Histopathological diagnosis and comparative incidence of Ovarian tumors: Retrospective and prospective study.

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Abstract:

Background: Ovarian tumors are one of the commonest neoplasms of female and they cause remarkable morbidity and mortality in all age groups. **Aims:** Histopathological diagnosis, to know the comparative incidence of ovarian tumors in various age groups. **Materials and Methods:** All specimens of ovarian tumors received to the Department of pathology, P. D. U. Medical College and hospital- Rajkot during October 2010 to September 2015 were included in this study. The specimens were fixed in 10% formal saline, processed and paraffin blocks were prepared, sections of 5 um thicknesses were cut and stained with haematoxylin and eosin stain. **Results:** Total 115 cases of ovarian tumors were received. Out of the 115 cases, 93 were benign, 4 were borderline and 18 were malignant. On further histological typing, commonest were surface epithelial tumors 61 cases (53.04%), followed by germ cell tumors 42 cases (36.5%), sex-cord stromal tumors 11 cases (9.56%) and Metastatic tumors 01 case (0.86 %). **Conclusion:** Ovarian tumors are comparatively common clinical entity requiring surgical intervention. Benign ovarian tumors are commoner than malignant tumors and malignant tumors are seen in later age group than benign. Majority of ovarian tumors were seen between 21-30 years of age group. Exact histopathological diagnosis is very important for post-operative management of patient whenever indicated.

Keywords: Benign, Histopathology, Ovarian tumor.

Introduction:

Ovary is an important organ as it is concerned with the reproduction of progeny.

Worldwide, ovarian cancer is the sixth most common cancer in women.[1] Incidence rate of tumors of ovary is equal to the tumors of corpus uteri and cervix in advanced country and constitutes 30% of all cancers of female genital system.[2]

The lifetime risk of ovarian cancer in women with no family history is 1.6% with one affected first degree relative is 5% [2]& 7% with two or more affected first degree relatives.[3]

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Ovarian tumors are one of the commonest neoplasms of females and commonly received surgical pathology specimens. They cause

remarkable morbidity and mortality in all age groups of patient. Thus, there are wide varieties of histopathological diagnosis of ovarian tumors, ranging from completely benign to highly malignant ones and a group with intermediate malignant potential also.

They commonly present with abdominal pain, a lump or menstrual irregularities.[4]

Materials and Methods:

Ethical Clearance: Consents were taken before surgery at respective department.

All specimens of ovarian tumours that were received to the histopathology section, Department of pathology, P. D. U. Medical College and hospital- Rajkot during October 2010 to September 2015 were included in this study.

The specimens were fixed in 10% formal saline, subsequently dehydration, clearing and embedding in paraffin wax carried out. Blocks were made and sections of 5 um thicknesses were cut and stained with haematoxylin and eosin stain.

Result:

Out of 115 cases of ovarian tumors; 93 were benign, 4 were borderline tumors and 18 were malignant tumors.

Table 1: Age group distribution of benign, borderline & malignant ovarian tumor

Age (yrs.)	Benign		Borderline		Malignant	
	No. of Cases	%	No. of Cases	%	No. of Cases	%
<10	1	1.1	-	-	1	5.6
11-20	6	6.4	-	-	1	5.6
21-30	32	34.4	1	25	4	22.2
31-40	16	17.3	-	-	4	22.2
41-50	19	20.4	1	25	5	27.7
51-60	10	10.7	1	25	1	5.6
>61	9	9.7	1	25	2	11.1
Total	93	100.0	4	100.0	18	100.0

