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Spectrum of Ovarian Pathologies: A Histopathological Study of Received Oophorectomy Specimens

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Introduction

Ovarian lesions present a complex diagnostic challenge in clinical practice, demanding a thorough understanding of their histological characteristics for effective management. It is particularly crucial to differentiate between neoplastic and non-neoplastic conditions, as many non-neoplastic pelvic masses can clinically mimic ovarian malignancies. This study aimed to comprehensively analyze the spectrum of ovarian lesions observed within a tertiary care center, categorizing them based on their histomorphological patterns—namely, non-neoplastic, benign, borderline, and malignant—and their specific histopathological types, including surface epithelial tumors, sex cord stromal tumors and germ cell tumors.

The ovaries are vital paired reproductive organs, strategically positioned bilaterally to the uterus. They lie in close proximity to the lateral pelvic wall, posterior to the broad ligament, and anterior to the rectum [1]. The most commonly encountered ovarian lesions are functional or benign cysts and various types of tumors. While oophoritis (inflammation of the ovary) is relatively uncommon, in rare instances, autoimmune pathologies can specifically affect the ovary.

Non-neoplastic and functional cysts constitute a significant group of ovarian lesions. This category includes follicle cysts, luteal cysts, polycystic ovaries, and stromal hyperthecosis. Cystic follicles are exceedingly prevalent within the ovary. Functional cysts can typically be distinguished from neoplastic cysts by several key features: they generally measure between 6 and 8 cm, are often asymptomatic, tend to regress spontaneously, and are characteristically unilocular with clear fluid content [2]. These cysts are frequently observed in young females, particularly during their second decade of life, often due to temporary ovulation failure. Clinically, ovarian cysts commonly present with symptoms such as pain or lower abdominal discomfort. In cases of rupture, ovarian cysts can lead to abdominal distention [3,4]. polycystic ovarian syndrome (PCOS), also known as Stein-Leventhal syndrome, is a widespread endocrine disorder affecting 6% to 10% of women of reproductive age globally. PCOS is typically associated with a range of metabolic disturbances, including obesity, type 2 diabetes mellitus, and an increased risk of premature atherosclerosis.

Within the ovary, neoplastic lesions are broadly classified according to their cellular origin, which stems from three primary cell types: Müllerian epithelium, germ cells, and sex cord stromal cells [5]. Ovarian tumors encompass a vast array of types, exhibiting a varied age distribution and malignant potential. Approximately 80% of all ovarian tumors are benign, primarily affecting individuals between 20 and 45 years of age. Borderline tumors generally manifest in slightly older age groups, while malignant tumors are more frequently diagnosed in women aged 45 to 65 years. Ovarian tumors have earned the somber moniker of "silent killers" due to the significant challenges in early detection; they often remain asymptomatic until they have advanced considerably in size or stage [6]. Compounding this difficulty, the anatomical inaccessibility of the ovaries precludes the implementation of easy and effective screening methods [7]. Globally, the incidence of ovarian cancer varies. In different regions of India, ovarian cancer accounts for up to 8.7% of all cancers. In the United States, ovarian cancer comprises approximately 3% of all cancers diagnosed in females [8,9]. Epithelial ovarian tumors, which originate from the surface epithelium of the ovary, are further categorized as benign, borderline, and malignant. The majority of malignant epithelial tumors present as high-grade serous carcinoma. This aggressive subtype is associated with a particularly poor prognosis, as it is typically detected only after the cancerous cells have disseminated beyond the confines of the ovary and fallopian tube.

Aims: To analyse the spectrum of ovarian lesions and to categorize them on the basis of histomorphological pattern. It also aims to improve understanding of morphological characteristics and differential diagnoses in ovarian pathology, leading to more precise diagnoses and treatment.

Materials and Methods

This is a retrospective observational study done between November 2023 to October 2025 in department of Pathology.

Inclusion Criteria: All the ovarian specimens received in the Pathology department in the form of resected ovarian masses/ cystectomy specimens, ovarian biopsy specimens, tubo-ovarian masses and hysterectomy with salpingo-oophorectomy specimens.

Exclusion Criteria: Normal ovaries and specimens other than ovaries were excluded from the study.

A total of 73 samples were received in our department. Specimens were fixed in 10% formalin. Relevant clinical details were obtained

from the medical records. Detailed gross finding were noted and representative sections were submitted. The tissue was processed in fully automated processing unit, blocks prepared, 3-5 microns tissue sections were cut by microtome and the sections were stained with Haematoxylin and Eosin stain. Slides were reported by at least two pathologists and histopathological diagnosis was finalized. The details of the patients and data were kept confidential. The data was analysed using MS Excel worksheet.

