Original Article

Histopathological Study of Spectrum of Ovarian Neoplasms: A 2 year Study

Lavanya Kanigiri[1], Sanjeev Kumar Srigiri[2], Sravani Ramaa Modey[3], RavinderThota[4]

[1, 2, 3] Assistant Professor
[4] Professor &HOD
Department of Pathology
Chalmeda Anand Rao
Institute of Medical Sciences
Karimnagar- 505001
Telangana, India.

CORRESPONDENCE:

Dr. Sanjeev Kumar Srigiri,
MD(Pathology)
Assistant Professor
Department of Pathology
Chalmeda Anand Rao
Institute of Medical Sciences
Karimnagar- 505001
Telangana, India.
Email :
sanjeev777714@gmail.com

ABSTRACT

Background and Aim: Ovarian cancer accounts for 3% of all cancers in females. Ovarian tumors present with a wide spectrum of clinical, morphological and histopathological features. Treatment and prognosis of these tumors is based upon accurate surgical staging and a thorough pathological evaluation. Early diagnosis is difficult due to its asymptomatic nature, inaccessible site and limited use of FNAC. The aim of the study was to study the incidence and histopathological spectrum of ovarian neoplasms.

Materials and Methods: This retrospective study was done for a period of 2 years in the Department of Pathology, Chalmeda Anand Rao Institute of Medical Sciences, Karimnagar. All the ovarian specimens received were fixed in 10% formalin for 24 hours. Processed tissue sections stained with haematoxylin and eosin were analysed.

Results: In the present study, 90 cases of ovarian tumors were studied during the period of 2 years. Age range from 15-80 years with majority of cases included among 41-50 years age group with 30(33.3%) cases. Overall, benign tumors were 58(64.5%), malignant were 30 (33.3%)) and border line were 2(2.2%). Epithelial tumors (87.8%) formed the majority in cases followed by germ cell tumors (8.9%), sex cord stromal tumors (2.2%) and others (1.1%). Among the surface epithelial tumors, serous cystadenomas were most common (32 cases; 35.6%).

Conclusion: Ovary is a common site of tumor in the female genital tract and usually presents with a variety of clinical, morphological and histological features. Surface epithelial tumors are the most common type of ovarian tumors. A precise histopathological diagnosis and staging is important for therapeutic and prognostic purpose.

Keywords: Ovarian tumors, benign, malignant

INTRODUCTION

Ovarian cancer is the seventh most common cancer in women worldwide and eighth most common cause of cancer death.[1] About 80% of ovarian tumors are benign and occur in young women between ages of 20 and 45 where as 20% are malignant tumors common in older women having poor prognosis.[2]

Risk factors are nulliparity, increasing age, positive family history, early menarche, late menopause, high socioeconomic status. Factors that decrease the risk are oral contraceptive pills, pregnancy, tubal ligation.[3] Early diagnosis of ovarian tumors is difficult due to its asymptomatic nature, inaccessible site and limited use of techniques like FNAC.[4]

The prognosis of ovarian neoplasms depends on tumor stage, specific histologic ype and grading.[5] The identification of different histological patterns is important in predicting tumor behaviour to decide further management of patients.

The aim of the study was to assess the incidence and histological pattern of ovarian tumors.

MATERIALS AND METHODS

This is a retrospective study carried out in the department of pathology at Chalmeda Anand Rao Institute of Medical Sciences, Karimnagar for a period of 2 years.

A total of 90 cases of ovarian mass specimen including solitary specimens and as a part of total abdominal hysterectomy specimens were studied. A detailed history, clinical examination and required laboratory investigations were obtained from the patients. The specimens were allowed to fix in 10% formalin and sections were given from representative areas and accompanying tissue. After tissue processing, paraffin blocks were prepared. These blocks were cut at 4-5 micrometer thick sections and stained with haematoxylin and eosin for histopathological examination.

In addition to H & E, special stains were done whenever necessary. The WHO classification of ovarian tumors was used for classifying the tumors.

RESULTS

In the present study, 90 cases of ovarian tumors were studied during the period of 2 years.

Incidence of various tumors of ovary

Out of 90 neoplastic cases, 58 cases were benign, 2 cases were borderline and 30 cases were malignant (Table 1).

Table 1: Incidence of various ovarian tumors

Nature of tumor	No.of cases (%)
Benign	58(64.5%)
Borderline	2 (2.2%)
Malignant	30 (33.3%)
Total	90(100%)

Age distribution among ovarian tumors

Age range from 15-80 years with majority of cases included among 41-50 years age group with 30 (33.3%) cases (Table 2).

