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Clinicopathological Analysis of Ovarian Tumours: The Tertiary Cancer Care Institutional Perspective

[1]Archana Rathod, [2]Bhakti Kalyankar, [3]Jyoti Kodgire, [4]Narendra Patil, [5]Shrikrishna Chavan, [6]Sanjay Pagare, [7]Rakesh Ajmera and [8]L. Deeksha

[1-6]Department of Gynecological Oncology, State Cancer Hospital, Aurangabad (MS), India

[7]Department of Onco Pathology, State Cancer Hospital, Aurangabad (MS), Dr L Deeksha, House officer, Yashoda Hospital, Hyderabad, India

[8]Yashoda Hospital ,Hyderabad

ABSTRACT

Ovarian malignancy ranks as the second most prevalent cancer of the female reproductive system, accounting for roughly 30% of all cancers affecting the female genital tract. GLOBOCAN 2020 statistics reveal that 1.6% of new cases and 2.1% of deaths across all sites are attributed to ovarian cancer. Ovarian tumors exhibit diverse histogenesis, clinical behavior and malignant potential. Early and accurate diagnosis is critical for effective management and favorable prognosis. The prognosis of ovarian tumors hinges on histological subtype, tumor stage and grade. Histological subtyping is conducted using the WHO classification and the International Federation of Gynecology and Obstetrics staging system. This study aims to investigate the clinico-pathological patterns of ovarian tumors, contributing valuable data to the current understanding of their demography and clinicopathological spectrum. Additionally the study seeks to classify these tumors according to the WHO classification system. A retrospective observational study was conducted, encompassing 205 patients who presented with ovarian tumors and underwent surgical intervention over a 10-year period (January-December 2013-2022) at the Department of Gynecological Oncology. Informed consent was obtained from all participants. The study included women who underwent surgery for ovariotomy alone or in conjunction with hysterectomy and staging laparotomy. Cases managed conservatively were excluded. Data pertaining to age, clinical symptoms and histopathology were collected. Histopathological examination of the specimens was performed by the Department of Onco-pathology of the hospital, adhering to appropriate staining procedures (Hematoxylin and Eosin staining). The histopathological reports (HPR) were based on the WHO classification of ovarian tumors (2010). Categorical variables were presented as frequencies and percentages (%) while continuous variables were expressed as Mean±SD and median. Data were entered into an MS Excel spreadsheet, and tables were generated for analysis. Among the 205 patients the median age of presentation was 46.5 years (range 8-77 years). Bilateral tumors were detected in 39.45% of cases. Malignant tumors constituted 60.54% of the total, while benign and borderline tumors accounted for 29.18% and 10.27%, respectively. Epithelial tumors represented the major bulk of neoplasms at 82.16%, followed by germ cell tumors (10.27%) and sex cord stromal tumors (6.48%). Within the category of surface epithelial tumors, serous tumors were the most common, accounting for 65.78%. Serous cystadenoma emerged as the most frequently encountered benign tumor, followed by mucinous cystadenoma. Serous cystadenocarcinoma was identified as the most prevalent malignant neoplasm, followed by mucinous cystadenocarcinoma. Among germ cell tumors, mature cystic teratoma held the majority at 42.10%. Granulosa cell tumors dominated the sex cord stromal tumor category, constituting 66.66% of all cases. The study demonstrates that surface epithelial tumors are the most common type of ovarian tumor, followed by germ cell tumors. Notably the study encountered a higher prevalence of malignant ovarian tumors, likely due to the tertiary care setting. Approximately 39.45% of cases were diagnosed with bilateral tumors and the peak incidence was observed in the 41-50 age group. These findings provide valuable insights into the clinico-pathological spectrum of ovarian tumors, contributing to the advancement of research and clinical practice in this area.

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Key Words
Humerus, tubercle, morphometry

Corresponding Author
Narendra Patil,
Department of Gynecological Oncology, State Cancer Hospital, Aurangabad (MS), India
drnaru2002@gmail.com

Author Designation
[1]Professor and HOD
[2]Professor
[3-7]Assistant Professor
[8]House officer

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INTRODUCTION

GLOBOCAN estimates indicate there were 314 000 women diagnosed with ovarian cancer in 2020 and 207,000 ovarian cancer deaths, with the disease ranking eighth in terms of both cancer incidence and mortality among women worldwide[1]. Ovarian cancer ranked among top ten cancers in 10 out of 28 Population-Based Cancer Registries[2]. Various molecular insults are seen in different hereditary cancer syndromes such as hereditary breast and ovary cancer syndrome (HBOCS) and Lynch syndrome that leads to development of different morphological types of ovarian cancer. Accurate histological typing of ovarian tumors suggests screening of the first degree relatives for these cancer syndromes and also suggests targeted therapy for the same. Age specific incidence rate showed that ovarian cancer increases from 35 years of age and peaks between 55-64 years of age. Mean age of menopause in India ranges from 41.9-49.4 years in different studies with average being 45 years. Ovarian neoplasms present late in the course of disease with diverse morphology with relatively mild or vague symptoms[3]. Many a times detected incidentally or with metastasis. Family history and nulliparity play important role in etiopathogenesis. Early accurate diagnosis is crucial for better management and good prognosis.