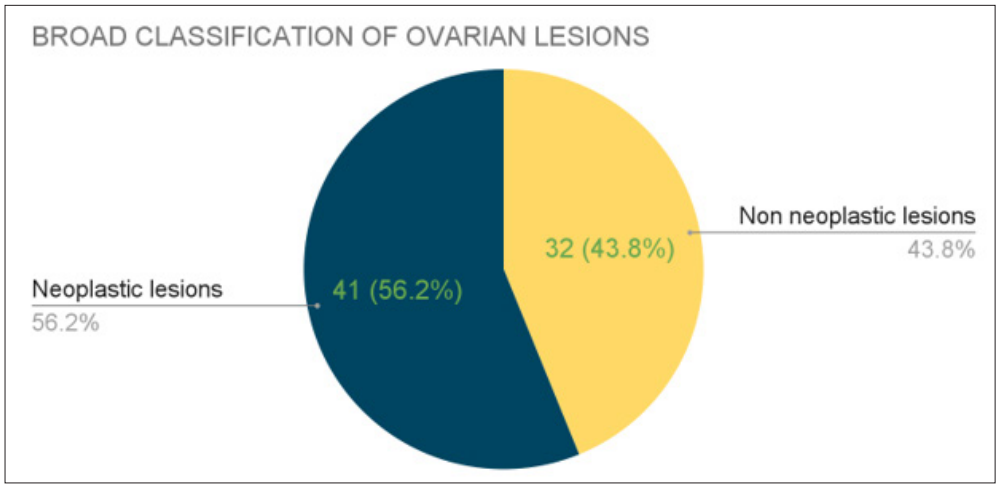
Results

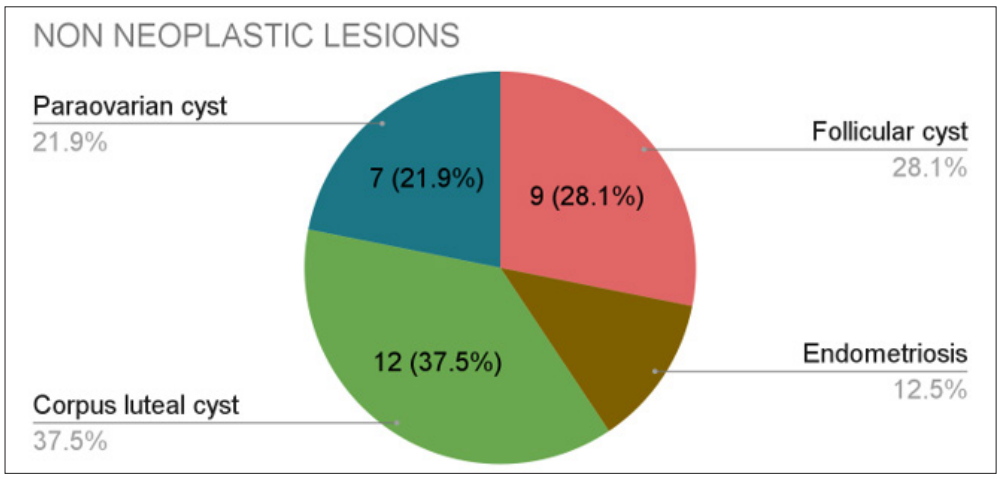
Table 1: Distribution of Ovarian Tumours Based on Histopathological Diagnosis

CATEGORY	HISTOPATHOLOGICAL DIAGNOSIS	NO. OF CASES
NON-NEOPLASTIC		
	Follicular cyst	9
	Endometriosis	4
	Corpus luteal cyst	12
	Paraovarian cyst	7
NEOPLASTIC		
BENIGN	Mucinous cystadenoma	10
	Serous cystadenoma	8
	Mature cystic teratoma	14
	Fibroma thecoma	2
	Seromucinous cystadenoma	1
	Benign Brenner tumor	2
MALIGNANT	Dysgerminoma	1
	Mature teratoma with area of malignant transformation	1
METASTATIC	Metastasis from Endometrial carcinoma with 10% serous component	1
	Metastasis from mucinous adenocarcinoma	1

Table-2: Distribution of Ovarian Tumours According to Histopathological Type

Nature of tumour	No. of cases
I. Surface Epithelial Tumours	
A. Serous Tumours	
- Serous Cystadenoma	8
B. Mucinous Tumours	
- Mucinous Cystadenoma	10
C. Seromucinous Tumours	
-Seromucinous Cystadenoma	01
D. Transitional Tumours	
- Benign Brenners Tumour	02
II. Sex Cord Stromal Tumours	
- Fibroma- Thecoma Group	02
III. Germ Cell Tumours	
- Dysgerminoma	01
- Mature Cystic Teratoma	14