Table 2: Age distribution among ovarian tumors

Age range	No. of cases (%)
11 -20	2 (2.2%)
21-30	8 (8.9%)
3 1-40	9 (10%)
41-50	30 (33.3%)
51-60	20 (22.2%)
61-70	15 (16.7%)
71-80	6 (6.7%)
Total	90 (100%)

Laterality of ovarian tumors

In the present study, majority of benign tumors were unilateral (86.2%) and only 13.8% of tumors were bilateral. Both of the borderline tumors were unilateral (100%). Among the malignant tumors, 25(83.3%) cases had unilateral tumors where as 5(16.7%) cases had bilateral tumors (Table 3).

Table 3: Laterality of ovarian tumors

Laterality	Benign (%)	Borderline (%)	Malignant (%)
Unilateral	50(86.2%)	2(100%)	25(83.3%)
Bilateral	8(13.8%)	0	5(16.7%)
Total	58(100%)	2(100%)	30(100%)

Consistency of ovarian tumors

On gross examination, majority of ovarian neoplasms (60 cases, 66.7%) were cystic. Solid were only 6 (6.7%), and both solid and cystic were 24 (26.6%) (Table 4).

Table 4: Consistency of ovarian neoplasms

Consistency	No. of Cases (%)
Cystic	60(66.7%)
Solid	6(6.7%)
Solid and cystic	24(26.6%)
Total	90(100%)

Histological types of ovarian neoplasms

In the present study, surface epithelial tumors were most common (87.8%) followed by germ cell tumors (8.9%). Sex cord stromal tumors comprised only 2.2% of all ovarian neoplasms. Only one case showed secondary deposits (1.1%) (Table 5).

Table 5: Histological types of ovarian neoplasms

Tumor type	No. of Cases (%)
Surface epithelial tumors	79 (87.8%)
Germ cell tumors	8 (8.9%)
Sex cord stromal tumors	2 (2.2%)
Metastatic tumors	1 (1.1%)
Total	90 (100%)

Distribution of cases according to the WHO classification

Among the surface epithelial tumors, serous cystadenomas were most common (32 cases; 35.6%). Borderline serous tumor comprised about 1.1% (1/90), papillary serous cystadenocarcinoma (Figure 1) about 23.4% (21/90), mucinous cystadenoma 21.1% (19/90),

mucinous borderline tumor 1.1% (1/90), mucinous cystadenocarcinoma (Figure 2) 3.3% (3/90), endometrioid tumor 1.1% (1/90), Brenner tumor 1.1% (1/90). Germ cell tumors comprised about 8.9% (8/90). Most of them were mature teratoma (Figure 3) with 6.7% (6/90), dysgerminoma 1.1% (1/90), yolk sac tumor 1.1% (1/90).

Sex cord stromal tumors comprised only 2.2% (2/90). One is fibroma (Figure 4) about (1.1%) and other is adult granulosa cell tumor (Figure 5) about (1.1%). Only one case showed metastatic tumor deposits (1.1%) (Table 6).

Table 6: Distribution of cases according to the WHO classification

Histological Subtypes	No. of cases (%)
Surface epithelial stromal tumors	79(87.8%)
Serous cystadenoma	32(35.6%)
Serous borderline tumor	1(1.1%)
Papillary serous cystadenocarcinoma	21(23.4%)
Mucinous cystadenoma	19(21.1%)
Mucinous borderline tumor	1(1.1%)
Mucinous adenocarcinoma	3(3.3%)
Endometrioid adenocarcinoma	1(1.1%)
Brenner tumour	1(1.1%)
Germ cell tumors	8(8.9%)
Mature teratoma	6 (6.7%)
Dysgerminoma	1(1.1%)
Yolk sac tumor	1(1.1%)
Sexcord stromal tumors	2(2.2%)
Fibroma	1(1.1%)
Adult granulosa cell tumor	1(1.1%)
Metastatic deposits	1(1.1%)
Total	90(100%)

DISCUSSION

Ovaries are paired pelvic organs that lie on either side of uterus close to lateral pelvic wall, behind the broad ligament and anterior to rectum. Ovary is subjected to monthly endocrine and traumatic insults during normal ovulatory cycles and becomes susceptible to tumorogenesis.

