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OUTLOOK OF OVARIAN CANCER AMONG SURGICAL OVARIAN SPECIMENS IN ALEX-EKWUEME FEDERAL UNIVERSITY TEACHING HOSPITAL ABAKALIKI

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ABSTRACT

Ovarian cancer is a malignant tumor of the ovary, usually a carcinoma. Ovarian cancer is not readily detected in the early stage, and this is because of the wide ranging pathology and imperfect understanding of its cause. This study was carried out to evaluate the prevalence of ovarian cancer among surgical ovarian specimen in Alex-Ekwueme Federal Teaching Hospital Abakaliki. Women within related groups such as ages, lifestyle, relationships, and occupation were the perfect subject for this research. Nonetheless, archived block tissue samples from histopathology laboratory were used in this research. (311) three hundred and eleven archived blocks were sectioned and stained Several special stains like haematoxylin and eosin stain, Periodic acid Schiff stain, silver stain were used as diagnostic criterion for histological evaluation of ovarian diseases as they present clear and understandable features which demonstrate the disease conditions in tissue with variance in both benign cases and malignant cases having a better and rapid diagnostic criterion for ascertaining the stages of the disease. Various physical comparative data were further exploited with regards on their predisposing factors to the diseases. The analysis on percentage on how these physical factors interfere to bring about Ovarian diseases were obtained and these predisposing factors display a clear concomitant ratio show the prevalence of ovarian cancer in certain age groups, occupation, marital status, lifestyle, obesity and breastfeeding. Therefore, this research covers a broader range of diagnostic success in ovarian cancer as well as its associated physical risk factors which if considered can lower the occurrences and ameliorate the increasing cases of the disease.

***Keywords**: outlook, ovarian cancer, surgical ovarian specimens*

INTRODUCTION

Ovarian cancer is a malignant tumour of the ovary, usually a carcinoma. Ovarian cancer is not readily detected in the early stages of development, when the tumour is small and produces few suspicious symptoms. this is because of the wide ranging pathology and an imperfect

understanding of its causes. In their classification, borderline ovarian tumors or "cystadenomas with proliferative activity of the epithelial cells and nuclear abnormalities but no infiltrative destructive growth" were recognized as a separate entity from benign cystadenomas and malignant cystadenocarcinomas (Zhang *et al*., 2007).

Scientists continue to study the genes responsible for familial ovarian cancer. This research is beginning to yield clues about how these genes normally work and how disrupting their action can lead to cancer. This information eventually is expected to lead to new drugs for preventing and treating familial ovarian cancer. Research in this area has already led to better ways to detect high-risk genes and assess a woman's ovarian cancer risk. A better understanding of how genetic and hormonal factors (such as oral contraceptive use) interact may also lead to better ways to prevent ovarian cancer.

New information about how much BRCA1 and BRCA2 gene mutations increase ovarian cancer risk is helping women make practical decisions about prevention. For example, mathematical models have been developed that help estimate how many years of life an average woman with a BRCA mutation might gain by having both ovaries and fallopian tubes removed to prevent a cancer from developing. Studies have shown that fallopian tube cancers develop in women with BRCA gene mutations more often than doctors had previously suspected. However, it is important to remember that although doctors can predict the average outcome of a group of many women, it is still impossible to accurately predict the outcome for any individual woman

Aim

To determine the outlook of ovarian cancer among ovarian surgical specimen in AE-FETHA

MATERIALS AND METHOD

Study Area

Samples for this research were obtained from archived patients block samples in Alex-Ekwueme Federal University Teaching Hospital, Abakaliki.(AE-FUTHA).

Study population

Samples for this research was collected from archived tissue blocks at AE-FUTHA, Abakaliki, Ebonyi state, Nigeria.

Ethical Clearance

A letter of introduction was submitted to the head of unit of histopathology laboratory, AE-FUTHA I, requesting for permission to use archived tissue samples from the histopathology laboratory for this research work and access to histopathology register and bench books to obtain the patients information in line with ethical best practice in research holding patient confidentiality at high esteem.

Estimation of Sample Size

Sample size was calculated using the formula below (Fisher, *et al.,* 1998)

$$n = \frac{Z^2P(1-P)}{d^2}$$

where

n= the desired sample size

Z = the standard normal deviate usually set at 1.96, which corresponds to the 95% confidence interval.

