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An Institution-based study on Cystic Lesions of Ovary in the Konkan belt of Maharashtra State, India

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Abstract :Background: *The aims of this study were: 1.) To find out the overall incidence of ovarian cysts in our hospital. 2.) To analyze age incidence of various ovarian cysts studied. 3.)To evaluate various clinical presentation of ovarian cysts. 4.)To find out the incidence of non-neoplastic as well as neoplastic cysts and furthermore incidence of benign and malignant ovarian cysts. 5.)To study the clinico-pathological significance.*
Methods: *158patients were included in study over a period of three years from August 2014 to July 2017. All the patients with cystic lesions of ovary based on biopsies alone, on resected specimens alone and both consequently were examined and included in the study. All the biopsies specimen and resected specimen were fixed in 10% formalin and processed in automatic tissue processor. Routine Haematoxylin and Eosin staining was done and examined under light microscope. All the data was analyzed with respect to age-wise, sex-wise, site-wise distribution along with incidence of various cystic lesion of ovary studied in all 158 cases. All patients in whom both biopsy and final specimen were resected, histopathological correlation was done in them.*
Results: *Patients in the age group of 41 – 50 years were having maximum number of cystic lesion of ovary in the present study. High adequacy of samples for histopathological examination of cystic lesion of ovary was seen in the present study. Overall, benign lesions were higher in incidence than malignant cystic lesions amongst neoplasticovarian cysts.Menstrual disturbances followed closely by lower abdominal pain were the most commom complaints. Follicular cyst was most commonly diagnosed closely followed by serous cystadenoma.Pain was the main presenting symptom in cases of serous cystic tumors and dermoid cysts whereas mucinous cysts presented mainly with lump in abdomen. Pre-operative guided biopsy helps in prompt management and subsequent better survival, especially in malignancy cases.*
Conclusion: *Most women of reproductive age group develop small cysts each month, and large cysts that cause problems that occur in about 8% of women before menopause. Overall benign lesions were higher in incidence than malignant cystic lesions among neoplastic ovarian cysts.Malignant serous tumor of ovary was the most common malignant ovarian cystic tumor. Pre-operative guided biopsy helps in prompt management and subsequent better survival, especially in malignancy cases. Biopsy findings are subsequently well-correlated with histopathology findings of final resected specimens. This signifies the importance of pre-operative biopsy based diagnosis in patients with problematic ovarian cysts.*

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I. Introduction

The Ovaries are anatomically paired primary sex organs of human female.Anatomically they are located in the posterior leaf of the broad ligament in close proximity to the fallopian tubes on either sides of the uterus.[1,2]

Ovarian cysts are the commonest occurring at all ages of life and routinely encountered by surgeons in clinical practice.[3,4]Clinically, ovarian cysts are important because the distinction between Non-neoplastic cystic lesions is difficult on clinical grounds. Furthermore the USG of ovary does not obviate the role of pathologist.[5]

The role of histopathology is a must in deciding the neoplastic nature and potential malignant behavior of such cysts.

The total surgical specimen received by our pathological department from **1st August 2014 to 31st July 2017** was **7748. 2.03%** of these cases were having **ovarian cysts.**

II. Material and Methods

With approval of Ethics Committee and consent of patients, the study was conducted at our tertiary hospital in Konkan region, Maharashtra state. It was a retrospective, cross sectional study over a period of *three years from August 2014 to July 2017*. All-together, 158 patients were included in study with total 170 ovarian cysts. All the biopsies specimens and resected specimens were fixed in 10% formalin and processed in automatic tissue processor. Routine Haematoxylin and Eosin staining was done and examined under light microscope. All the data was analyzed with respect to age-wise, site-wise distribution along with incidence of various cystic lesion of ovary studied in all 158 cases. All patients in whom biopsy and specimen were resected, histopathological correlation was done in those patients, wherever possible.

III. Results

Patients in the age group of 41-50 years were having maximum number of cystic lesions of ovary in the present study.Follicular cyst was most commonly diagnosed closely followed by serous cystadenoma. Surface epithelial malignancy - cases were seen after age of 50 years.

Non-neoplastic cysts were more commonly than neoplastic ovarian cysts. Serous cystadenoma was the most common cystic neoplasm of ovary.In neoplastic surface epithelial tumor, the most common benign neoplastic ovarian cystic lesion was serous cystadenoma, whereas serous cystadenocarcinoma was commonest malignant ovarian cystic neoplasm.In non-neoplastic variety, follicular cysts were the most with 20.59% of overall cases.

The youngest patient was 16 year-old child with Serous cystadenoma whereas the oldest patient was 85-year female with diagnosis of serous cystadenocarcinoma.

Menstrual disturbances followed closely by lower abdominal pain were the most common complaint.

The non-neoplastic cyst presented mainly with menstrual disturbances.Pain was the main presenting symptom in cases of serous cystic tumors and dermoid cysts whereas mucinous cysts presented mainly with lump in abdomen.

Total patients studied : 158 cases, Total cysts studied: 170.Cases of unilateral ovarian cystic lesion were seen in 112 patients in the present study, whereas 46 patients showed bilateral ovarian cystic lesions.Overall, benign lesions were higher in incidence than malignant cystic lesions amongst neoplastic ovarian cysts.

49 cases were overall cystic serousneoplasm, 67 cases were of neoplastic cysts, 61 cases were cystic surface epithelial tumors among ovarian cysts and 170 were total ovarian cysts.

Benign serous tumor was common tumor followed by malignant serous tumor of ovary without any single diagnosed case of Borderline serous tumor. Malignant serous tumor of ovary was the most common malignant ovarian cystic tumor.

Benign mucinous tumor was common followed by malignant and borderline mucinous cystic tumors of ovary.

In the present study, the predominant ectodermal derivatives followed by mesodermal and endodermal derivatives were common findings in mature cystic ovarianteratomas(dermoid cysts).

USG studies : Out of 158 cases, USG studies were conducted in 105 cases.Serosal inclusion cysts, follicular cysts, luteal cysts and chocolate cysts were predominantly completely cystic. Even majority of the serous cystadenomas were completely cystic on USG. The mucinous cystadenomas, serous cystadenomas showed cystic ovarian lesion with internal septation. Majority of the dermoid cysts showed cystic swelling with layering of internal material. Dermoid cyst containing fat and cystic fluid showed dense hypoechoic areas and which were showing areas of calcification and bone showed hyperechoic areas with shadowing.Serous cystadenocarcinoma cases showed majority complex cysts on USG.