Graph 1: Age wise distribution according to histopathological type of ovarian tumor
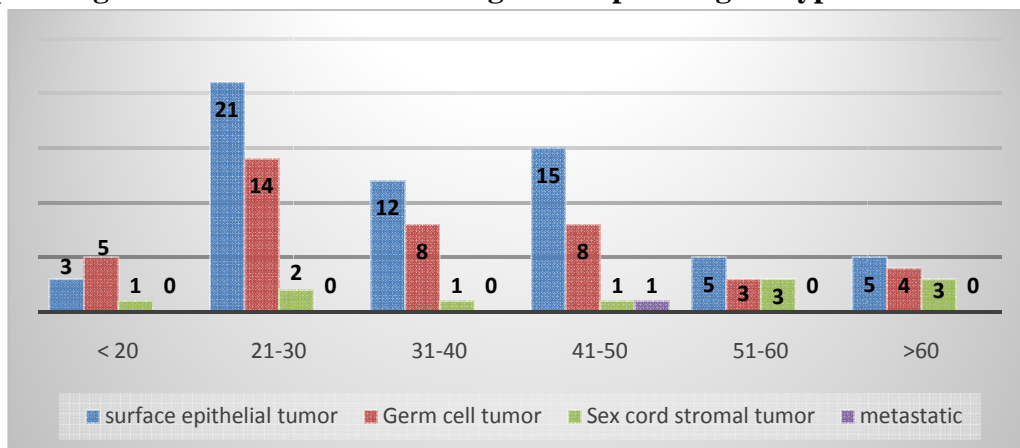
The cases had a wide range of age distribution and found to occur in age group of patients ranging from 1st and 8th decade. Youngest patient seen was 5 years and oldest 80 years, peak incidence occurring between 21 to 30 years of age group. Highest cases of benign ovarian tumors were found in 21-30years of age group. The carcinomas were found to occur at a later age group (41-50 years) than benign tumors (21-30 years). Borderline tumor was not found before 20 year of age. Out of 61 cases of surface epithelial tumor, highest numbers of cases were found 21-30 years of age group. For Germ cell tumor, highest were found 21-30 years of age group. Sex cord stromal tumors and metastatic tumor were seen somewhat later in age group

Most of cases were unilateral; only 6 cases out of 115 were bilateral. Unilateral tumors were more common than bilateral tumor.

Table 2: Histological classification of Ovarian Tumour

|	Type of ovarian tumor	No. of cases	Percentage
I.	**Surface epithelial tumors**	**61**	**53.04**
	A. Serous tumors		
	Benign	29	25.21
	Borderline	01	0.86
	Malignant	05	4.34
	Cystadenofibroma	03	2.60
	B. Mucinous tumors		
	Benign	14	18.40
	Borderline	03	1.20
	Malignant	03	1.20
	C. Clear cell carcinoma	01	0.86
	D. Brenner tumor	01	0.86
	E. Malignant mixed Muellerium tumor	01	0.86
II.	**Sex-cord stromal tumor**	**11**	**9.56**
	Granulosa cell tumor	05	4.34
	Fibroma-thecoma	05	4.34
	Sclerosing stromal tumor	01	0.86
III.	**Germ cell tumors**	**42**	**36.50**
	Dysgerminoma	01	0.86
	Mixed germ cell tumor	01	0.86
	Teratoma	40	34.70
IV	**Metastatic tumor**	**01**	**0.86**
	Krukenberg tumor	01	0.86
	Total	**115**	**100**

Majority of the ovarian tumors measured between 6-10 cm in size. A mucinous cystadenocarcinoma measuring 27x18x10 cm (weighing around 10 kg) was the largest ovarian tumor encountered in this study.

The surface epithelial tumors were the commonest tumors accounting for 61 cases (53.4%), germ cell tumors are 42 cases (36.5%) and sex cord stromal tumors formed 11 cases (9.56%).
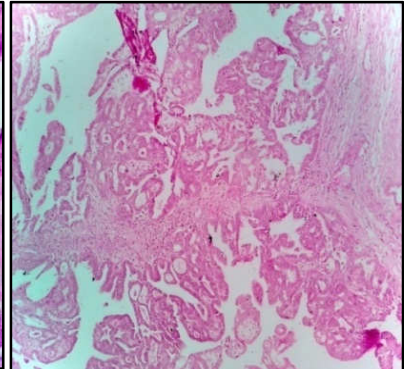
Image 1 Papillary serous cystadenofibroma [H&E 10X]
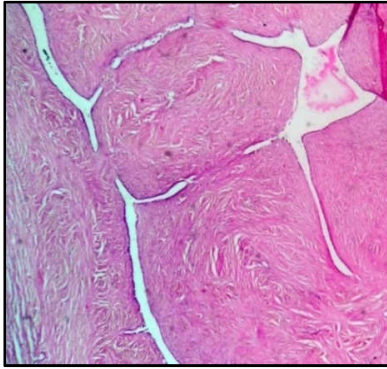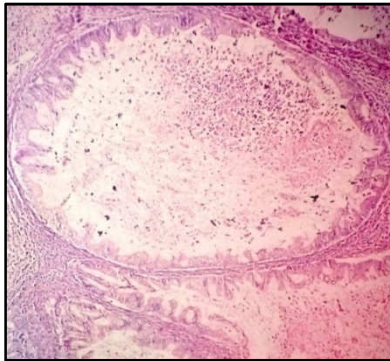

