reported in the 25year old patient, and one case of Mucinous cystadenocarcinoma was reported in 62-year-old female. [Table 4]

Most of the ovarian lesion presented with pain abdomen (52/150) followed by mass per abdomen (38/150) either alone or in combination with pain abdomen. Other presenting symptoms were abnormal uterine bleeding (27/150) in the form of menorrhagia or metrorrhagia, primary or secondary infertility, amenorrhea or dysmenorrhea in occasional cases and 28 cases were asymptomatic. [Table 5]

Table 1: Age-wise distribution of cases presenting with ovarian lesions.

Sl. No.	Age in years	No. of Cases	Percentage (%)
1.	<20 YEARS	13	8.6
2.	21 – 40	83	55.4
3.	41 – 60	46	30.6
4.	51 – 60	08	5.4
Total		150	100

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Table 2: Laterality of ovarian lesions

Laterality	Side	Number & %Age	Total No. & %Age
Unilateral	Right	88(58.6)	125(83.3)
	Left	47(31.3)	
Bilateral		25(16.6)	25(16.6)
Total		150(100)	

Table 3: Distribution of non-neoplastic lesions of ovary

Type of lesion	Diagnosis	Number	Percentage
Non-neoplastic	Cystic follicles	64	57.14
	Follicular cyst	16	14.28
	Hemorrhagic luteal cyst/ luteal cyst	28	25
	Endometriosis	04	3.57
Total		112	100

Table 4: Distribution of neoplastic lesions of ovary

Type of lesion	Diagnosis	Number	Percentage
Benign	Serous cystadenoma	18	47.36
	Mucinous cystadenoma	05	13.15
	Benigncystic teratoma	06	15.17
	Serous cystadenofibroma	03	7.89
	Seromucinous cystadenoma	02	5.26
Borderline	Borderline mucinous tumor	02	5.26
Malignant	Mucinous cystadenocarcinoma	01	2.63
	Yolk sac tumor	01	2.63
Total		38	100

Table 5: Clinical indications for ovarian lesions

Clinical presentation	Number of cases
Pain abdomen	52
Mass per abdomen	38
Abnormal uterine bleeding (aub)	27
Infertility	13
Amenorrhoea	02
Asymptomatic	28
Total	150

Figure 1: Serous Cystadenoma - Shows large single cyst.

Figure 3: Serous Cystadenofibroma – Shows uniloculated cyst with areas of fibrosis in the cyst wall.

Figure 2: Mucinous Cystadenoma - Shows multiloculated cysts.

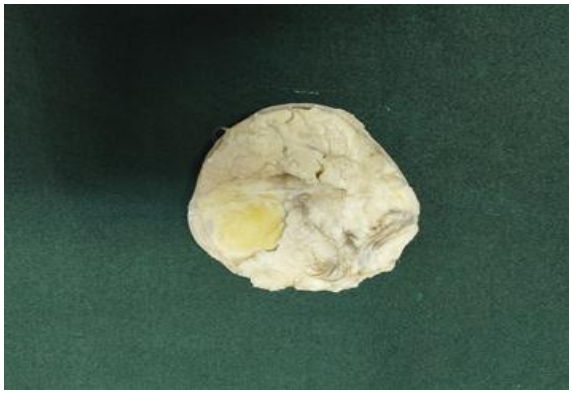

Figure 4: Mature Cystic Teratoma- Shows hair follicles and adipose tissue with solid and cystic areas

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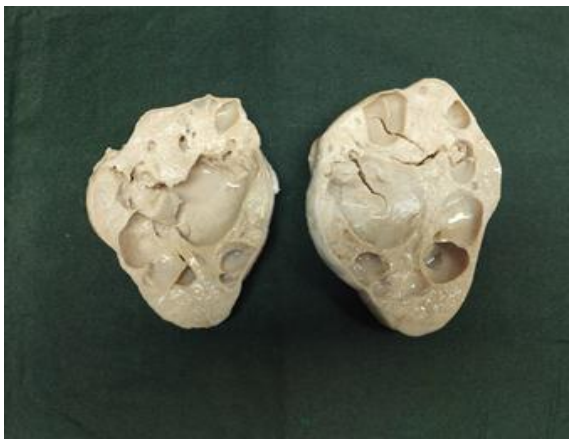

