

# Histopathological Spectrum of Ovarian Lesions: A Retrospective Analysis

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## Abstract

**Aim:** This study was undertaken to study the various histopathological patterns of ovarian lesions, their classification and relative distribution of these lesions.

**Methods:** The study was undertaken as a retrospective systematic study using existing patient data retrieved from the records of the Department of Pathology, Darbhanga Medical College and Hospital, Laheriasarai, Darbhanga, Bihar, India during the period of around two years from 2019 to 2020. 200 ovarian mass specimens were received for evaluation, either as solitary specimens, or as part of total abdominal hysterectomy (TAH) specimens.

**Results:** Majority of the Patients were in the age group of 10-39 years. A total of 170(85%) cases were unilateral while 20(15%) cases were bilateral. 39 cases were asymptomatic. Associated findings in specimens of Hysterectomy with salpingo-oophorectomy were also found. Most common was leiomyoma either alone or in combination with adenomyosis. Other associated findings were chronic cervicitis, carcinoma endometrium, carcinoma cervix; hydrosalpinx etc. Other non-neoplastic lesion were Cystic follicle (14 cases), Follicular cyst and Parovarian cyst (6 cases each), hemorrhagic cyst, ectopic gestation, Torsion ovary, Inclusion cyst and oophoritis.

**Conclusion:** Ovarian lesion comprises of wide spectrum of lesions and their presenting clinical, radiological and gross features are very similar. Hence Histopathology forms the mainstay of definitive diagnosis and categorization of these lesions.

**Keywords:** Neoplastic Lesion, Non-neoplastic lesion, Ovary, Ovarian cyst, serous cystadenoma

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## Introduction

In India, the health of women has been emphasized for many decades through various national health programs and policies. With a wide range of clinical manifestations and poor access to health care facilities, it is important to evaluate the pattern of clinical presentation, corroborating with histological diagnosis

of ovarian lesions. [1] Ovaries are complex organs with unique physiology. The constant cyclical changes from puberty to menopause have made the ovary a site with a variety of cell types, each of which can give rise to tumors. [2,3] Though 80% of ovarian neoplasms are benign, the rest

are malignant which causes significant mortality. [4]

Malignant ovarian tumors represent the sixth most common cancer among females and the second most common cancer of the female reproductive system. [5] India has the 2nd highest burden of ovarian cancers with poor survival outcomes, demonstrating low survival after 5 years (29%). [6] Approximately 60-70% of the malignancies present as either stage III or stage IV disease. [7,8] Ovarian cancer is the 7th most common cancer and 8th most common cause of death from cancer in women in the world. [9] 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. [10]

Tumor stage and laterality may also give a clue to their nature. While sex cord-stromal tumors are predominantly unilateral, bilaterality is more commonly seen in tumors metastasized to the ovary and in serous carcinoma. [11] Distinguishing non-neoplastic lesion from a neoplastic lesion is a challenge clinically and is important in guiding therapy. Even non neoplastic cystic lesions are also frequently responsible for a pelvic mass and associated with abnormal hormonal manifestations often mimicking a neoplasm thus causing diagnostic confusion. They are diagnosed on histopathology. [12] 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. [13]

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.

This study was undertaken to study the various histopathological patterns of ovarian lesions, their classification and relative distribution of these lesions.

### Materials and Methods

The study was undertaken as a retrospective systematic study using existing patient data retrieved from the records of the Department of Pathology, Darbhanga Medical College and Hospital, Laheriasarai, Darbhanga, Bihar, India during the period of around two years from 2019 to 2020 . 200 ovarian mass specimens were received for evaluation, either as solitary specimens, or as part of total abdominal hysterectomy (TAH) specimens.

### Methodology

All samples were received from the operation theater in buffered formol saline as per protocols given in the Standard Operating Procedure (SOP) for Histopathology of the Hospital. Samples were grossed on the same day that they were received, after ensuring adequate tissue fixation.

Tissue slices were taken and processed as per SOP. Microsections of 5 microns thickness were taken onto glass slides and stained by standard Hematoxylin and Eosin stains as per protocols. After mounting and labeling, all slides were viewed by at least two Pathologists before final reporting. All lesions were classified using WHO guidelines.

### Statistical analysis

For the purpose of this study, all records pertaining to the study period were retrieved. Details of the histopathological diagnoses of the ovarian masses evaluated, as well as the age distribution of the patients, were analyzed. All patient data were kept confidential. Data was analyzed using an MS Excel worksheet and calculations of incidence made from the same.

## Results

**Table 1: Age wise distribution of patients operated for ovarian masses**

Age in years	Number of patients (total=200)	Patients (%)
<19	12	6
20-39	108	54
40-59 84 36.6%	70	35
>60	10	5

Majority of the Patients were in the age group of 10-39 years.

**Table 2: Laterality of ovarian Lesion**

Laterality	Side	Number & %age	Total No. & %age
Unilateral	Right	108(54)	170(85)
	Left	62(31)	
Bilateral		30(15)	30(15)

A total of 170(85%) cases were unilateral while 20(15%) cases were bilateral.

**Table 3: Clinical presentation of all the cases of Ovarian Lesions**

Clinical presentation	Number of cases
Pain Abdomen	75
Swelling abdomen	32
Pain abdomen and swelling abdomen	15
Abnormal uterine bleeding (AUB)	28
Pain abdomen and AUB	3
Infertility	15
Amenorrhoea	2
Asymptomatic	30
Total	200

39 cases were asymptomatic. Associated findings in specimens of Hysterectomy with salpingo-oophorectomy were also found. Most common was leiomyoma either alone or in combination with adenomyosis. Other associated findings were chronic cervicitis, carcinoma endometrium, carcinoma cervix; hydrosalpinx etc.

