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HISTOPATHOLOGICAL SPECTRUM OF OVARIAN LESIONS AT A TERTIARY CARE HOSPITAL IN DHAKA, BANGLADESH

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ABSTRACT

Background: Ovarian lesions encompass a diverse range of non-neoplastic functional cysts and neoplastic tumors, arising from epithelial, germ cell, and stromal origins, posing diagnostic challenges due to their varied presentations mimicking pelvic masses. In developing countries like Bangladesh, underreporting limits data despite rising incidence trends observed in similar regions. **Objective:** This study aimed to evaluate the histopathological spectrum of both benign and malignant ovarian lesions in a tertiary care hospital in Dhaka, Bangladesh, to contribute valuable local and global data on their prevalence, age distribution, laterality, and clinical-pathological correlations. **Materials and Method:** A retrospective analysis of 274 histopathological reports from ovarian specimens (oophorectomies or salpingo-oophorectomies) was conducted at the Pathology Department, Medical College for Women and Hospital, Dhaka, using data from January 2023 to December 2024. Inclusion criteria encompassed adequate Hematoxylin and Eosin-stained slides with confirmed diagnoses and basic clinical data (age, side); exclusions were non-diagnostic, autolyzed, or non-ovarian cases. Data on demographics, clinical diagnoses, and pathology were analyzed descriptively using frequencies, percentages, and chi-square tests via SPSS version 26.0, following ethical approval.**Results:** The mean age was 35.45 ± 11.06 years, with 33.2% in the 40-49 group; lesions were left-sided (43.1%), right-sided (33.2%), or bilateral (23.7%). Pathologically, non-neoplastic cysts dominated: follicular (19.7%), corpus luteal (19.0%), endometriotic cyst (19.0%); benign tumors included serous cystadenoma (15.7%) and mature teratoma (12.8%). Benign lesions comprised 98.2% (269 cases), malignant 1.8% (5 cases, e.g., spindle cell sarcoma); a significant age association existed (p=0.013), with most under 50 years. Clinically, 53.6% were undiagnosed preoperatively.**Conclusion:** Functional cysts were predominant, followed by surface epithelial benign tumors; malignancies were rare, likely due to underreporting and lower life expectancy limiting elderly cases. Histopathological evaluation remains crucial for accurate diagnosis and management; further prospective studies with molecular markers are recommended to enhance ovarian lesion classification and awareness in Bangladesh.

Keywords: Ovarian lesions, Histopathological spectrum, Functional cysts, Benign tumors, Serous cystadenoma, Bangladesh.

INTRODUCTION

Ovaries are of significant importance to the female body and is vital for reproduction and propagation of the human progeny[1].

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The lesions of the ovary constitute of a wide range of complex neoplasms that may arise from a variety of cells including specialized hormone secreting embryonal and germinal cells, epithelial cells, connective tissue cells[2]. Globally, 3% of all female cancers constitutes of the ovarian cancer and 27% of all genital cancers in women are due to tumors of the ovary. Fifty two percent of demises resulting from genital cancer is due to ovarian tumors [3].

The ovaries face endocrine perturbations and trauma-induced insults during the regular monthly ovarian cycles particularly during ovulation. The incessant ovulation hypothesis appears to be the commonly cited ovarian cancer mechanism which suggests that the surface epithelium of ovaries are traumatized during ovulation leading to proliferating and creation of an environment which aggravates malignant transformation [4]. This may explain why the oral contraceptive use, early menopause, late menarche, breast feeding, and multiparity may have a protective effect on the ovaries since these factors reduce the number of ovulations [5].