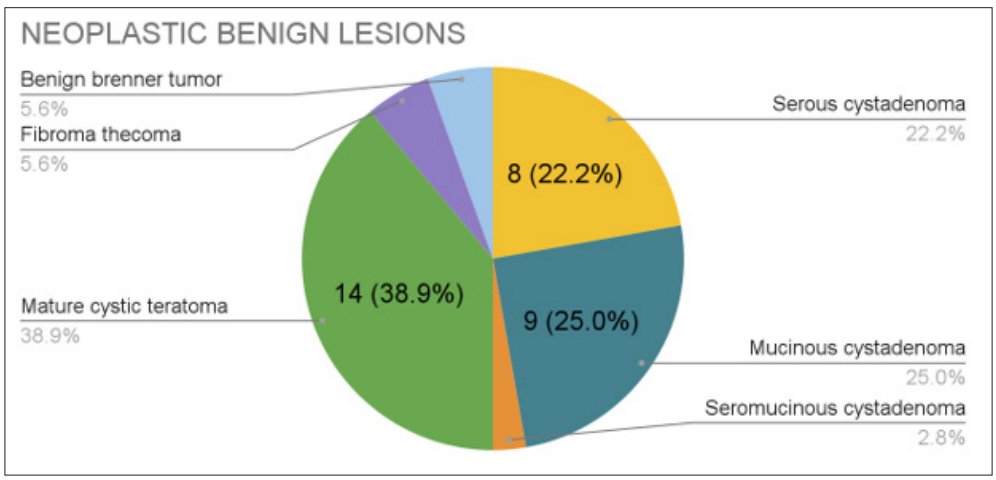


Table 3: Frequency of Different Classes of Neoplastic Lesions in Different Age Groups

Age group (in years)	Surface epithelial tumour	Germ cell tumour	Sex cord stromal tumour	Metastatic	Total
Up to 20	1	2	0	0	3
21-30	3	6	0	0	9
31-40	4	3	0	1	8
41-50	6	5	0	0	11
51-60	5	0	1	0	6
>60	2	0	1	1	4
TOTAL	21	16	2	2	41