Prognosis of ovarian tumors is dependent on histological subtype, tumor stage and grade. Histological subtyping is done with WHO classification and International Federation of Gynaecology and obstetrics staging systemOvarian tumors present in a wide spectrum of histopathological patterns. It is essential to determine different histological patterns of ovarian tumors, which helps in the planning of diagnosis, prognosis and treatment of ovarian tumors[4].

MATERIALS AND METHODS

This study was done retrospectively in the department of Gynecological oncology. All the cases of ovarian tumors (on either or both sides) which were admitted in the department during the period of 10 years (2013-2022) were included in the study after an informed consent from the patients. Inclusion criteria comprised of the women who underwent surgery for ovariotomy alone or along with hysterectomy and staging laparotomy. Conservatively managed cases were excluded from the study. Data related to age clinical symptoms and histopathology were collected. Histopathological examination of the specimens was carried out at by the Department of Onco pathology of the hospital by following appropriate staining (Hematoxylin and eosin staining). The histopathological reports (HPR) were based on WHO classification of ovarian tumors (2010).

Statistical analysis: Categorical variables were presented in number and percentage (%) and continuous variables as Mean±SD and median. The data were entered in MS EXCEL spreadsheet and tables were generated. Ethical considerations study was conducted on specimens coming routinely to pathology department. Consent was routinely taken. Confidentiality of the patient was maintained during every stage of the study. No other ethical issues involved. Study was commenced only after getting ethical committee clearance.

RESULTS

Among 205 patients the median age of presentation was 46.5 years(8-77 years). 39.45% tumours were bilateral. 60.54% were malignant, 29.18%were benign while 10.27% were borderline tumours. Epithelial tumours formed the main bulk of neoplasm (82.16%) followed by germ cell tumours (10.27%) and sex cord stromal tumours (6.48%). Among the surface epithelial tumours ,serous tumors (65.78%) were commonest. Serous cystadenoma was the most common type of benign tumour followed by mucinous cystadenoma. Serous cystadenocarcinoma was the most common type of malignant neoplasm followed by mucinous cystadenocarcinoma. Among the germ cell tumours, mature cystic teratoma (42.10%) were commonest germ cell tumors. Granulosa cell tumours (66.66%) were commonest among the sex cord stromal tumors.

DISCUSSIONS

Ovarian neoplasms exhibit diverse histogenesis, clinical behavior and malignant potential, contributing significantly to cancer-related fatalities within the female genital tract. The challenges in early ovarian tumor detection underscore the need for comprehensive studies. Our research aims to explore the frequency of various histological ovarian tumor types and their age distribution. Over a 10-year period, we analyzed 205 cases, revealing 61 benign, 122 malignant and 22 borderline tumors.

Interestingly, our findings diverged from existing literature, with malignant tumors surpassing benign ones. Unilateral cases constituted 6.54%, while bilateral cases were at 39.45%, including one metastatic instance. The majority of cases occurred in the 4-6th decades, aligning with Kar's observations[5] contrary to Pilli[6] and Ramachandran[7] who reported a higher incidence in the 20-39 years age range.

Histologically, we classified 205 ovarian lesions according to WHO standards. Our results aligned with Pilli,[6] Gupta[9] and Kar[5] although Gupta[9] reported a relatively higher number of germ cell tumors. Sex cord stromal tumors, including fibroma, thecofibroma and granulosa cell tumor, were observed, with fibroma and