The masses that may develop within the ovaries are either pathological or functional lesions. The ones that are functional include mainly cystic lesions and are the most commonly noted lesions of the ovaries[6]. Most of these cysts are simple, and a small number of them have complex architecture. Ninety percent of these cysts are spontaneously resolved[7]. Failure to ovulate may result in the formation of such cysts in the second decade of life of the young women. A small number of cysts also develop in perimenopausal and postmenopausal women. The lesions that are pathological are mainly tumors that may be benign, borderline, and malignant. These tumors are rare in adolescents and during childhood as only 2% of such tumors have been reported in children[7,8]. While benign lesions mostly occur in women of childbearing age, malignant lesions are observed commonly in older women[9]. The World Health Organization has classified the ovarian carcinoma in 2014[10,11]. Those suffering from cancers of the ovaries present commonly with pain in the abdomen, feeling of a lump or menstrual abnormality. About 60% of all ovarian cancers and over 90% of the malignant tumors of the ovaries are of epithelial origin[1].

In developing nations the under reporting of most cases result in low data availability regarding ovarian lesions despite being the most abundant gynecological issue worldwide. The ovarian cancer incidence rate has been noted to be highest in industrialized countries of the west and lowest in developing nations. However, in countries like India the age standardized prevalence for ovarian cancer is on the steady rise (3% per year) and also remains the 3rd leading cause of cancers among females[12,13].

Both non-neoplastic and neoplastic lesions of the ovary are challenging for the gynecological oncologist. Certain non-neoplastic lesions of the ovary may mimic an ovarian neoplasm and may present as pelvic mass. Thus, in order to provide appropriate management it is vital to recognize these lesions properly and histopathological identification is of great value. The degree of differentiation of the tumors need to be assessed histopathologically to predict the prognosis of these tumors. This study aimed to evaluate the histopathological spectrum of ovarian lesions (both malignant and benign) in a tertiary care hospital in Dhaka, Bangladesh to contribute to the growing body of data on ovarian lesions locally and globally.

MATERIALS AND METHOD

This retrospective research was conducted in the Pathology department, Medical College for Women and Hospital, Dhaka, Bangladesh using histopathology reports of ovarian lesions recorded in the Histopathology and Cytopathology Laboratory of Medical College for Women and Hospital during the period from January 2023 to December 2024.

The study included data that fulfilled the following criteria : a) All female patients who underwent unilateral or bilateral oophorectomy (with or without hysterectomy) during the defined study period in the selected hospital; b)Ovarian specimens (oophorectomy/ salpingo-oophorectomy) in which a definite histopathological diagnosis of an ovarian lesion (non-neoplastic or neoplastic) was available on routine Hematoxylin and Eosin (H&E) ; c) Specimens with adequate tissue and fixation allowing reliable histopathological evaluation (no gross autolysis or major processing artifact); d) Cases with minimal essential clinical data available in records (at least age and side of lesion).The research excluded incomplete information or non-diagnostic samples. It also excluded non-ovarian lesions, metastatic tumors from non-ovarian primaries, severely autolyzed/inadequate specimens.

Study Procedure

The information was recorded in a data collection sheet. The data collection sheet included the laboratory accession number, age of the patient, name of the surgical specimen/ tissue sent for histopathology, clinical diagnosis, and the final histopathological diagnosis.

Sample size

Sample size was calculated using the single-population proportion formula $n=Z^2p(1-p)/d^2$, considering a 95% confidence level ($Z = 1.96$), an expected proportion of malignant/borderline ovarian tumors of 23% from previous clinicopathological studies [9], and a 5% margin of error, yielding a minimum sample size of approximately 274 cases. All eligible oophorectomy specimens meeting the inclusion criteria during the study period will be included until at least 274 cases are obtained.

Data Interpretation: The data was interpreted using descriptive statistics. The data was interpreted as frequency and percentage.

Statistical Analysis: The analysis of the data was carried out using SPSS version 26.0 software (Armonk, NY: IBM Corp.) . The results were presented in tables and graphs.

Ethical Considerations

Ethical approval was obtained from the institutional review board of the Medical College for Women and Hospital, Dhaka, Bangladesh (memo no. MCWH/Ethical Committee/2026/04).