Figure 1: Mucinous Cystadenoma of Ovary

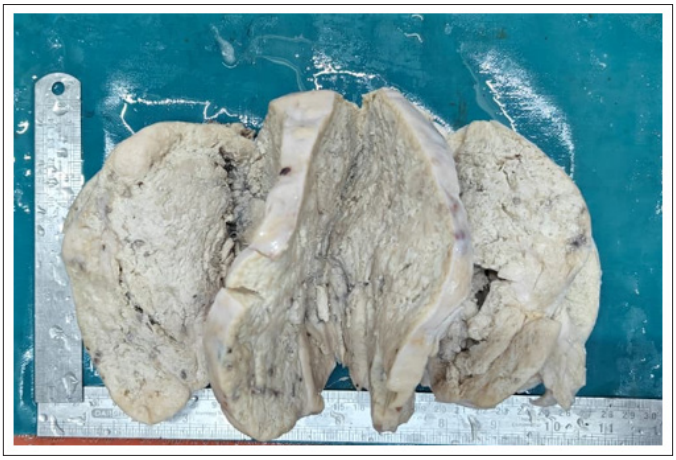


Figure 2: Dysgerminoma of Ovary

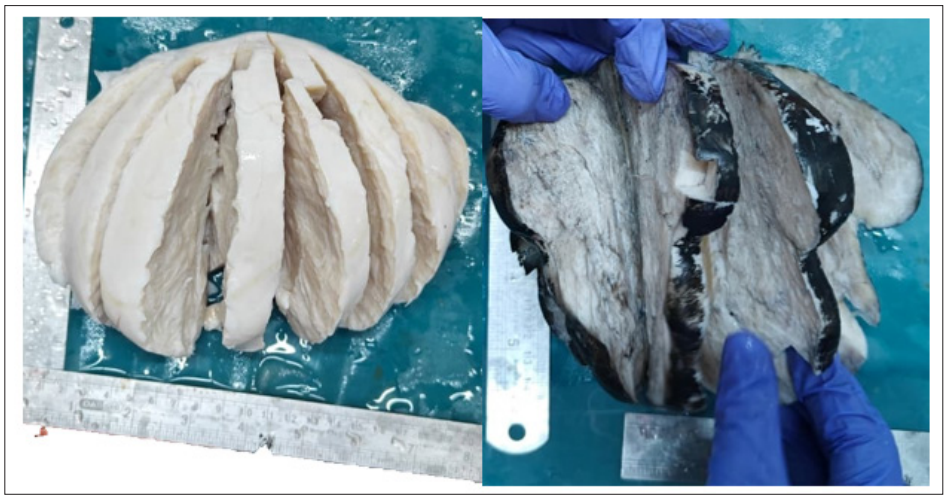


Figure 3: Fibroma Thecoma of Ovary

Figure 4: Fibroma Thecoma of Ovary

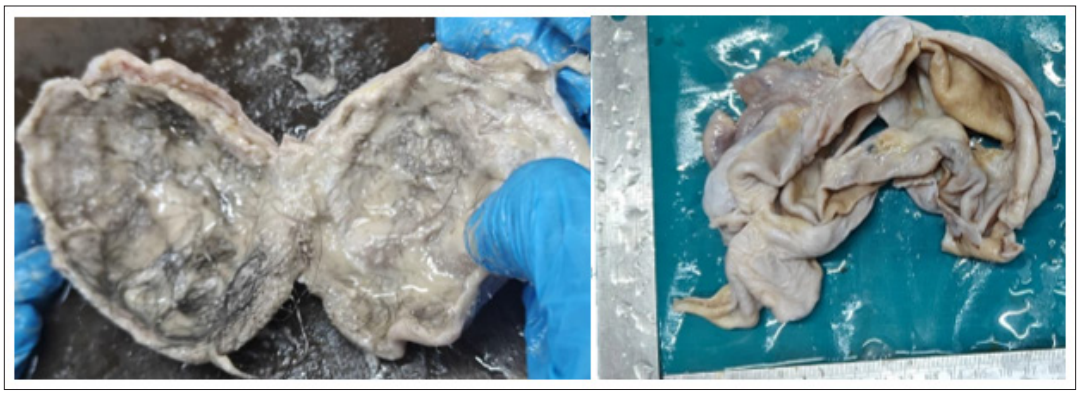


Figure 5: Mature Cystic Teratoma of Ovary

Figure 6: Mature Cystic Teratoma of Ovary

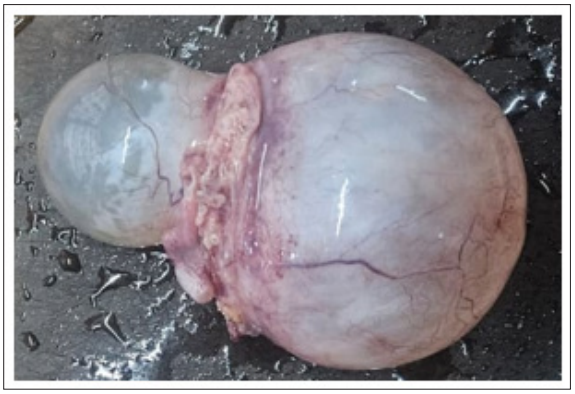


Figure 7: Serous Cystadenoma of Ovary

Discussion

In our study 73 cases of ovarian lesions were included. Most of the cases presented in 3rd and 5th decade of life. Study done by Purti Agrawal et al had peak incidence of ovarian tumor in 3rd and 5th decade of life [10].

Non neoplastic lesions were 32/73 cases (43.83%) and neoplastic lesions were 41/73 cases (56.16%). Similar findings were seen in studies done by Nehal Ahmad et al non neoplastic 55.8% and neoplastic 44.2%. The most common non neoplastic lesion was corpus luteal cyst (12/32 cases) followed by follicular cyst. Studies done by Ashraf et al had similar findings. Amod Sawant et al, Thakkar et al had follicular cyst as the commonest non neoplastic lesion [13-16].

Commonest neoplastic lesion encountered in present study was mature cystic teratoma (32.78%) which was in concordance with study done by Charel M et al.[11] Mondal et al. had serous cystadenoma (32.57%) as the commonest histiologic type followed by mucinous cyst adenoma (15.71%).

Ovarian lesions contribute a major proportion of the cases of abdominal and pelvic swellings in the female population. The prevalence of various ovarian pathologies varies according to age. Radiological investigations like transvaginal ultrasonography and CT scan are helpful in accessing size, spread and probable diagnosis of ovarian lesions. Many studies concluded that grossly most of non-neoplastic and neoplastic ovarian lesions present as cystic swellings; while malignant and borderline lesions are partly solid and partly cystic. However, HPE confirmation always remains the gold standard for the diagnosis. It also helps in clinical staging and appropriate management of the patients.

Conclusion

Ovarian lesions are common in younger age groups. Most of the cystic lesions of the ovary are asymptomatic. In present study, follicular cyst was the most common diagnosis amongst the non-neoplastic lesions of the ovary. Hence histopathological examination of ovarian lesions is important for exact diagnosis and proper management.

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