The complex anatomy of the ovary and its peculiar physiology with constant cyclical changes from puberty to menopause gives rise to number of cell types, each of which is capable of giving rise to tumors. Both the primary and secondary tumors of ovary are relatively frequent showing a variety of histopathological patterns.[6]

Depending on the type of the ovarian tissue where the neoplasm develops, ovarian tumors are classified into three primary classes: epithelial tumors, germ cell tumors and sexcord stromal tumors. These tumors exhibit wide spectrum of histogenesis, clinical behaviour, and histological types. It is not possible to diagnose the nature of tumor just by clinical and gross examination. Though they provide diagnostic clues, microscopic appearance of tumor is key for accurate typing of ovarian tumor. [7] Hence histopathological diagnosis remains the mainstay in achieving an optimal treatment response.[8]

A total of 90 cases were studied for a period of two years, out of which benign tumors comprised of 58(64.5%) cases, borderline tumors 2(2.2%) cases and malignant tumors 30(33.3%) cases.

The present study was in accordance with studies of Amita S Patel et al, [2] Priya Parmar et al,[9] Pachori et al,[10] Sawant A et al,[11] Singh S et al,[12] Thakkar N et al,[13] Badge A et al,[4] Bhavani, et al.[14] In the study of Gupta N et al, [5] borderline tumors (22.9%) are more compared to malignant tumors (4.2%).

Table 7- Comparison of incidence of ovarian tumors with other studies

Studies	Benign tumors	Borderline tumors	Malignant
Amita S Patel et al[2]	93.2%	0.6%	6.2%
Priya Parmar et al[9]	68.66%	2%	29.33%
Pachori et al[10]	72.31%	2.48%	25.21%
Sawant A et al[11]	75.7%	6.06%	18.2%
Singh S et al[12]	80.8%	1.6%	20%
Thakkar N et al[13]	84.5%	2.3%	13.2%
Badge A et al[4]	74%	5%	21%
Bhavani et al[14]	76%	10%	14%
Gupta N et al [5]	72.9%	22.9%	4.2%
Present study	64.5%	2.2%	33.3%