RESULTS

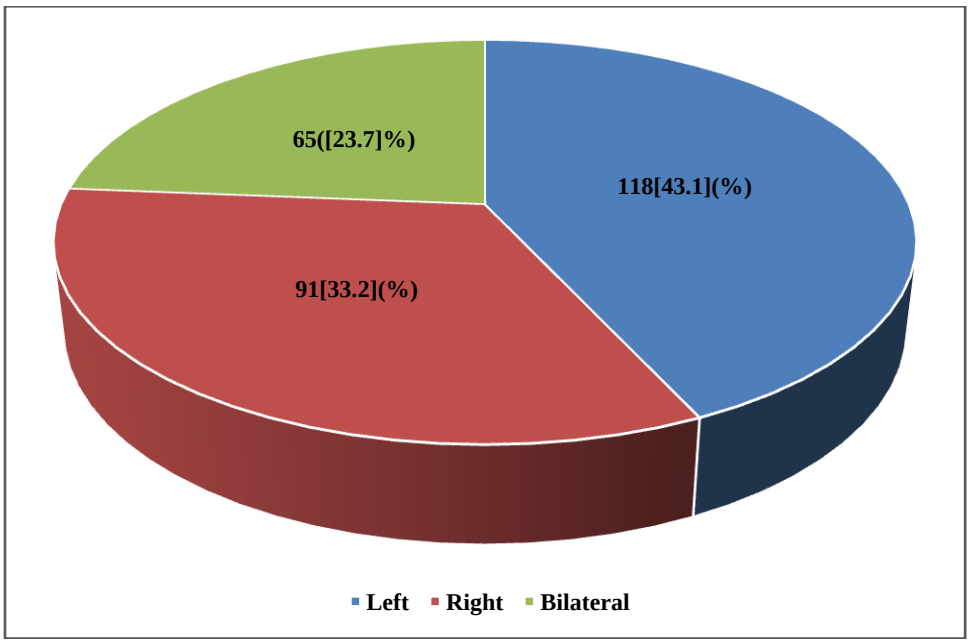
In this study, mean age was 35.45±11.06 years and majority (33.2%) of the study subjects were in age group of 40-49 years of age (Table 1). We observed that 118 (43.1%) females had left sided ovarian lesion, 91 (33.2%) had right sided and 65 (23.7%) females had bilateral ovarian pathology (Figure 1). The patients were diagnosed clinically as adnexal cyst (20; 7.3%), chocolate cyst (17; 6.2%), dermoid cyst (10; 3.6%), ovarian cyst (27; 9.9%), hemorrhagic cyst (2; 0.7%), twisted ovarian cyst (4; 1.5%), adenomyosis (14; 5.1%), adenomyoma (2; 0.7%), cystadenoma (1; 0.4%), endometrial polyp (1; 0.4%), fibroid uterus (22; 8.0%), cervical intraepithelial neoplasia grade II (CIN II) (1; 0.4%) and dysfunctional uterine bleeding (9; 3.3%). Others remained undiagnosed (147; 53.6%) (Table 2). In this study, 178 patients were identified as non-neoplastic lesions. They were diagnosed pathologically as simple cyst (20; 7.3%), corpus luteal cyst (52; 19.0%), follicular cyst (54; 19.7%), endometriotic cyst (52; 19.0%), Mullerian cyst (1; 0.4%), ectopic pregnancy (1; 0.4%), pregnancy luteoma (1; 0.4%), chronic salpingo-oophoritis (1; 0.4%), tubo-ovarian abscess (1; 0.4%), suppurative oophoritis (1; 0.4%) and tubo-ovarian mass (1; 0.4%). About 110 breast lesions were identified as benign. They were detected as fibroma (2; 0.7%), serous cystadenoma (43; 15.7%), mucinous

cystadenoma (20; 7.3%), Seromucinous cystadenoma (1; 0.4%), mature cystic teratoma (dermoid cyst) (35; 12.8%) and twisted ovarian cyst (9; 3.3%). Only one (0.4%) was mucinous borderline tumour and 5 patients had malignant lesion. Among the malignant lesion 2(0.7%) had serous carcinoma, 2(0.7%) had mucinous carcinoma and 1 (0.4%) had spindle cell ovarian sarcoma (Table 3). Majority of the women were diagnosed as benign (269; 98.2%) and only 5 (1.8%) were diagnosed as malignant (figure 2). We found that majority benign (92.2%) and malignant (80%) ovarian lesion patients were in age group of <50 years and had left sided involvement (42.8%; 60%). Statistically significant (p=0.013) association were observed between age and pathological types of ovarian lesion (Table 4). Figure 3 to figure 7 displyed the photomicrographs of the various histopathogical findings of ovarian lesion.