Biopsy findings are often subsequently well correlated with histopathology findings of final resected specimen. Pre-operative guided biopsy helps in prompt management and subsequent better survival, especially in malignancy cases.

Out of 158 cases and 170 cysts, 18 were malignant ovarian cysts. Pre-operative biopsy was available in 15 of these 18 cases. 11 of those 15 cases show associated finding of serous cystadenocarcinoma on pre-operative biopsy. These findings were confirmed on final histopathology report of the operated hysterectomy specimen.

IV. Discussion

Total number of cases :158
Total ovarian cystsin above cases: 170

Table No.1 shows types of specimen received for histopathological examination, year-wise

Types of Specimen	Aug.2014-July2015	Aug.2015-July2016	Aug.2016-July2017	TOTAL
Total abdominal hysterectomy with bilateral salpingo-oophorectomy	15	15	40	70
Total abdominal hysterectomy with unilateral salpingo-oophorectomy	6	6	8	20
Ovarian cystectomy	5	5	15	25
Oophorectomy	3	5	17	25
Salpingo-oophorectomy	4	4	7	15
Ovarian biopsy	**1**	**1**	**1**	**3**
TOTAL	**34**	**36**	**88**	**158**

Table No. 2: Age incidence: Ovarian cysts

Age range	Number of cases	Percentage
0 -10	0	0.0
11 -20	04	2.53
21 – 30	13	8.22
31 – 40	40	25.31
41 – 50	73	46.20
51 – 60	14	8.86
61 – 70	9	5.71
71 – 80	4	2.54
Above 81	1	0.63
TOTAL→	**158**	**100**

The total surgical specimen received by our pathological department from **1st August 2014 to 31st July 2017** was **7748. 2.03% of these cases were having ovarian cysts.**

Table No. 2 shows the age incidence of Ovarian cysts in our study. Maximum number of cases of ovarian cysts were seen in the fifth decade of life (41 – 50 years) followed by those in fourth decade of life. The youngest patient was 16 year-old child with serous cystadenoma whereas the oldest patient was 85-year female with diagnosis of serous cystadenocarcinoma.

Table Nos.3and 4 shows the age incidence, number of ovarian cysts with histopathology diagnosis.

Table No. 3: Age incidence, number of ovarian cysts with histopathology diagnosis

Histological Type	No. of cases	0 - 10	11 - 20	21 - 30	31 - 40	41 - 50	51 - 60	61 - 70	71 - 80	Above 81
Serosal inclusion cyst	31			01	08	15	01	01	03	
Follicular cyst	35		01		12	21	01			
Corpus luteal cyst	30		01	02	12	14	01	01		
Chocolate cyst	04			03		01				
Serous cystadenoma	34		02	02	06	17	05	02		
Borderline serous tumor	00									
Serous cystadenocarcinoma	15				02	05	03	04		01
Mucinous cystadenoma	08				03	02	02	01		
Borderline mucinous tumor	01			01						
Mucinous cystadenocarcinoma	02				01		01			
Granulosa cell tumor	01					01				
Dermoid cyst	05			02	02	01				
Twisted ovarian cyst	02			01		01				
Borderline Brenner tumor	01				01					
Mullerian cyst	01			01						
TOTAL	**170**	**0**	**3**	**13**	**47**	**77**	**14**	**09**	**3**	**1**

Total patients were 158 cases, Total no. of cysts :- 170.Maximum number of cases for most of the individual ovarian tumors was in the age group of 31-50 years. Dermoid cyst of ovary was seen mostly in early decades of life. Surface epithelial carcinoma cases were seen after age 50 years.

Table No.4: Average age with respect to corresponding histological type of ovarian cyst

Histological Type	No. of cases	Average age in yrs
Serosal inclusion cyst	31	43.06
Follicular cyst	35	42.42
Corpus luteal cyst	30	41.66
Chocolate cyst	04	29
Serous cystadenoma	34	44.35
Borderline serous tumor	00	00
Serous cystadenocarcinoma	15	55.06
Mucinous cystadenoma	08	45.25
Borderline mucinous tumor	01	26
Mucinous cystadenocarcinoma	02	44.5
Granulosa cell tumor	01	45
Dermoid cyst	05	34
Twisted ovarian cyst (non-neoplastic)	02	50.5
Borderline Brenner tumor	01	39
Mullerian cyst	01	30
TOTAL	**170**	

Table No. 5 : Presenting symptoms of ovarian cystic lesions			
Presenting symptoms	**Abbreviations**	**No.of cysts**	**Percentage**
Menstrual disturbances	**M**	52	30.58
Pain in abdomen	**P**	50	29.41
Lump in abdomen	**L**	11	6.47
Infertility	**I**	5	2.94
Menstrual disturbances and Pain in abdomen	**M+P**	22	12.94
Menstrual disturbances and lump in abdomen	**M+L**	1	0.58
Pain and lump in abdomen	**P+L**	11	6.47
Menstrual disturbance and pain and lump in abdomen	**M+P+L**	12	7.05
No symptoms	**NO**	2	1.19
Other symptoms	**O**	4	2.37
Total		170	100

Table No. 5 shows menstrual disturbances included menorrhagia, irregular bleeding PV, dysmenorrhea and amenorrhea. Menorrhagia was the commonest menstrual disturbances.
Menstrual disturbances followed closely by lower abdominal pain were the most common complaint.
Non-neoplastic cysts comprised about 60.59% of cases whereas neoplastic cysts comprised 39.41% of the cases.The following Table No. 6show that the commonest **neoplastic** ovarian cystic lesion was serous cystadenoma comprising about 20% of overall ovarian cystic lesions followed by serous cystadenocarcinoma (8.8% cases) and mucinous cystadenoma (4.7% cases). Among the **non-neoplastic variety**, follicular cysts were

Table No. 6 : Incidence of ovarian cystic lesions-Neoplastic vs Non-neoplastic				
Group		**Type**	**No.of cysts**	**Percentage**
Non-neoplastic cysts		Serosal inclusion cyst	31	18.23
		Follicular cyst	35	20.59
		Luteal cyst	30	17.64
		Chocolate cyst	4	2.35
		Twisted ovarian cyst	2	1.17
		Mullerian cyst	1	0.58
Neoplastic cysts	**Surface epithelial tumor (SET)**	Serous cystadenoma	34	20
		Borderline serous tumor	0	0
		Serous cystadenocarcinoma	15	8.8
		Mucinous cystadenoma	8	4.70
		Borderline mucinous tumor	01	0.58
		Mucinous cystadenocarcinoma	02	1.17
		Borderline Brenner tumor	01	0.58
	Sex cord stromal tumor	Granulosa cell tumor	01	0.58
	Germ cell tumor	Mature cystic teratoma: Dermoid cyst	05	2.94
Total			**170**	**100**

maximum with 20.59% of overall cases.