**Table 4: Non-neoplastic lesions of ovary with laterality and number**

Types of cyst	Right	Left	Bilateral	Total
Cystic follicle(CF)	3	5	6	14
Follicular cyst(FC)	1	3	2	6
Corpus Luteal Cyst(CLC)	12	12	2	26
Hemorrhagic cyst(HC)	3	1	0	4
Endometriotic cyst(EMC)	11	6	4	21
Ectopic Gestation(EG)	1	1	0	2
Inclusion Cyst(IC)	2	0	0	2
Parovarian Cyst(PC)	4	2	0	6
Simple Cyst(SC)	12	9	0	21
Ovarian Abscess(OA)	0	1	0	1
Chronic nonspecific	0	1	0	1

oophoritis(CO)				
Xanthogranulomatous oophoritis(XO)	1	0	0	1
Torsion ovary	0	1	0	1

Other non-neoplastic lesion were Cystic follicle (14 cases), Follicular cyst and Parovarian cyst (6 cases each), hemorrhagic cyst, ectopic gestation, Torsion ovary, Inclusion cyst and oophoritis.

**Table 5: Neoplastic lesions with laterality and number**

Category of Neoplastic lesion	Type of Neoplastic Lesion	Right	Left	Bilateral	Total
<b>Benign</b>	Serous cystadenoma	31	9	0	40
	Dermoid cyst	11	5	2	18
	Mucinous Cystadenoma	7	4	0	11
	Serous Cystadenofibroma	1	0	0	1
	Seromucinous Cystadenoma	1	0	0	1
	Brenner Tumour	0	1	0	1
	Thecoma	1	0	0	1
	Benign Lipomatous lesion	1	0	0	1
<b>Borderline tumour</b>	Borderline Serous cystadenoma	2	0	0	2
	Atypical proliferative endometrioid tumour	0	1	0	1
<b>Malignant</b>	Serous carcinoma	2	0	1	3
	Endometrioid carcinoma	1	0	0	1
	Metastatic Carcinoma	0	0	3	3

Among the Benign lesion, Serous cystadenoma was the most commonly encountered lesion with 40 cases, followed by Dermoid cyst, and Mucinous cystadenoma, one case each of Serous Cystadenofibroma, Seromucinous cystadenoma, Brenner's tumour and Thecoma is also seen. Among Borderline lesions, two cases of Borderline Serous cystadenoma and one case of Atypical

proliferative endometrioid tumour were recorded. Among the malignancies, Serous carcinoma was the most common comprising of three cases, while three cases of Metastatic carcinoma from different sites to bilateral ovary recorded. One case of Endometrioid carcinoma was also seen.

#### Discussion

Ovarian lesions are unusual because of their diverse morphology and association with relatively mild symptoms. Neoplastic disorders can arise from (1) mullerian epithelium, (2) germ cells or (3) sex cord stromal cells. Tumors of the ovary are a common neoplasm in women. The most common lesions encountered in the ovary are functional or benign cysts and tumors. Typically, ovarian masses consist of functional and pathological lesions. [14] Given the location of these paired organs and the mildness of symptoms associated with lesions arising in them, these lesions usually attain a fairly large size before they are detected and removed. [15,16] Ovarian lesions are unusual because of their diverse morphology and association with relatively mild symptoms. Neoplastic disorders can arise from (1) mullerian epithelium, (2) germ cells or (3) sex cord stromal cells. [17] In this study, it was identified that irrespective of the laterality, normal histology of ovaries including the presence of cortical inclusion cyst, corpus luteum, and corpus haemorrhagicum was more frequently encountered than other non-neoplastic and neoplastic lesions in surgically resected specimens.

Overall most common age group affected were young reproductive female (21-30 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. [14,18] Our study revealed that 170 out of 200 ovarian specimens were unilateral (85%) and only 20 (10.5%) were bilateral, similar to study by Gurung et al. (88.15% unilateral and 11.85% bilateral) [19] and Thakkar and Shah (88.4% unilateral). [20] 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. [21]

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. [22] In present study, out of 200 cases, 106 lesions were non-neoplastic (53%) while 94 lesions (47%) were neoplastic lesion. This is similar to study by Martinez-Onsurbe P et al. who reported 55 cases (41.67%) of non-neoplastic lesions, out of total 132 ovarian lesions and Kreuzer GF et al. reported 82 (40.39%) non-neoplastic lesions, out of 203 ovarian lesions. [23,24] Gurung et al. found 43.7% non-neoplastic lesions and 56.3% neoplastic lesion in their study. [19]

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. [24] In current study among 94 neoplastic lesions, 80 cases were benign, 6 cases were of borderline nature while 8 cases were malignant. This is in synchrony with the study of Sheikh et al. N Gupta et al. [25,26] while contradictory to study by Ahmad Z et al. where malignant lesion was comparatively high(40.6%). [27] 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. [26]

Borderline ovarian tumours are of low malignant potential having favorable prognosis and relatively early age at onset. [28] They comprise 4%–14% of all epithelial ovarian neoplasms. [29] In our study, we diagnosed 3 cases (3.6%) of borderline ovarian tumour including 2cases of Borderline serous papillary neoplasm and one case of Atypical proliferative endometrioid tumour.

Metastases to the ovaries are relatively frequent with the most common being from the endometrium, breast, colon, stomach, and cervix. [30] Metastatic tumour (3 cases) constituted 3.61% of all the neoplastic ovarian lesion in our study and all of them were bilateral. Zaman et al. in his study reported single case of Metastatic tumour from breast. [31] Among sex-cord stromal tumour, a single case of Thecoma was diagnosed in our study. [32]

### 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 location of lump, associated lesions, 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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