Table 1: Distribution of study subjects according to age (N=274)

Age (years)	Frequency	Percentage (%)
10 to 19	16	5.8
20 to 29	73	26.6
30-39	72	26.3
40-49	91	33.2
50-59	16	5.8
≥60	6	2.2
Mean±SD	35.45±11.06	

N=Total number of subjects. Data were expressed as frequency, percentage and Mean±SD



Data were expressed as frequency and percentage

Figure 1: Distribution of study subjects according to tumor location (N=274)

Table 2: Distribution of study subjects according to clinical diagnosis (N=274)

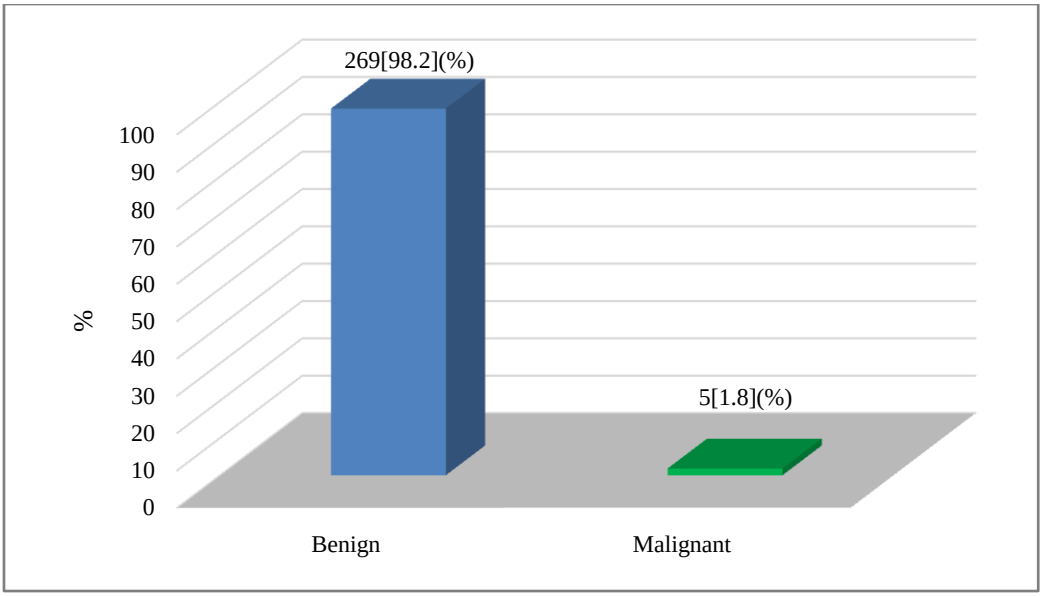
Clinical Diagnosis	Frequency	Percentage (%)
Adnexal cyst	20	7.3
Chocolate cyst	17	6.2
Dermoid cyst	10	3.6
Ovarian cyst	27	9.9
Hemorrhagic cyst	2	0.7
Twisted ovarian cyst	4	1.5
Adenomyosis	14	5.1
Adenomyoma	2	0.7
Cystadenoma	1	0.4
Endometrial polyp	1	0.4
Fibroid uterus	22	8.0
Cervical Intraepithelial Neoplasia Grade II (CIN II)	1	0.4
Dysfunctional uterine bleeding	9	3.3
Undiagnosed	147	53.6

N=Total number of subjects. Multiple response was present, Data were expressed as frequency and percentage About 147 (53.6%) patients remain undiagnosed clinically.