The following Table No. 7 : Total patients in the study were 158 cases. Out of 158 cases, 112 cases showed UNILATERAL ovarian cystic lesion with maximum 23 cases each of serous cystadenoma (20.53%) and luteal cyst (20.53%).
Unilateral luteal cyst was seen more in right ovary than left ovary. Diagnosis of unilateral follicular cyst was seen more in left ovary than right ovary. Predilection of dermoidcyst : ovary was more on left side than right ovary.

Table No. 7 : Laterality of 112 UNILATERAL ovarian cystic lesions			
Histological type	**Left ovary**	**Right ovary**	**Total cases with single cyst**
Serosal inclusion cyst	10	10	20
Follicular cyst	16	04	20
Luteal cyst	7	16	23
Chocolate cyst	1	03	04
Serous cystadenoma	11	12	23
Borderline serous cystadenoma	-	01	01
Serous cystadenocarcinoma	01	01	02
Mucinous cystadenoma	04	04	08
Borderline mucinous cystadenoma	02	-	02
Mucinous cystadenocarcinoma	01	-	01
Granulosacelltumor	-	01	01
Dermoid cyst	03	01	04
Twisted ovarian cyst		01	01
Borderline Brenner tumor		01	01
Mullerian cyst	01	-	01
TOTAL			**112**

The following Table No. 8 : Total patients in the study were 158 cases. Out of 158 cases, 46 cases showed BILATERAL ovarian cystic lesions.

Malignant neoplastic lesions : Bilateral malignant ovarian surface epithelial tumors were the most number of cases with BILATERAL ovarian cysts (11 cases or 23.91% cases).

Among Benign neoplastic lesions, 10 cases showed diagnosis of bilateral ovarian serous cystadenoma (21.73% of cases).Among non-neoplastic lesions, 9 cases showed diagnosis of bilateral follicular cysts (19.56% of cases).

Out of 67 neoplastic cysts, 70.14% ovarian cysts were benign, 4.49% were borderline and 13% were malignant.

Table No. 8 : Diagnosis of 46 cases with BILATERAL ovarian cystic lesions		
Left ovarian cystic lesion	**Right ovarian cystic lesion**	**Total cases**
Serous adenocarcinoma	Serous adenocarcinoma	**09**
Corpus luteal cyst	Corpus luteal cyst	02
Dermoid cyst	Dermoid cyst	01
Simple serous cyst	Simple serous cyst	05
Corpus luteal cyst	Follicular cyst	02
Follicular cyst	Follicular cyst	**09**
Corpus luteal cyst + Simple serous cyst	Follicular cyst	01
Serous cystadenoma	Serous cystadenoma	**10**
Twisted ovarian cyst	Simple serous cyst	01
Corpus luteal cyst	Simple serous cyst	01
Follicular cyst	Simple serous cyst	02
Mucinous cystadenocarcinoma	Mucinous cystadenocarcinoma	**02**
Simple serous cyst	Corpus luteal cyst	01
Inclusion cyst	Inclusion cyst	01
		46

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The biological behavior of serous cystic neoplasm and their percentage of incidencewas found (Table 9). For better understanding, 49 cases were overall cystic serous neoplasm, 67 cases were of neoplastic cysts, 61 cases were cystic SET among ovarian cysts and 170 were total ovarian cysts.

Benign serous tumor was common followed by malignant serous tumor of ovary. Malignant serous tumor of ovary was the most common malignant ovarian cystic tumor.

Table No.9 : Biological behaviour of neoplastic cysts			
Behaviour	**No. of cases**	**Percentage**	**Percentage of total no of cases**
Benign	47	70.14	27.64
Borderline	3	4.49	1.76
Malignant	17	25.37	10
Total	67	100	39.4

- ***SET*** *– Surface epithelial tumors*

Biological behavior of mucinous cystic neoplasms and their percentage of incidencewascalculated (Table 10). Benign mucinous tumor was common followed by malignant and borderline mucinous tumor of ovary.

Table No. 10 : Biological behavior of mucinous neoplastic cysts

Behavior	No.of cases	% of all cystic mucinous neoplasms	% of all neoplastic cysts	% of all cystic SET	% of all ovarian cysts
Benign	8	66.68	11.94	13.11	4.70
Borderline	2	16.66	2.98	3.27	1.17
Malignant	2	16.66	2.98	3.27	1.17
Total	12	100			

- ***SET*** *– Surface epithelial tumors*

Table No. 11 : Comparative study of incidence of different germ layers in Ovarian dermoid cysts

Histology type	% in present study (2017)	% byMarcial Rojas RA, et al. [6]	% by Blackwell WJ, et al. [7]
Ectodermal derivatives			
Stratified squamous epithelium	100	100	100
Hair follicles & sebaceous glands	94	98	97
Sweat glands	50	75	64
Apocrine glands	25	52	47
Nervous tissue	13		37
Mesodermal derivatives			
Fat	38		75
Bone	19	35	41
Cartilage	19	22	27
Endodermal derivatives			
Gastrointestinal epithelium	13	13	12
Respiratory epithelium	13	48	53

Table No. 11shows comparative study between our study and study of two foreign authors. Our five cases of Dermoid cyst – ovary showed above tabular findings.

Table No. 12 : Comparative study of neoplastic ovarian cysts

Histological type	Present study (%)	Tyagi SP, et al[8] (%)	Mehta RC&Purandare BN [9] (%)
Serous cystadenoma	**20.00**	**44.94**	**51.23**
Borderline serous tumor	0.0	-	-
Serous cystadenocarcinoma	8.8	3.37	6.61
Mucinous cystadenoma	4.70	31.46	14.87
Borderline mucinous tumor	0.58	-	-
Mucinous cystadenocarcinoma	1.17	3.37	4.95
Borderline Brenner tumor	0.58	-	-
Granulosa cell tumor	0.58	-	-
Mature cystic teratoma: Dermoid cyst	2.94	-	-
Struma ovarii	-	1.12	-
Epidermoid cyst	-	15.73	14.87
Clear cell carcinoma	-	-	-
Undifferentiated cystadenomas	-	-	7.43

Table No. 12 shows comparison between our study and two Indian authors regarding the incidence of neoplastic ovarian cysts

The following Table No. 13 shows that out of 158 cases, USG studies were conducted in 105 cases.Serosal inclusion cysts, follicular cysts, luteal cysts and chocolate cysts were predominantly completely cystic. Even majority of the serous cystadenomas were completely cystic on USG. The mucinouscystadenomas, serous cystadenomas showed cystic ovarian lesion with internal septation. Majority of the dermoid cysts showed cystic swelling with layering of internal material. Dermoid cyst containing fat and cystic fluid showed dense hypoechoic areas and which were showing areas of calcification and bone showed hyperechoic areas with shadowing.Serous cystadenocarcinoma cases showed majority of the complex cysts on USG.