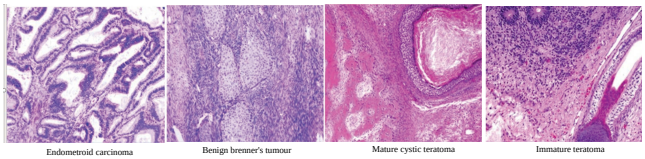

Fig. 1: Tumor, Serous and Mu

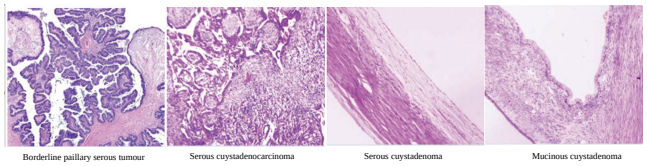

Fig. 2: Endometroid, Brenners and Teratoma

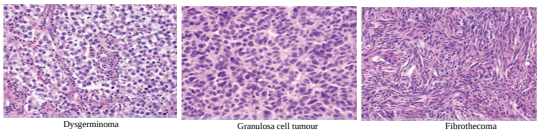

Fig. 3: Dysgerminoma

Table 1: Distribution of ovarian tumors according to age group

Age	No. of Cases	Percentage
1-10	5	2.70
11-20	7	1.08
21-30	19	8.64
31-40	37	18.37
41-50	59	28.72
51-60	49	24.86
61-70	28	13.5115
71-80	2	1.08
Total	205	100

Table 2: Distribution of ovarian tumor on gross appearance

Solid	Cystic	Solid-cystic
32	67	106
26	64	95
14.05%	34.59%	51.35%

Table 3: Laterality of the tumor

Total no	Unilateral	Bilateral
185	127	78
	112	73
	60.54%	39.45

Table 4: Distribution of cases according to histological type of ovarian tumor

Histological Type	No. of Cases	Percentage
Benign	61	29.18
Borderline	22	10.27
Malignant	122	60.54

the cofibroma displaying benign behavior, while granulosa cell tumor had uncertain malignant potential. The most prevalent benign tumor in our study was serous cystadenoma, followed by mature cystic teratoma, consistent with Gupta[9], Bukhari[11] and Momtahen[12] Notably, 34.59% of ovarian tumors had cystic consistency, while 51.35% of ovarian tumors exhibited both solid and cystic characteristics. Our findings align with Couto[8] Gupta[9] and Misra[13]indicating a high incidence of malignant tumors with both solid and cystic consistency.

Table 5: Distribution of tumor according to pathological types

Types	Cases no of cases	Percentage
Surface Epithelial Tumor	162	82.16
Serious Tumor	103	65.78
Benign	24	24
Borderline	7	5
Malignant	72	71
Mucinous Tumor	59	34.21
Benign	18	34.61
Borderline	17	26.92
Malignant	20	34.61
Endometroid Tumor	4	3.84
Brenner Tumor	0	0
Sex Card Stromal Tumors	17	6.48
Granulosa Cell Tumor	11	66.66
Fibroma	4	16.66
Theca Fibroma	2	16.66
Germ Cell Tumors	23	10.27
Dysgeminoma	7	26.31
Yolk sac Tumor	1	5.26
Mature Cystic Teratoma	9	42.10
Immature Cystic Teratoma	6	26.31
Metastatic Tumor	1	0.5
Myxoid Leiomyosarcoma	1	0.5
Steroid Cell Tumor	1	0.5

Table 6: Comparison of Percentage incidence of benign, borderline and malignant tumors in different studies and the present study

Authors	Benign	Malignan	Borderline
Pilli[6]	76%	21.2%	2.8%
Couto[8]	80.76%	16.91%	2.33%
Gupta N[9]	72.9%	4.2%	22.9
Maheshwari V[10]	71.7%	23.7%	4.4%
Present Study	29.18%	60.54%	10.27%

Table 7: Relative percentage of different histological types of ovarian tumors in different studies and the present study

Authors	Epithelial	Sex cord	Germ cell tumo	Metastatic
Pilli[6]	71%	7%	21%	0.70%
Kar[5]	79%	1.50%	16%	1.20%
Gupta N[9]	54.70%	7.06%	31%	6.18%
Present Study	82.16%	6.48%	10.27%	0.5%

CONCLUSION

Surface epithelial tumors predominated in our tertiary cancer care center, emphasizing the need for heightened clinical awareness and targeted screening. While germ cell tumors followed in frequency, their substantial representation underscores the importance of comprehensive evaluation. The prevalence of malignant ovarian tumors underscores our center's pivotal role in managing advanced-stage malignancies. Notably, almost 40% of cases demonstrated bilateral ovarian involvement, necessitating comprehensive diagnostic approaches. The age distribution, with the majority of tumors diagnosed in the 41-50 age range, highlights the importance of age-specific risk assessment. These insights underscore the necessity for tailored clinical strategies, early detection initiatives and multidisciplinary collaboration for optimal patient outcomes in ovarian tumorigenesis.

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