Table 3: Distribution of study subjects according to pathological findings (N=274)

Pathological findings	Frequency	Percentage (%)
Non-neoplastic lesions		
Simple cyst	20	7.3
Follicular cyst	54	19.7
Corpus luteal cyst	52	19.0
Endometriotic cyst	52	19.0
Mullerian cyst	1	0.4
Ectopic pregnancy	1	0.4
Pregnancy luteoma	1	0.4
Chronic salpingo-oophoritis	1	0.4
Tubo-ovarian Abscess	1	0.4
Suppurative oophoritis	1	0.4
Neoplastic lesion		
Benign		
Fibroma	2	0.7
Serous cystadenoma	43	15.7
Mucinous cystadenoma	20	7.3
Seromucinous cystadenoma	1	0.4
Mature cystic teratoma (dermoid cyst)	35	12.8
Twisted ovarian cyst	9	3.3
Borderline tumour.		
Mucinous borderline tumour	1	0.4
Malignant		
Serous carcinoma	2	0.7
Mucinous carcinoma	2	0.7
Spindle cell ovarian sarcoma	1	0.4

N=Total number of subjects; Multiple response was present, Data were expressed as frequency and percentage



Data were expressed as frequency and percentage

Figure 2: Distribution of study subjects according to pathological types (N=274)

Table4: Association of age and locationwith pathological types (N=274)

Variable	Benign (n=269)	Malignant (n=5)	*p* value
Age (Years)			
<50	248 (92.2%)	4 (80%)	0.013*
≥50	21 (7.8%)	1(20%)	
Tumor location			
Left	115 (42.8%)	3 (60%)	0.648
Right	89 (33.1%)	2 (40%)	
Bilateral	65 (24.2%)	0 (0%)	

Data were expressed as frequency and percentage, Chi Square test was performed, *=significant

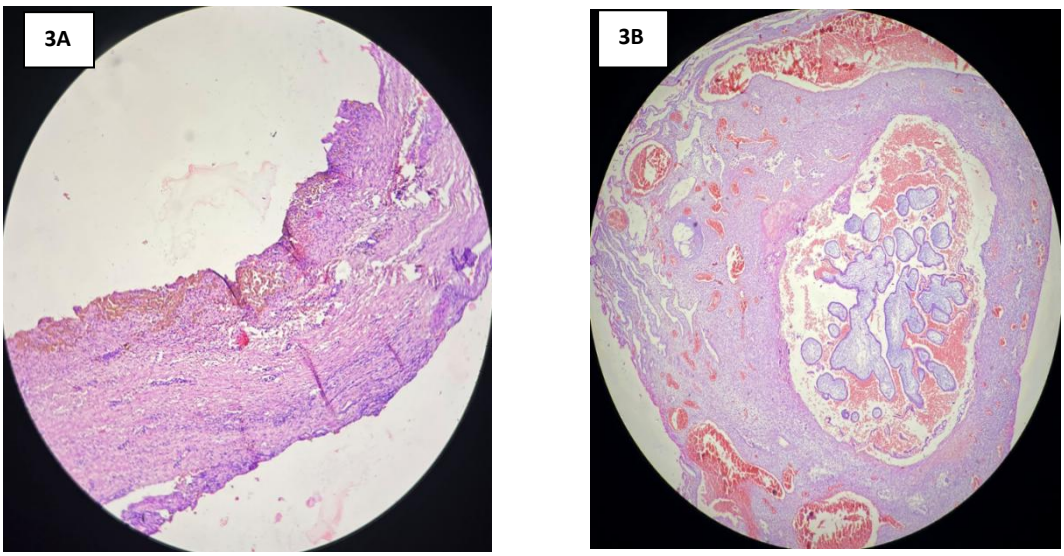


Figure 3. (A) Photomicrograph of an endometriotic cyst showing a cyst wall lined by hemosiderin-laden macrophages and composed of fibrocollagenous tissue (H&E ×100).(B) Photomicrograph of an ovarian ectopic pregnancy showing chorionic villi with trophoblastic proliferation embedded within ovarian stroma, associated with hemorrhage (H&E ×400).