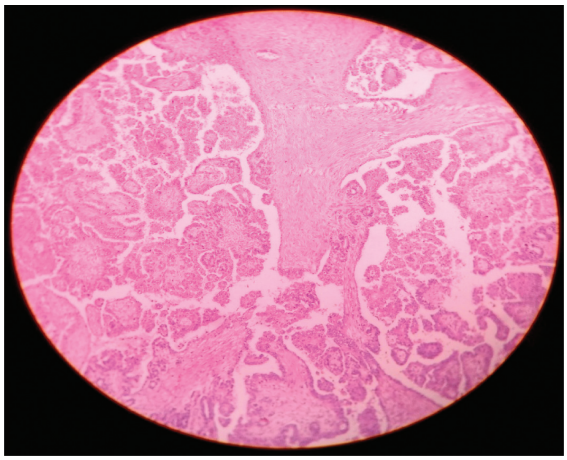

Figure 1: Papillary serous cystadenocarcinoma, 10X

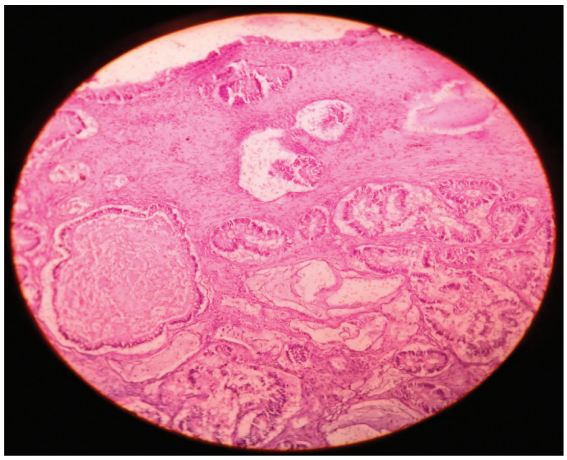

Figure 2: Mucionus cystadenocarcinoma, 10X

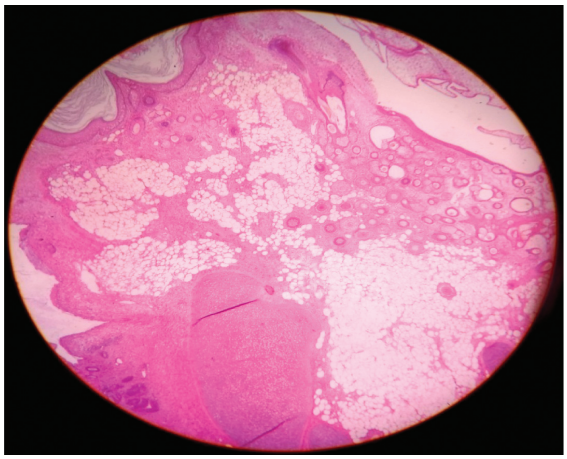

Figure 3: Mature teratoma, 10X

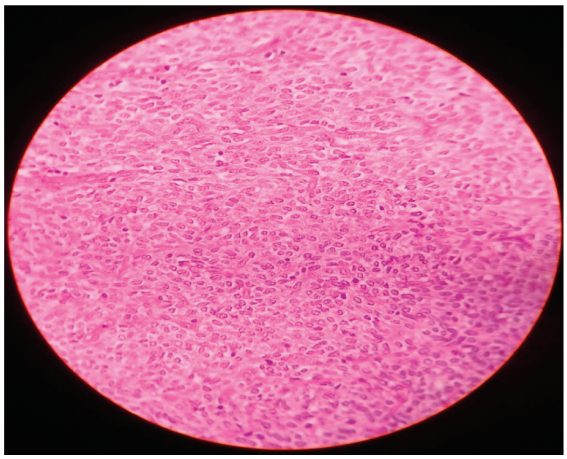

Figure 4: Fibroma, 40X

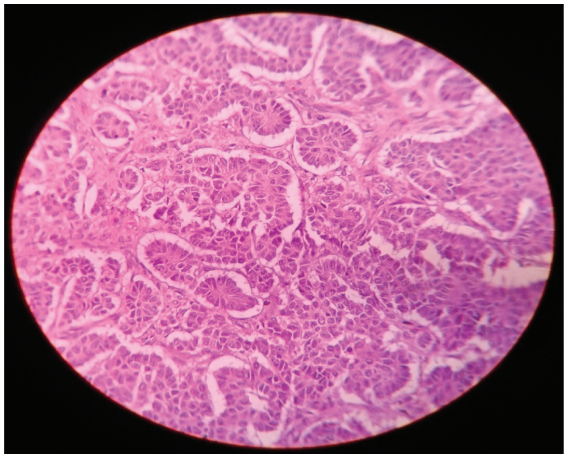

Figure 5: Adult granulosa cell tumor, 40X

In our study, maximum number of patients were from age group of 41-50 years (33.3%). Amita S et al,[2] Kancherla et al,[15] Jha et al [16] showed majority of ovarian tumors among 31-40 years of age. Ovarian tumors were unilateral in 85.6% of cases and bilateral in 14.4% of cases which is correlated with the studies of Amita S Patel et al,[2] Thakkar N et al,[13] Prakash A et al.[17]

Table 8: Comparison of laterality of avarian tumors with other studies

Studies	Unilateral	Bilateral
Amita S Patel et al[2]	89.5%	10.5%
Thakkar N et al[13]	88.4%	11.6%
Prakash A et al[17]	90.8%	9.2%
Present study	85.6%	14.4%

Table 9: Comparison of histological types of ovarian neoplasms

Studies	Surface epithelial tumors	Germ cell tumor	Sex cord stromal tumor	Metastatic deposits
Pachori et al[10]	65.2%	23.9%	7.4%	3.3%
Swamy and Satyanarayana[18]	61.6%	21.7%	11.7%	5%
Gupta N et al[5]	65.6%	23.9%	8.3%	-
Pilli et al[19]	71%	21%	7%	-
Santhosh et al[20]	67.9%	23.1	5.6%	3.2%
Priya Parmar et al[9]	62%	24.67%	9.33%	4%
Present study	87.8%	8.9%	2.2%	1.1%

On gross examination, in the present study among 90 cases, cystic 66.7%(60/90), solid 6.7%(6/90), and both cystic and solid areas 26.6%(24/90).

In the present study, surface epithelial tumors were most common (87.8%) followed by germ cell tumors (8.9%), sex cord stromal tumors (2.2%), secondaries (1.1%). These findings are similar to the Pachoriet al,[10] Swamy and Satyanarayana,[18] Gupta et al,[5] Pilli et al,[19] Santhoshet al,[20] Priya Parmar et al.[9]

CONCLUSION

The ovarian neoplasms exhibit a wide spectrum of clinical and pathological features. The histopathological examination is the gold standard in the diagnosis of ovarian tumors and also in predicting the prognosis. It may be supplemented by the newer techniques like immunohistochemistry, flow cytometric analysis of ploidy status to resolve difficult cases. This study concludes that surface epithelial tumors were most common followed by germ cell tumors and majority of ovarian tumors were reported in the age group of 41-50 years.