Table No. 13: USG findings of 105 cystic ovarian lesions

Histological type	Completely cystic	Cystic with layering of internal material and/or hyperechoic areas	Cystic with septation	Complex, i.e. Cystic with solid
Serosal inclusion cyst	7			
Follicular cyst	17			
Luteal cyst	8			
Chocolate cyst	2	1	1	
Serous cystadenoma	20		12	2
Borderline serous tumor				
Serous cystadenocarcinoma			6	9
Mucinous cystadenoma	1		6	1
Borderline mucinous tumor				
Mucinous cystadenocarcinoma				2
Borderline Brenner tumor				1
Granulosa cell tumor	1			
Mature cystic teratoma: Dermoid cyst	1	2	1	1
Mullerian cyst	1			
Twisted ovarian cyst	2			

Table No. 14

Final HPR No.	Associated finding/ pre-operative biopsy : Ovarian cystic malignancies
W15/210	Ascitic fluid & Ovarian cystic fluid cytology:- Adenocarcinoma cells
W15/1067	Biopsy:- Moderately differentiated adenocarcinoma
W16/1968	Biopsy:- Serous papillary cystadenocarcinoma
W17/1379	Biopsy:- Poorly differentiated epithelial malignancy
W17/2018	Ascitic fluid & Ovarian cystic fluid cytology:-:- Metastatic epithelial malignancy
W14/714	Biopsy:- Serous adenocarcinoma
W14/747	Biopsy :- Serous adenocarcinoma
W15/210	Biopsy :- Serous adenocarcinoma
W15/595	Biopsy :- Serous adenocarcinoma
W15/1067	Biopsy :- Serous adenocarcinoma
W16/477	Biopsy :- Serous adenocarcinoma
W16/1661	Biopsy :- Serous adenocarcinoma
W16/1968	Biopsy :- Serous papillary cystadenocarcinoma
W17/51	Biopsy :- Serous Cystadenocarcinoma
W17/1064	Biopsy :- Mucinous Cystadenocarcinoma
W17/1379	Biopsy :- Mucinous Cystadenocarcinoma
W17/2018	Biopsy :- Serous Cystadenocarcinoma

Table No. 14 shows associated findings with ovarian cystic malignant lesions. Out of 158 cases and 170 cysts, 18 were malignant cysts on final surgical specimen. Pre-operative biopsy was available in 15 of these 18 cases.

The biopsy findings were compared with final histopathology report of the operated specimen. 11 cases show associated finding of serous cystadenocarcinoma on pre-operative biopsy. These findings were confirmed on final histopathology report of the operated specimen. Mucinous cystadenocarcinoma was noted in pre-operative and post-operative specimen in two cases.

One pre-operative biopsy was diagnosed as poorly differentiated adenocarcinoma which turned out to be mucinous cystadenocarcinoma on final operated specimen. One pre-operative biopsy was diagnosed as moderately differentiated adenocarcinoma which turned out to be serous cystadenocarcinoma on final operated specimen.

Ascitic fluid cytology was positive for malignancy and ovarian cystic fluid cytology was possible in two of the malignant ovarian cystic cases. Both cases turned out to be serous cystadenocarcinoma on final operated specimen. This means that surface epithelial malignant tumor of malignant serous cyst spreads to the ascitic fluid easily due to its surface epithelial tumor origin and its trans-coelomic spread.

Cervical PAP smear was done in five cases with features of inflammatory smears (NILM). Left breast fibroadenoma was noted to be associated with one case of chocolate cyst.

V. Gross And Microscopy : Figures

Fig 1 Specimen of ovary showing multiple serosal inclusion cysts

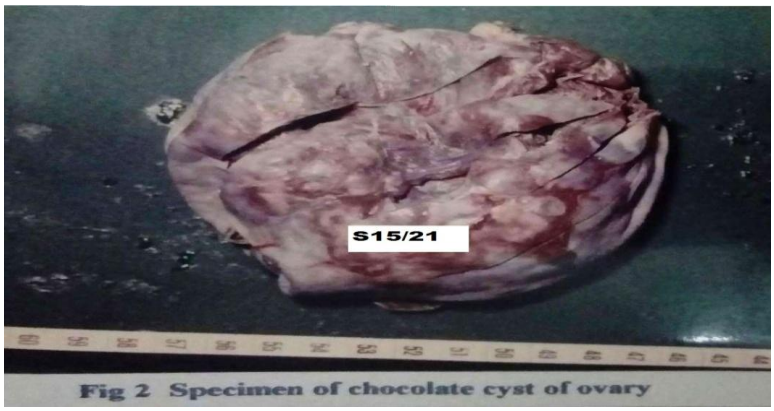

Fig 2 Specimen of chocolate cyst of ovary

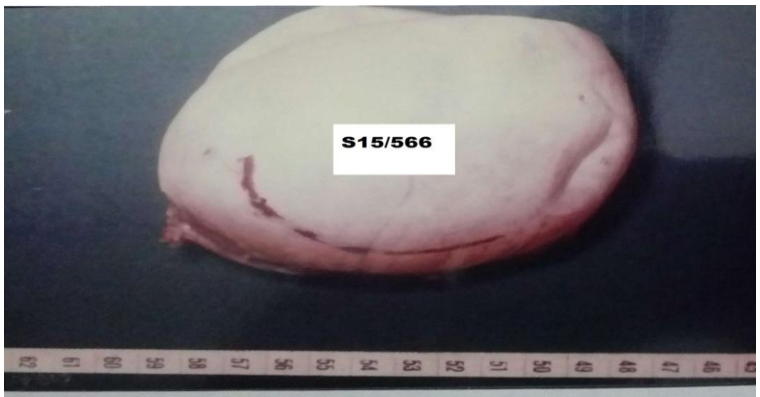

Fig 3 Specimen of unilocular serous cystadenoma

Fig 4 Specimen of uterus with serous cystadenocarcinoma of left ovary

Fig 5 Specimen of uterus along with both tubes and ovaries showing a large mucinous cystadenoma of left ovary