Figure 5: Yolk Sac Tumor – Shows solid and cystic areas

Figure 6: Mucinous cystadenocarcinoma - Solid and multiple cystic areas

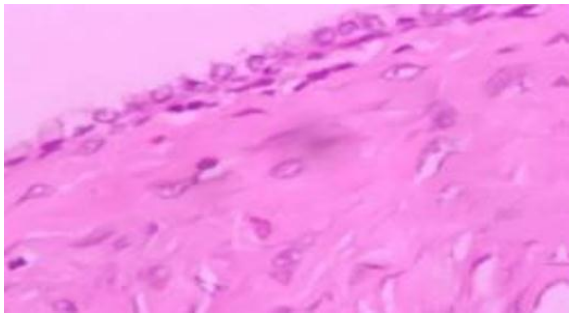

Figure 7: Serous Cystadenoma: Cyst lined by single layer of flattened to cuboidal epithelium

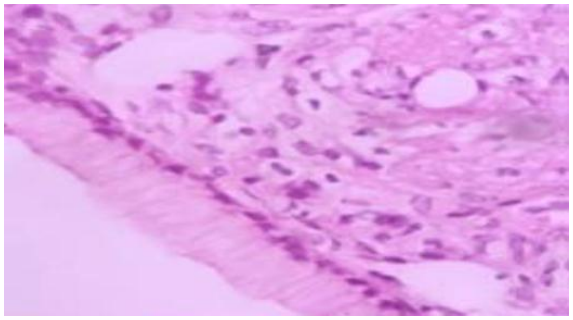

Figure 8: Mucinous Cystadenoma: Cyst lined by single layer of columnar mucinous epithelium showing mucin filled cells with basally located nuclei. (H&E x 400).

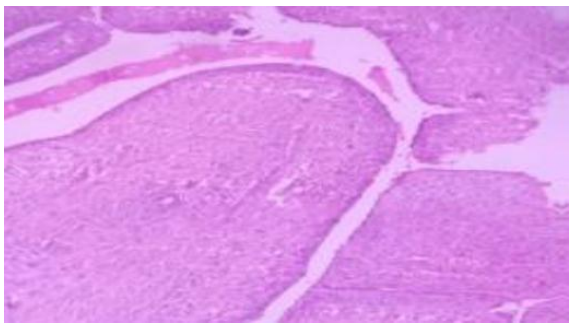

Figure 9: Serous Cystadenofibroma: Broad papillae lined by single layer of epithelium. Highly cellular and fibrous stroma is seen beneath the epithelium. (H&E x 100).

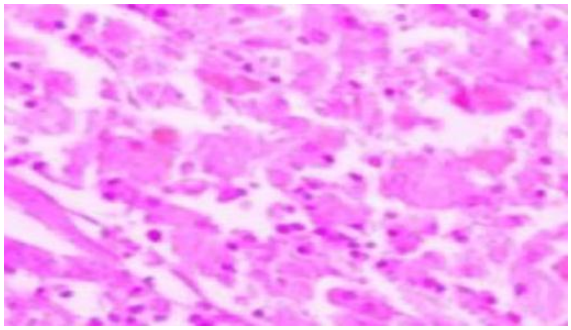

Figure 10: Endometriosis: Numerous hemosiderin laden macrophages surrounding endometrial glands. (H&E x 400)

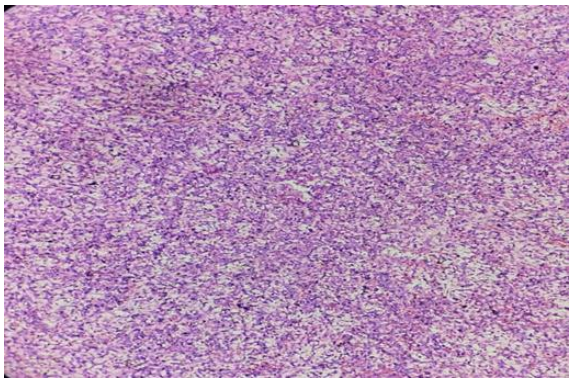

Figure 11: Yolk Sac Tumor: solid pattern along with loose meshwork of anastomosing channels lined by primitive tumor cells with varying amounts of clear to eosinophilic cytoplasm. (H&Ex100)

DISCUSSION

Ovarian lesions form a complex group of lesions with a broad spectrum of clinical and histopathological features. A total number of 150 cases were included in our study. Age of the patients ranged from 14 years to 65 years. Mean age group recorded was 34 years. In a study by Farooq et al. mean age of females for all ovarian masses was 40.61 ± 13.74 years.[7] Overall most common age group affected were young reproductive female (21-40 years). Both non-neoplastic and neoplastic benign lesions were common to this age group. This is similar to other reports where most of the benign ovarian lesions occur in women of reproductive age groups.[8,9]