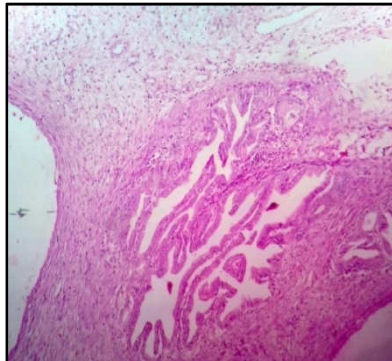
Image 2 Papillary serous cystadenofibroma [H&E 40X]
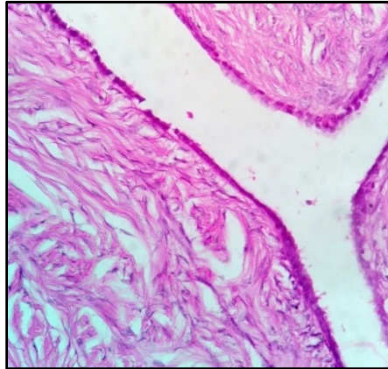
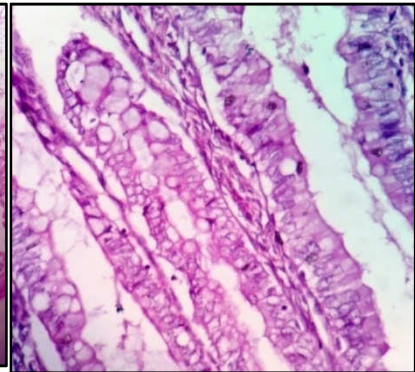**Image 3 Papillary serous cystadenocarcinoma [H&E 4X]**
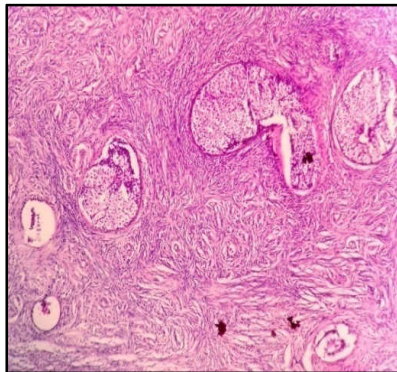

Image 4 Mucinous cystadenoma [H&E 10X]
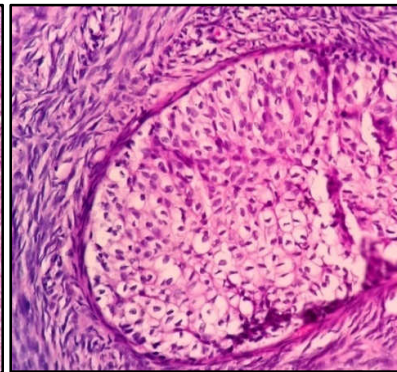

Image 5 Mucinous cystadenocarcima [H&E 10X]

Image 6 Mucinous cystadenocarcima [H&E 40X]
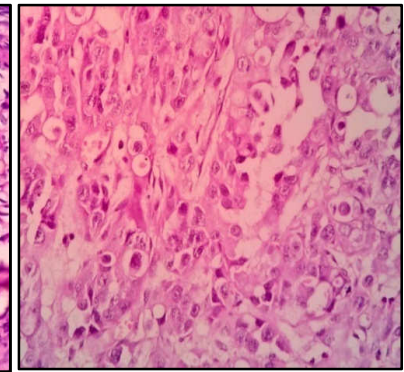

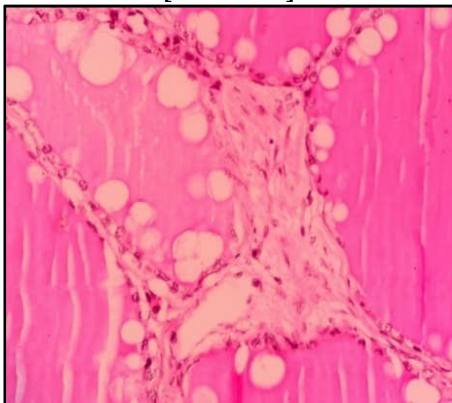**Image 7 Brenner tumor of Ovary [H&E 10X]**

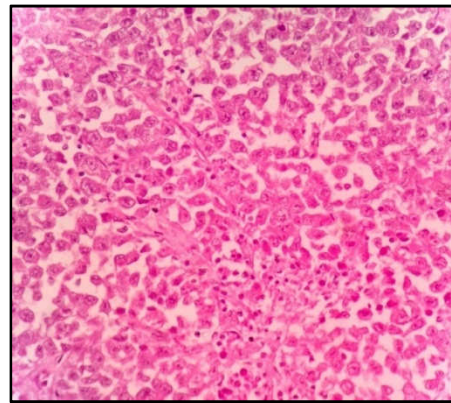**Image 8 Brenner tumor of Ovary [H&E 40X]**