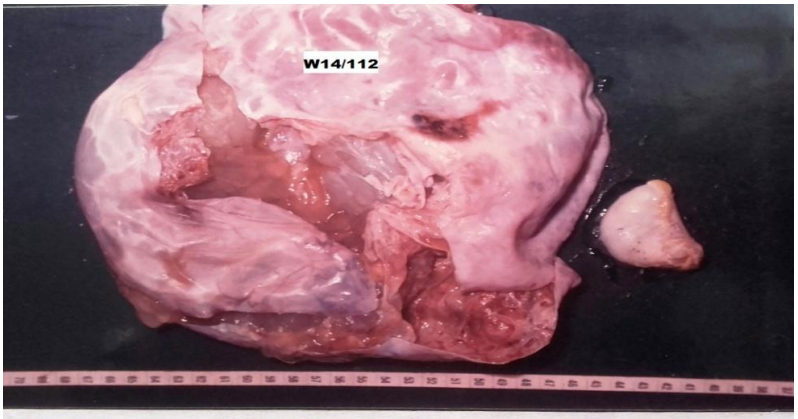

Fig 6 Cut section of ovary showing multilocular mucinous cystadenoma

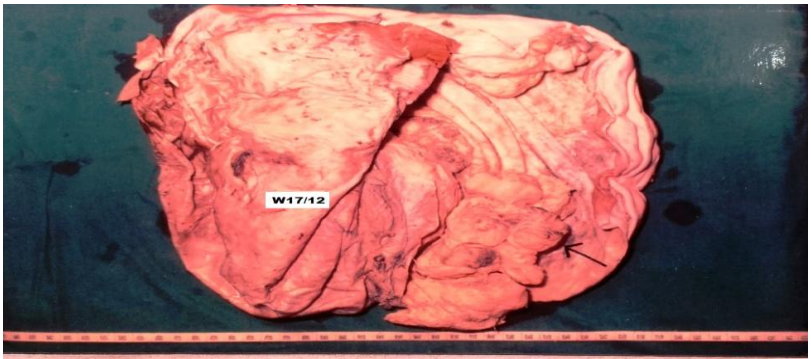

Fig 7 Specimen of mucinous cystadenocarcinoma on cut section showing solid areas

Fig 8 Specimen of dermoid cyst showing skin and a tangle of hair

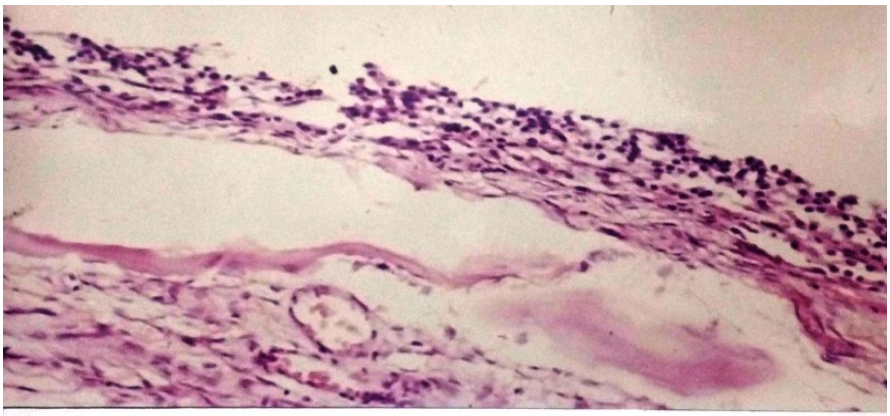

Fig 9 Follicular cyst lined by cells of follicular origin (H & E X 100)

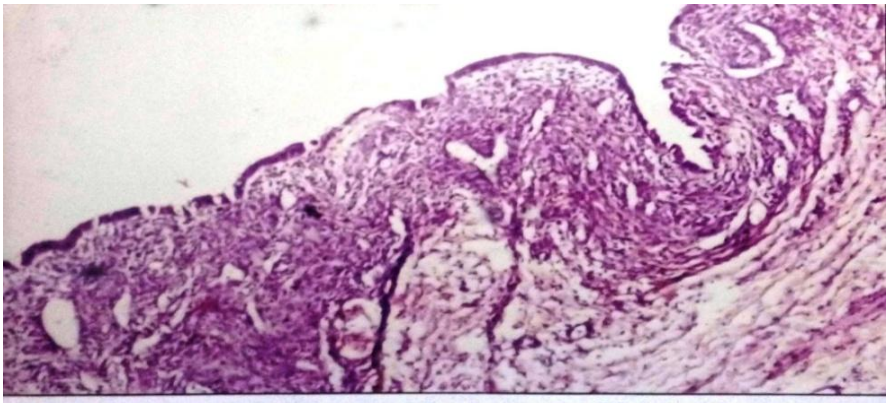

Fig 10 Section of chocolate cyst showing mucosal lining and stroma of endometrial type (H & E X 40)

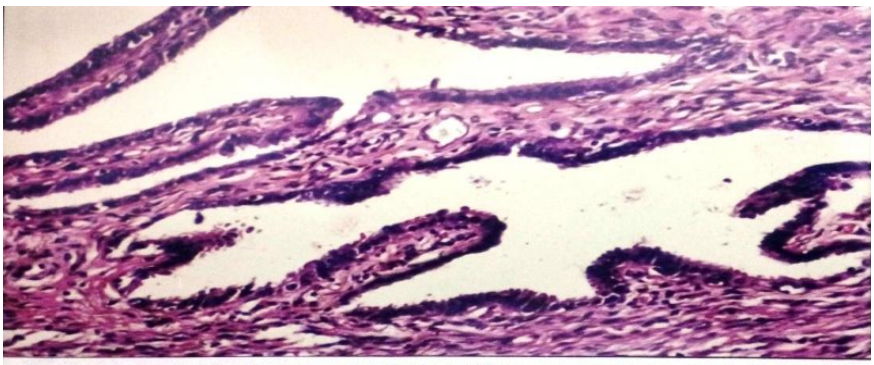

Fig 11 Serous cystadenoma showing papillary architecture (H & E X 100)