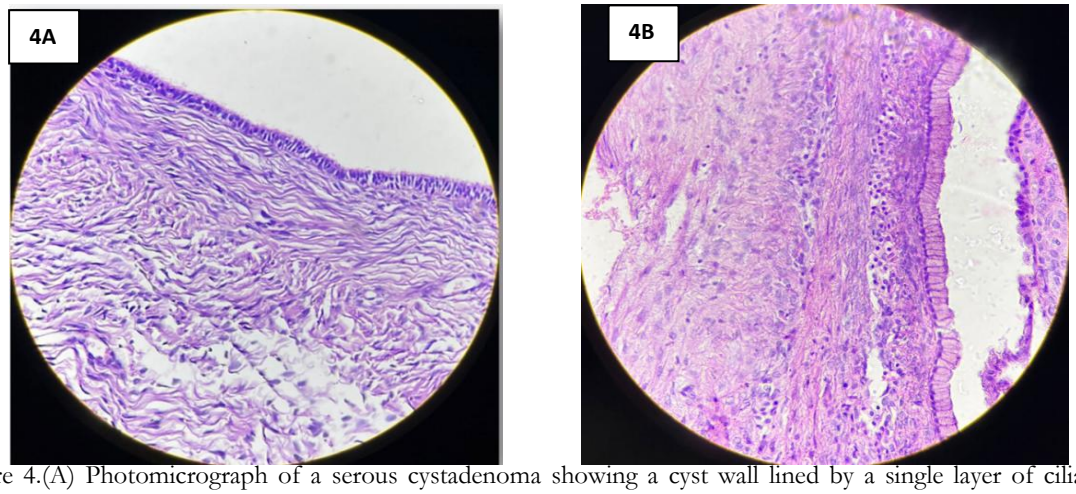


Figure 4.(A) Photomicrograph of a serous cystadenoma showing a cyst wall lined by a single layer of ciliated columnar epithelium overlying fibrous stroma (H&E ×400).(B) Photomicrograph of a mucinous cystadenoma showing a cyst wall lined by tall mucin-secreting columnar epithelium overlying fibrous stroma (H&E ×400).

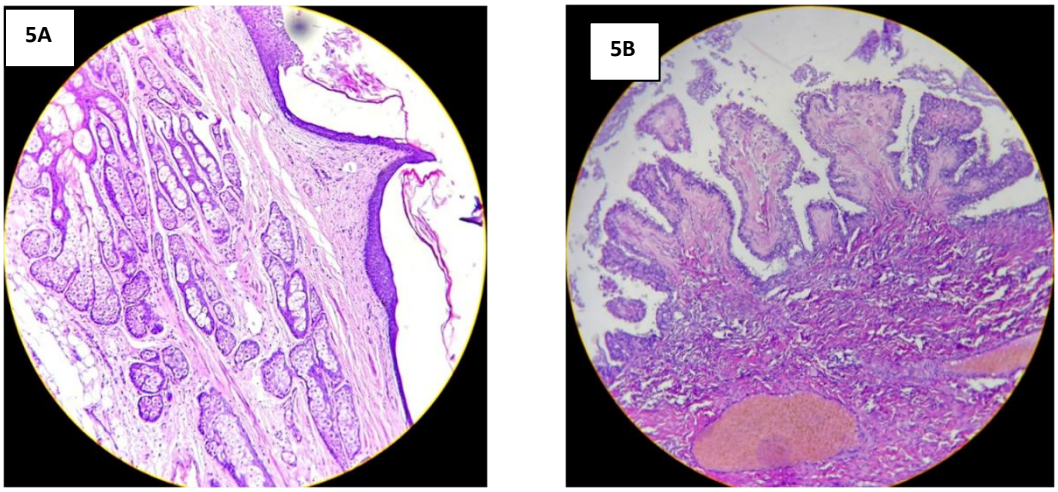


Figure 5 (A) Photomicrograph of a mature cystic teratoma showing cyst wall lined by keratinized stratified squamous epithelium with underlying adnexal structures (H&E ×400). (B) Photomicrograph of a mucinous borderline tumor showing papillary architecture with epithelial stratification and mild to moderate atypia without stromal invasion (H&E ×400).