Image 9 Clear cell Carcinoma of Ovary [H&E 40X]

Image 10 Clear cell Carcinoma of Ovary [H&E 40X]

Image 11 Dysgerminoma of ovary [H&E 10X]

Papillary serous cystadenofibroma showing multiple blunt papillae lined by cuboidal epithelium, fibroblastic stromal component is unduly prominent (Image 1,2); while cystadenocarcinoma shows complex papilla.(Image 3) Mucinous cystadenoma shows lining of columnar cells with mucin (Image 4), while in Mucinous cystadenocarcinoma complex architecture, stratification and obvious nuclear atypia and stromal invasion by tumor cells were found. (Image 5,6) Brenner tumor of ovary shows solid and cystic epithelial cells embedded within fibrous tissue. The epithelial nests of Brenner tumor are composed of cells that have sharply defined outlines with oval nuclei.(Image 7,8) In Clear cell Carcinoma of Ovary, tumor cells with clear cytoplasm with nuclear atypia seen. (Image 9) In Struma ovarii: Benign thyroid follicle found within ovarian stroma. (Image 10) Dysgerminoma of ovary showing well defined nests of tumour cells separated by fibrous strands, which is infiltrated by lymphocytes and plasma cells. (Image 11) Call-Exner bodies seen, Coffee-bean nuclei in adult type of ovarian granulosa cell tumor. (Image 12.A, 12.B, 12.C) Fibroma-thecoma of ovary shows spindle cells arranged in intersecting bundles. (Image 13) In Krukenberg tumor of ovary: Numerous signet ring cells are present in a highly fibrous stroma. (Image 14)

Image 12 Ovarian granulose cell tumor- Adult type [H&E]
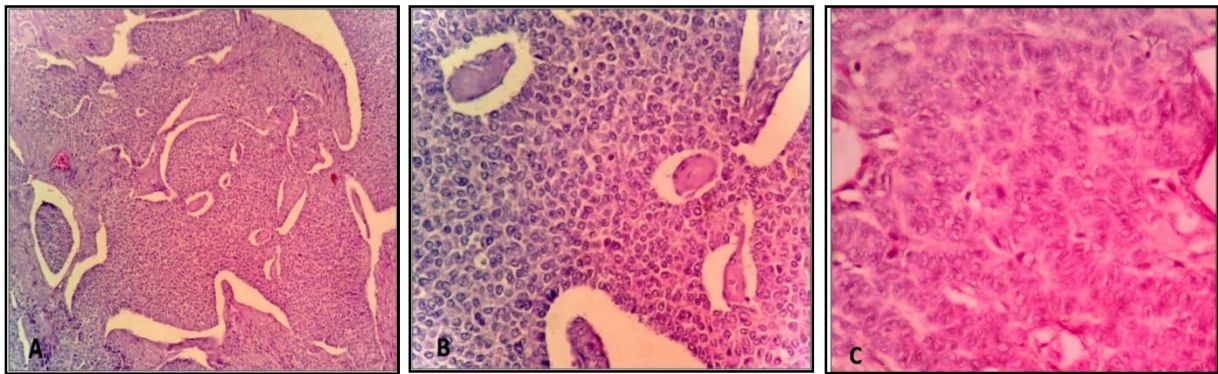**(12. A - 4X), (12.B – 10X) (12.C – 40X)**

Image 13 Fibroma-thecoma of ovary
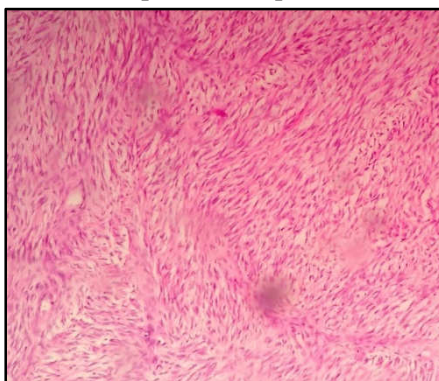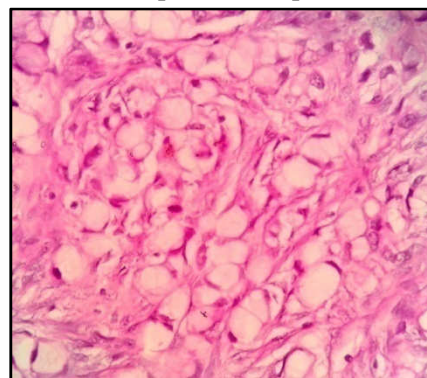**[H&E 10X]**

Image 14 Krukenberg tumor of ovary
[H&E 40X]

Discussion:

Total of 115 cases of ovarian tumors were studied in the department of Pathology, P.D.U. Medical College and hospital- Rajkot over a period of 5 years.