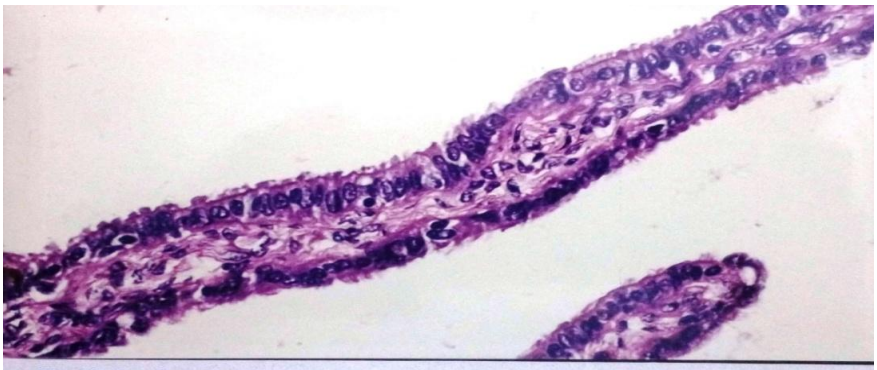

Fig 12 Section of same serous cystadenoma as above showing papillae lined by ciliated cells giving a 'Brush border' appearance (H & E X 200)

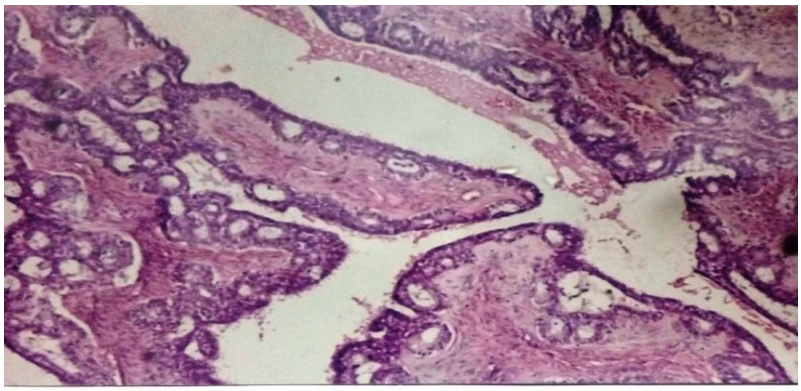

Fig 13 Borderline serous cystadenoma : Papillae lined by multilayered epithelium with no evidence of stromal invasion (H & E X 40)

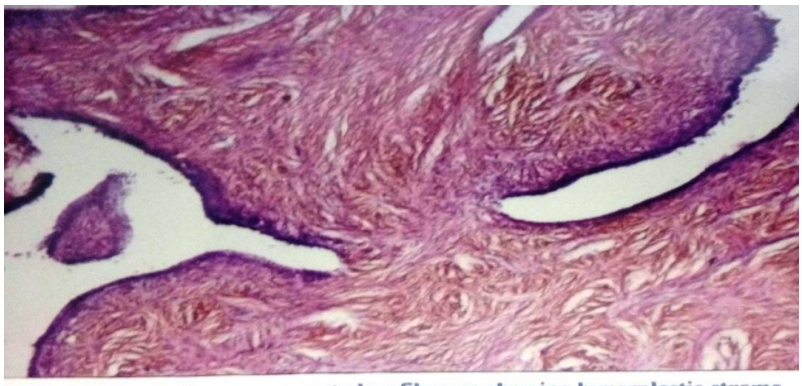

Fig 14 Borderline serous cystadenofibroma showing hyperplastic stroma (H & E X 40)

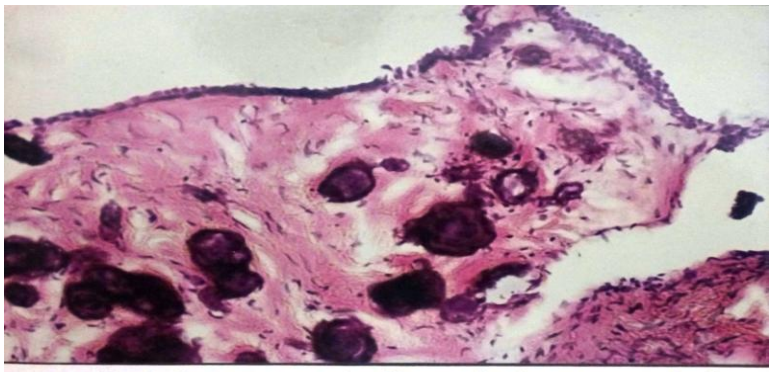

Fig 15 Borderline serous cystadenofibroma showing psammoma bodies (H & E X 100)

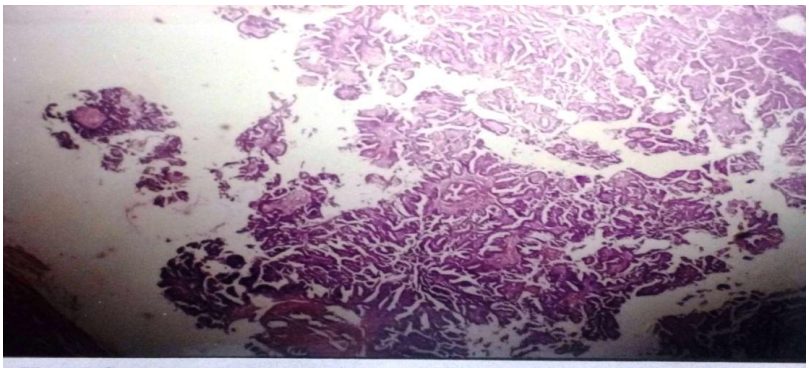

Fig 16 Serous cystadenocarcinoma with complex papillary pattern (H & E X 10)

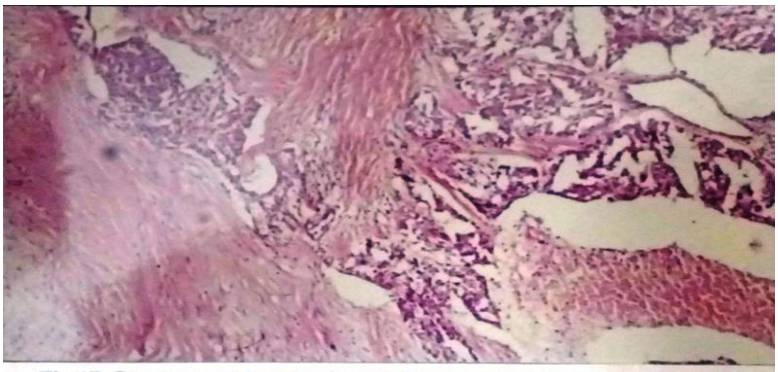

Fig 17 Serous cystadenocarcinoma showing extensive areas of necrosis with stromal invasion (H & E X 40)