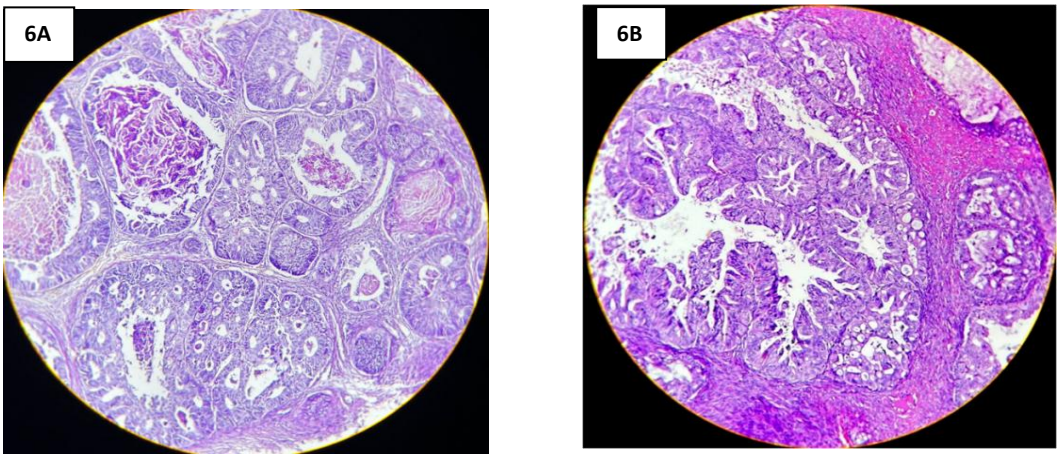


Figure 6(A) Photomicrograph of serous carcinoma showing complex glandular architecture with marked nuclear atypia, stratification, stromal invasion, and luminal necrotic debris (H&E ×400).(B) Photomicrograph of mucinous carcinoma showing complex papillary architecture lined by atypical mucinous epithelium with stromal invasion (H&E ×400).

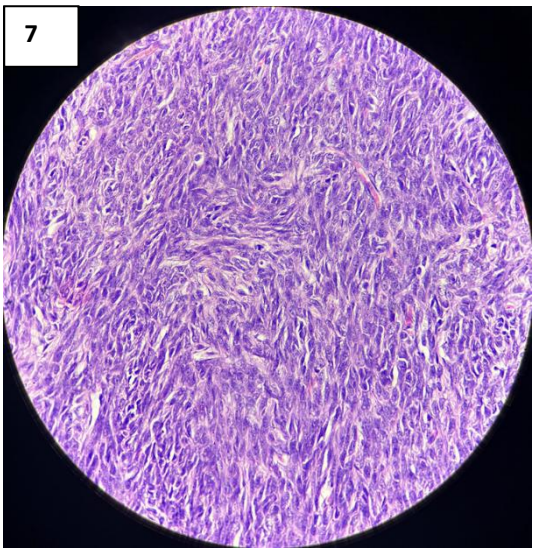


Figure 7: Photomicrograph of spindle cell ovarian sarcoma showing intersecting fascicles of spindle-shaped tumor cells with marked nuclear atypia and frequent atypical mitotic figures (H&E ×400).

DISCUSSION

This research comprised of 274 cases and the mean age of diagnosis of all lesions of ovary was 35.45±11.06 years with the majority occurring in the age group of 40-49 years of age. These findings are similar to that of the study done by Parmar et al [1]. However, our findings were in contrast to those observed by Srivastava et al.[12] and Makwana at al.[14] who noted most of the ovarian tumors appeared in the 3rd decade of life.