Tumors were studied in relation to age distribution, pattern and Pathological features

and were classified according to modified WHO Histological classification of ovarian tumors (2013)

Table 3 Comparison of Percentage distribution of cases in various age groups

Sr. No.	Authors	Age (Group) in years							
		< 10	11-20	21-30	31-40	41-50	51-60	61-70	> 70
1	H. Makwana et al[5]	0.3	4.4	39.4	31.1	14.4	9.2	0.9	-
2	Ameena Ashraf et al[6]	0.4	12.7	30.1	22.6	18.4	10.3	3.7	1.4
3	Saxena et al[7]	10.6		31.1	27.5	20.2	6.7	3.6	
4	R Jha & S karki[8]	6.8		20.5	26.7	21.1	14.3	10.6	-
5	Present study	1.7	6.08	32.1	18.2	21.7	9.5	10.4	-

Table 4 Comparison of distribution of different Histological types of ovarian tumors

Type of ovarian tumor	S.A. Badge et al[10] (2008)	R Jha & S karki[8] (2008)	H.Makwana et al[5] (2014)	Kanthikar S. N. et al[11] (2014)	M.Uma Devi et al[9] (2015)	Present study
Surface epithelial tumors						
Serous tumors						
Benign	31	27.3	35	39.9	40	25.2
Borderline	2	-	2.8	1.4	-	0.9
Malignant	10	7.4	7.8	8.6	8.3	4.3
Cystadenofibroma	2	0.6	-	-	-	2.6
Mucinous tumors						
Benign	23	13.0	9.2	11.4	20	12.1
Borderline	1	-	0.7	-	-	2.6
Malignant	2	3.7	3.5	4.3	6.7	2.6
Endometroid tumor	1	-	2.8	1.4	0.3	-
Clear cell carcinoma	3	-	1.4	-	-	0.9
Brenner tumor	1	-	2.1	-	-	0.9
Malignant mixed Muellerium tumor	1	-	-	-	-	0.9
Sex-cord stromal tumor						
Granulosa cell tumor	2	0.6	7.8	1.4	0.8	4.3
Fibroma-thecoma	4	2.5	1.4	4.3	0.8	4.3
Sertoli leydig cell tumor	-	-	-	-	0.8	-
Sclerosing stromal tumor	-	-	-	-	-	0.9
Germ cell tumors						
Dysgerminoma	3	-	0.7	2.9	1.7	0.9
Yolk sac tumor	-	0.6	0.7	-	0.8	-
Embryonal tumor	-	-	-	-	0.8	-
Mixed germ cell tumor	-	-	-	-	-	0.9
Teratoma						
Mature cystic	12	40.4	18.5	18.6	15	33.0
Immature	-	1.2	-	-	-	-
Struma ovarii	1	-	2.8	1.4	0.8	1.7
Metastatic tumor	1	2.4	2.1	4.2	1.7	0.9

No age group was exempted from the occurrence of ovarian tumors including childhood. The majority of the tumors occurred in the 21-30 years age group in the present study, which is comparable with other study, except in R Jha & S Karki study in which majority of the tumor occurred in 31-40 years. [8]

Based on histomorphological features, incidence of surface epithelial tumours were commonest (53.04%) followed by germ cell tumours (36.5%), sex cord (9.56%) and metastatic (0.9%). Similar observations were seen in other study. The commonest epithelial tumors were serous and mucinous cystadenoma and the commonest germ cell tumor was benign cystic teratoma (40 cases) in the present study. Similar observations were made by other study.

Conclusion:

Total 115 cases of ovarian tumors noted during 5 years of this study. Majority were benign followed by malignant then borderline. Majority of benign tumors were seen 21-30 years of age group and malignant tumors were seen in later age group. Majority cases were surface epithelial tumors followed by germ cell tumors then sex cord stromal tumors and metastatic. So, ovarian tumors are comparatively common clinical entity requiring surgical intervention. Correct histopathological diagnosis of ovarian tumors is of prime importance in view of their behaviour prediction and also for proper management of patient.

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