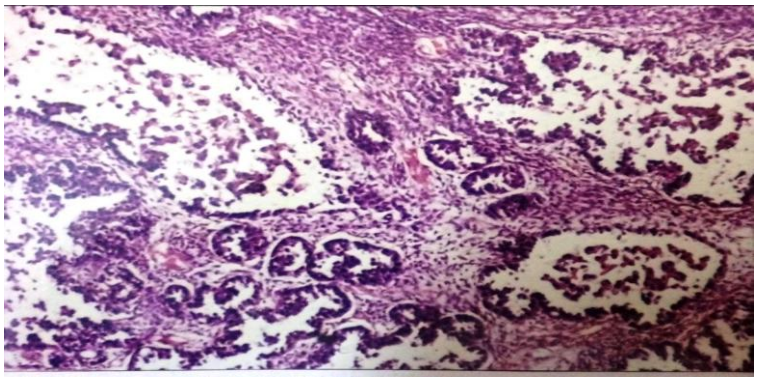

Fig 18 Serous cystadenocarcinoma showing invasion of stroma by glands (H & E X 40)

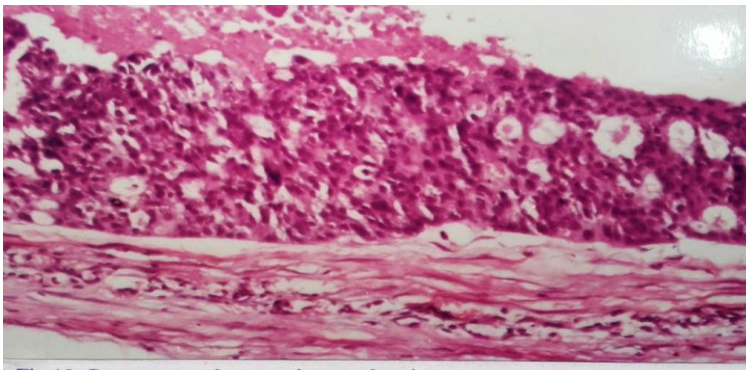

Fig 19 Serous cystadenocarcinoma showing multilayering (more than 4 cell thickness) with loss of polarity and hyperchromasia of lining cells (H & E X 100)

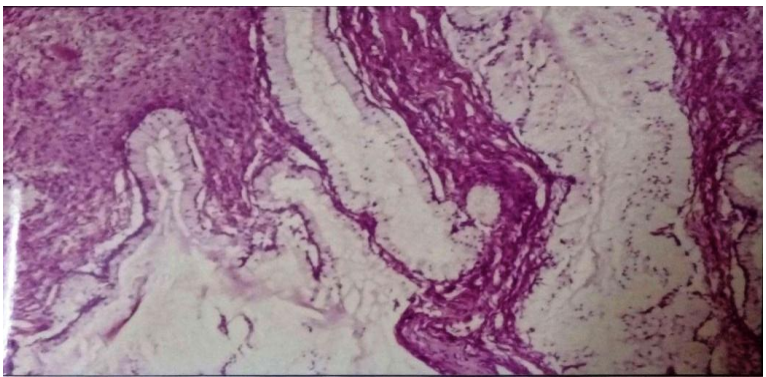

Fig 20 Mucinous cystadenoma showing glands lined by tall columnar cells, basal nuclei and intraluminal mucin (H & E X 40)

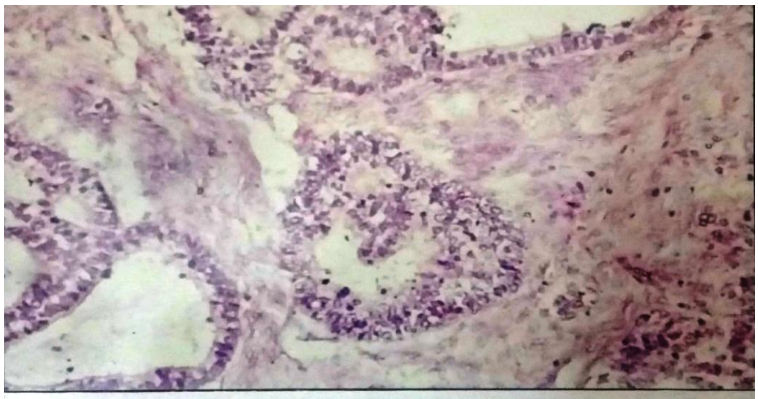

Fig 21 Borderline mucinous cystadenoma showing multilayering of epithelium with atypia of cells (H & E X 100)

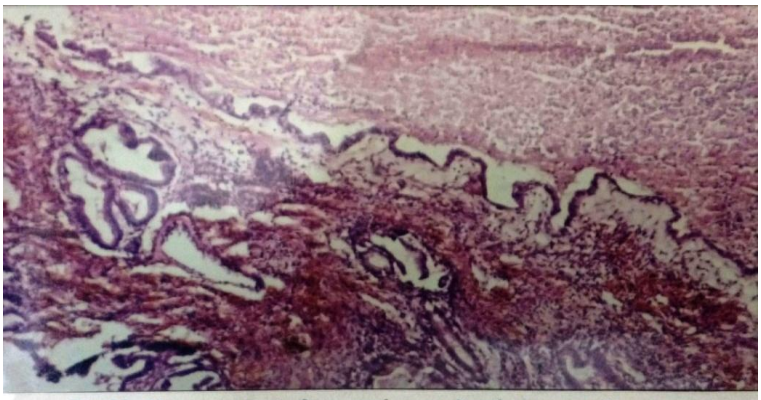

Fig 22 Mucinous cystadenocarcinoma showing areas of necrosis, hemorrhage and stromal invasion (H & E X 40)