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Neoplastic malignant lesions were most common in 41–50-year age group but it has been seen in all age groups including reproductive, perimenopausal, and postmenopausal women. A study by Murthy NS et al. involving data across various cities in India revealed that the incidence of ovarian cancer increases from 35 years of age reaching its peak between 55-64 years.[10]

Our study revealed that 125 out of 150 ovarian specimens were unilateral (83.3%) and only 25 (16.7%) were bilateral, similar to study by Gurung et al. [11] Our findings vary slightly by the study done by Kanithkar et al. in which 78.18% tumours were unilateral and 21.82% tumours were bilateral.[5]

In Benign and malignant ovarian neoplasm, abdominal pain was the most common complaint, followed by lump abdomen. Kanthikar SN et al. and Pilli et al. also observed similar clinical presentation in non-neoplastic lesions.[5,12]

Grossly, it was found in our study that non-neoplastic as well as benign tumours were mostly cystic as compared to malignant, which were solid in consistency followed by partly cystic and partly solid which is in accordance with other studies.[12]

In present study, out of 150 cases, 112 lesions were non-neoplastic (74.6%) while 38 lesions (25.4%) were neoplastic lesion. This is similar to study Ahmed N et al who reported 106 cases were non-neoplastic while 84 cases were neoplastic out of 190 cases.[4]

Among non-neoplastic lesions, Functional cysts were the most common lesions. Corpus luteal cysts including hemorrhagic corpus luteum cysts was the most commonly encountered ovarian lesions. This is followed by Simple cysts and Endometriotic cysts. This finding is similar to studies done by Choi and Kim where corpus luteum cyst was the most commonly encountered ovarian lesions.[13] Yasmin et al, Maliheh et al, and Thakar et al. from India in their studies reported follicular cysts as the most common non-neoplastic lesion.[14-16] The reason for this variation cannot be fully ascertain, but may be attributable to environmental, hormonal, and genetic influences. Other commonly diagnosed cysts in our study include simple/serous cysts. Studies have also supported the fact that these cysts are also commonly reported by other researchers globally.[17,18] In current study among 38 neoplastic lesions, 34(89.47%) cases were benign, 2(5.7%) cases were of borderline nature while 2(5.7%) cases were malignant. This is in synchrony with the study of Sheikh et al. N Gupta et al.[19,20]

Using the WHO criteria to classify ovarian tumors, it is conventionally known that surface epithelial was the most common lesion seen globally. In surface epithelial tumour, Serous Cystadenoma was the most common benign neoplasm followed by Mucinous Cystadenoma. This finding coincided with previous studies by Gupta et al.[20] Similar results have been reported by Yasmin et al.[14] Teratoma was the most common Germ cell tumour found in our study contributing 6 cases (15.17%) of all ovarian tumours which is comparable to the results observed in studies carried out by Yasmin et al. and Zaman et al. Which were showing 18% and 19.35% respectively.[14, 21]

Borderline ovarian tumours are of low malignant potential having favorable prognosis and relatively early age at onset.[22] They comprise 4%–14% of all epithelial ovarian neoplasms.[23] In our study, we diagnosed 2 cases (3.6%) of borderline mucinous ovarian tumour.

In the present study, mucinous cystadenocarcinoma was reported which correlated with study done by Kanthikar N et al,[5] and one rare case of yolk sac tumour was noted which correlated with the study done by Rouge M et al.[24]

CONCLUSION

Ovary, despite being a small pair of organ in female genital system has complex architecture with different cell types. Hence it encompasses broad group of lesion from non-neoplastic to neoplastic benign, borderline and malignant lesion. In our study we have compared these lesions with multiple parameters like age, clinical presentation and different histological subtypes. All these clinical and histomorphological parameters and advanced newer diagnostic modalities can help to arrive at early definitive diagnosis and to plan the line of treatment and also have prognostic significance. Both non-neoplastic as well as neoplastic lesions of ovary often present with similar clinical, radiological and surgical features. So histopathological study is essential to diagnose ovarian tumours and predict their prognosis. In cases of benign functional cysts spontaneous resolution may take place, so symptomatic treatment and observation may help to minimize surgery in these patients. Since most of the malignant cases are detected at a later stage, their early diagnosis can help in patient long survival and prognosis.

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