In this research, the ovarian lesions most commonly found were non-neoplastic, of which a large majority were physiological functional cysts. Similar reports were made by Srivastava et al.[12], Wasim et al, [15], and Arab et al.[16]. However, Ashraf et al.[17] found benign neoplastic tumors to be the most commonly noted ovarian lesion. Guerriero at al observed Endometroma to be the majority of the ovarian mass followed by functional cysts [18]. de Kroon et al also reported endometroma to be the most common ovarian lesion followed by dermoid cyst and other functional cysts [19].

Similar to the findings of Srivastava et al.[12] who noted the most frequently occurring cyst to be follicular cyst (28.78%) ,our study observed the follicular cyst had highest frequency (19.7%). They also noted the second highest frequency to be of corpus luteal cysts (25.54%) which was also the case in this research with such cysts frequency at 19%. Our findings are also in line with that reported by Yasmin et al. who found follicular cysts to be the most common functional cyst [20]. However, other studies findings vary from that in our research. Choi et al. reported corpus luteum cyst to be the most commonly occurring ovarian lesion [21]. Ashraf at al also reported similar findings [17]. Such variations may be attributed to genetic, environmental, and hormonal differences.

Majority of the women were diagnosed as benign (269; 98.2%) and only 5 (1.8%) were diagnosed as malignant. Majority of benign tumors (92.2%) and malignant tumors (80%) occurred in women aged less than 50 years. This may be due to inability to obtain more data of women above the age of 50 years since ovarian lesions are of often underreported[1]. Our findings were in accordance to that observed by Parmar et al [1]. They also noted that majority

of the cases were benign (81.1%) and occurred in younger age group of 31 years to 40 years. However, they found a greater number of malignancy cases (14.7%) compared to our study which may be due to under reporting or inadequate data preservation in the laboratory. Similar to our study Gupta et al.[22], Ibrahimkhil et al. [23], and Akakpo et al [24] noted majority of the cases to be benign followed by malignant ovarian tumourcases. Farag et al. [25] also observed a higher frequency of cases (32.2%) in the age group of less than 50 years.

This study noted the majority of the benign tumors to be of surface epithelial origin including serous cyst adenoma (15.7% of all ovarian lesions) and mucinous cyst adenoma (7.3% of all ovarian lesions) followed by sex cord stromal tumor (Fibroma 0.7%). Globally the most common benign tumor of ovary is found to arise from surface epithelium[12] .Pilli et al.[26] also noted the most common benign tumor to be of surface epithelial origin. However, Srivastava et al [12] noted Germ cell tumor to be the most common benign tumor. This variation may be attributed to differences in environments, genetics and hormone levels.

Our study found very few number of cases of malignancies similar to the findings of Srivastava et al. [12] who suggested the reason to be lack of awareness and low life expectancy of women as very few women live in to their 8th and 9th decade where the malignant changes in the ovary become more prevalent. Also the ovarian lesions in our study were commonly observed in the left ovary. A study done on the anatomical distribution of benign tumor of ovary noted cysts of Morgagni (52.3%;p<0.001) and endometriomas (61.8%;p <0.01) were predominantly found in the left-sided ovary[27]. However, other study done by Kheiri et al. found higher frequency of lesions in the right ovary[28]. This difference may be due to difference in study population, report preservation and frequency of reporting.

LIMITATIONS

This was a retrospective study and the limited sample size reduces the ability to categorize effectively tumor cases. Biochemical parameters like tumor markers, genetic studies, and immunohistochemistry was not included in the study due resource limitation. Further research is needed to contribute to precise diagnosis. Molecular and genetic studies will aid in better classifying ovarian tumors and building awareness.

CONCLUSION

Functional cysts were the most abundant ovarian lesion in this research. This was followed by benign tumors of which the surface epithelial tumors were the common variety. Malignant tumors were least common which may be due to under reporting or due to low life expectancy since malignant changes are more common in the 8th and 9th decade. Such studies are necessary to build awareness of the significance of histopathological studies of the ovarian lesion. More such research are needed to aid in better classification of ovarian tumors as well as to encourage early reporting of ovarian lesions by the women.

CONFLICT OF INTEREST

There is no conflict of interest.

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