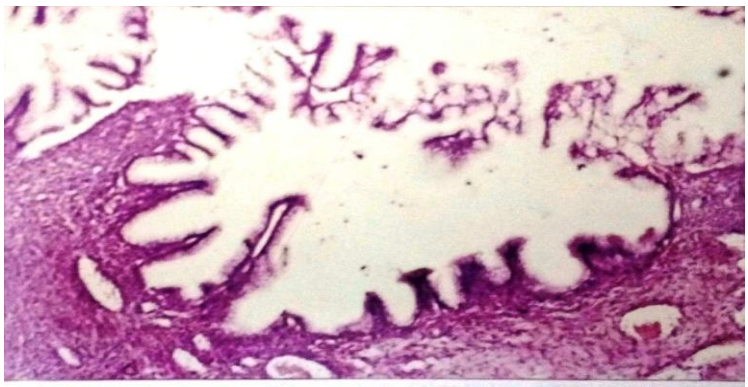

Fig 23 A case of mucinous cystadenoma with an associated dermoid showing mucinous cystadenoma component (H & E X 40)

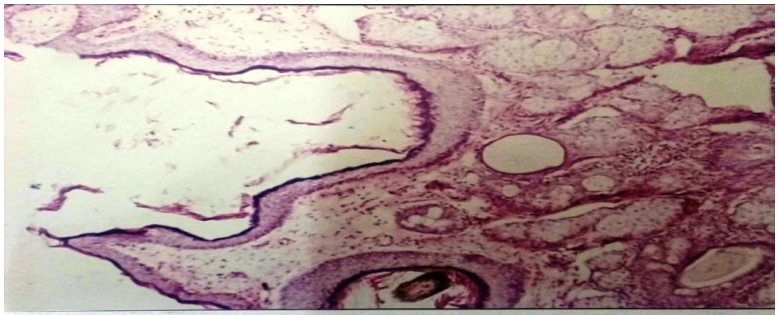

Fig 24 Same case as above showing a dermoid cyst component in the same tumor (H & E X 40)

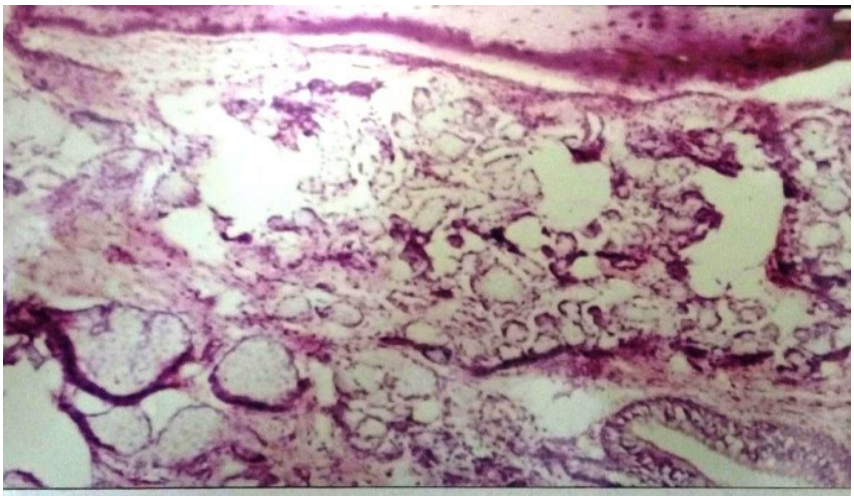

Fig 25 Dermoid cyst showing bone, sebaceous glands, sweat glands and respiratory type of epithelium (H & E X 40)

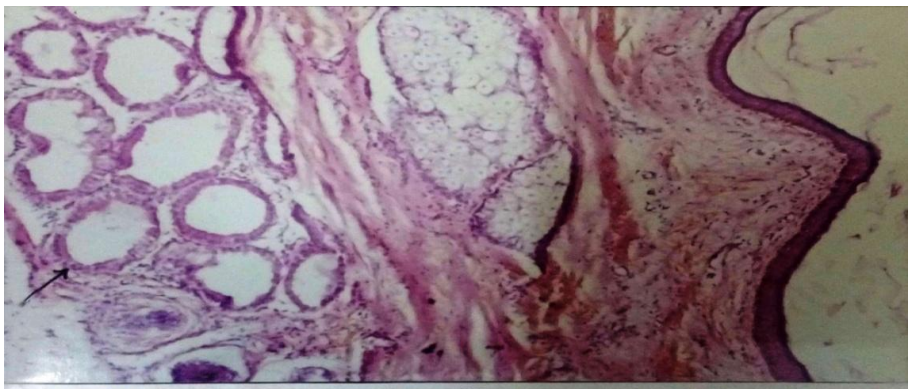

Fig 26 Dermoid cyst showing stratified squamous epithelium, sebaceous glands and apocrine glands (H & E X 40)

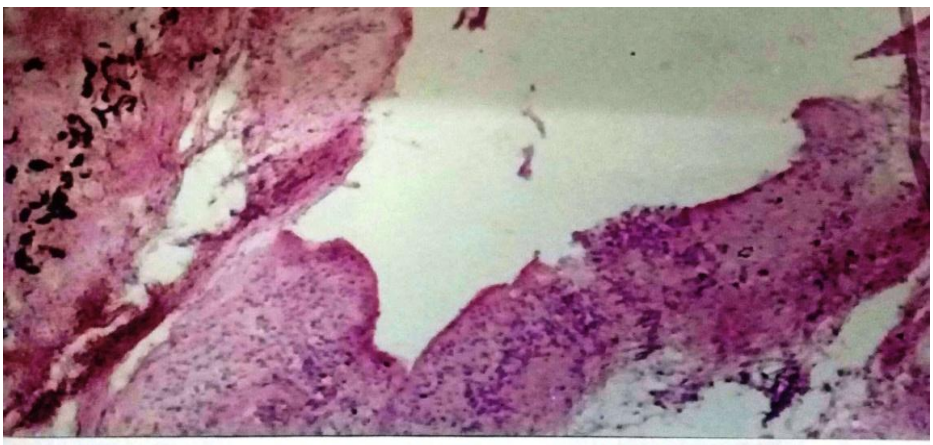

Fig 27 Dermoid cyst showing Melanocytes and Glial tissue (H & E X 40)

VI. Conclusion

Most women of reproductive age develop small cysts each month, and large cyst that cause problems that occur in about 8% of women before menopause. Overall benign lesions were higher in incidence than malignant cystic lesions among neoplastic ovarian cysts.Malignant serous tumor of ovary was the most common malignant ovarian cystic tumor. Pre-operative guided biopsy helps in prompt management and subsequent better survival, especially in malignancy cases. Biopsy findings are often subsequently well correlated with histopathology findings of final resected specimens. This infers the importance of pre-operative biopsies in cystic lesions of ovary.

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