CONFLICT OF INTEREST:

The authors declared no conflict of interest.

FUNDING: None

REFERENCES

1. Kurman RJ. Blaustein's Pathology of the female Genital Tract. Seventh edition. New York. Springer, Verlag; 2019.
2. Amita S Patel, Jignasha M Patel, Kamlesh J Shah. Ovarian tumors: Incidence and histopathological spectrum in tertiary care center, Valsad. *IAIM.* 2018; 5(2):84-93.
3. Ellenson LH, Piorg EC. The Female Genital Tract. Kumar V, Abbas AK, Aster JC. Eds; Robbins and Cotran Pathologic basis of disease, Professional Edition, 9th edition, Elsevier Saunders, Philadelphia, 2010:1005-1063.
4. Badge SA, Gosavi AV, Sulhyan KR. Histopathological study of ovarian tumors. *Indian Medical Gazette.* 2013; 345-351.
5. Gupta N, Yadav M, Gupta V, Chaudary D, Patne SC. Distribution of various histopathological types of ovarian tumors: A study of 212 cases from a tertiary care center of Eastern Uttar Pradesh. *J Lab Physicians.* 2019; 11:75-81.
6. Rosai J. Female reproductive system- Ovary. In: Rosai and Ackerman's Surgical Pathology. 11th edition. Missouri: Elsevier: 2017.
7. Agrawal P, Kulkarni DG, Cahkrabarti PR, et al. Clinico pathological Spectrum of Ovarian Tumors: A 5 Year Experience in a Tertiary Health Care Center. *J Basic Clin Reproduct Sci.* 2015; 4(2):90-96.
8. Mansoor NA et al. Spectrum of ovarian tumors: Histopathological study of 218 cases. *Gulf J Oncol.* 2015.
9. Priya Parmar, Sangita Sehgal, Kusum Mathur, Ajay Yadav. Histopathological Study of Ovarian Tumors in Tertiary Care Center. *Int J Med Res Prof.* 2017; 3(2):96-98.
10. Pachori G, Meena US, Sunaria RK, Pachori P, Jethani N, Bayla T et al. Histopathological study of ovarian tumors in Ajmer region. *Int J Med Sci Public Health.* 2016; 5(7):1400-3.
11. Sawant A, Mahajan S. Histopathological Study of Ovarian Lesions at a Tertiary Health Care Institute. *MVP J Med Sci.* 2017; 4(1):26-29.
12. Singh S, Saxena V, Khatri SL, Gupta S, Garewal J, Dubey K. et al. Histopathological evaluation of ovarian tumors. *Imperial J Interdisciplinary Res.* 2016; 2(4):435-439.
13. Thakkar N, Shah S. Histopathological Study of Ovarian Lesions. *Int J Sci Res.* 2015; 4(10):1745-9.
14. Muni Bhavani I, Satyanarayana V. Study of Histopathological spectrum of ovarian neoplasms: An experience at a tertiary care hospital. *Int J Clin Diagn Pathol.* 2019; 2(2):408-413.
15. Kancherla J, Kalahasti R, Sekhar KPAC, Yarlagadda SB, Devi SP. Histomorphological Study of Ovarian Tumors: An Institutional Experience of 2 Years. *Int J Sci Study.* 2017; 5(3):232-235.
16. Jha R, Karki S. Histological pattern of ovarian tumors and their age distribution. *Nepal Med Coll J.* 2008; 10:81-5.
17. Prakash A, Chinthakindi S, Duraiswami R, Indira.V. Histopathological study of ovarian lesions in a tertiary care center in Hyderabad, India-a retrospective five-year study. *Int J Adv Med.* 2017; 4:745-9.
18. Swamy GG, Saryanarayan N. Clinico pathological analysis of ovarian tumors: A study on five years samples. Nepal Med Coll J. 2010; 12(4):221-223.
19. Pilli G, Sunita KP, Dhaded AV. Ovarian tumours: A study of 282 cases. *J Indian Med Assoc.* 2002; 100(7):1-6.
20. Mondal SK, Banyopadhyay R, Nag DR, Roychowdhury S, Mondal PK, Sinha SK. Histologic pattern, bilaterality and clinical evaluation of 957 ovarian neoplasms: A 10-year study in a tertiary hospital of eastern India. *J Can Res Ther.* 2011; 7(4):433-7.