P= the proportion of patients with ovarian cancer which is 19.2%.

d= the degree of accuracy desired (absolute precision), which is 5.0% (0.05).

$$n = \frac{Z^2P(1-P)}{d^2} \quad n = \frac{[1.96]^2[0.808][0.719]}{[0.05][0.05]} = 311$$

Since the population during the study period was below 10,000, the sample adjusting formula was applied. Sample size adjustment was done using the following formula

$$nf = \frac{n}{1+N/n}$$

Where:

nf= The desired sample size (when population is less than 10,000)

N = Total population

n= The desired sample size (when population is more than 10,000) =310

$$nf = \frac{n}{1+N/n}$$

$$nf = \frac{311}{1+1178/311}$$

$$nf = 65$$

therefore, the sample size is **65**

Thus the estimated minimum sample size was 65 but I examined a total of 311 archived blocks.

Study design

This is experimental research designed, Ovarian cancer can be easily and accurately diagnosed histochemically in the histopathology laboratory, with the use of various special stains the cancerous cells would be clearly appreciated as all distinct malignant features are clearly highlighted and demonstrated.

Materials used for the study

Tissue blocks from already processed samples in FETHA 1, microtomy , water bath, 20% alcohol, frosted end tissue slide, cover slip, special stains such as: Silver metallic stain, Haematoxylin stain, Eosin stain, Periodic acid Schiff stain, mountant, differentiator 1% acetic acid, microscope, android phone for photomicrograph.

Sample Collection, Preparation and Staining

Sample collection

Samples for this research work were collected from archives of histopathology laboratory, AE-FUTHA, Abakaliki. Formalin fixation and paraffin embedding of tissues preserves the morphology and cellular details of tissue samples. Thus it has become the standard preservation procedure for diagnostic surgical pathology. The long-term storage of formalin-fixed, paraffin-embedded (FFPE) blocks at ambient temperature is more cost effective than storing frozen tissues at ultra-low temperatures due to maintenance, space, and labor costs. Pathology departments routinely archive vast numbers of FFPE blocks as compared to frozen tissues. This largely untapped resource represents an extensive repository of tissue material with a long-term clinical follow-up, providing a valuable resource for translational clinical research.

Formalin-fixed paraffin-embedded blocks are human tissue derivatives obtained during routine diagnostic or therapeutic procedures in hospitals. Tissues procured from patients are referred to the pathology department, cut into sections, and embedded into paraffin blocks for histopathologic examination. The blocks are stored in the archives of pathology laboratories for many years to be available for possible tests and re-examinations and research.

Sample Preparation

The archived tissue blocks 311 of them embedded in paraffin wax, were taken to the microtome machine and thin sections were obtained after which were spread in 20% alcohol an then transferred to the water bath. (floating in and out) the thin sections were attached to clean grease-free glass slides and then properly dried in hot air for proper adhesion.

The slides were then ready for staining.

Staining

Hematolxylin and Eosin Staining Procedure

The H&E staining procedure was followed as stated by Okorie (2021).

Sections were de-waxed in two changes of xylene for 5minutes each afterwards were hydrated in descending grades of alcohol. It was then taken to water. The sections were then stained in Harris haematoxylin for 15 minutes then were rinsed in water, differentiated in 1%acid alcohol and then subsequently rinsed in water. It was blued in Scott's tap water for 10minutes. The sections were thereafter counter stained in eosin for 5minutes, rinsed in water, dehydrated using ascending grades of alcohol following clearing in xylene and then mounted using DPX mountant.

PAS Staining Procedure

The sections were de-waxed in 3 changes of xylene and hydrated in descending grades of alcohol after which the sections were taken to water. The sections were passed through Periodic acid for 10 minutes, then were washed thoroughly in tap water, rinsed in distilled water and then passed through Schiff's solution for 20 minutes. Sectionswere then washed thoroughly in running water. Following that, the sections were counter stained progressively in haematoxylin for 5minutes, Blued in Scott's tap water, dehydrated in ascending grades of alcohol, cleared and mounted using DPX mountant. (Okorie, 2021)

PHOTOMICROGRAPH OF OVARIAN TUMOUR

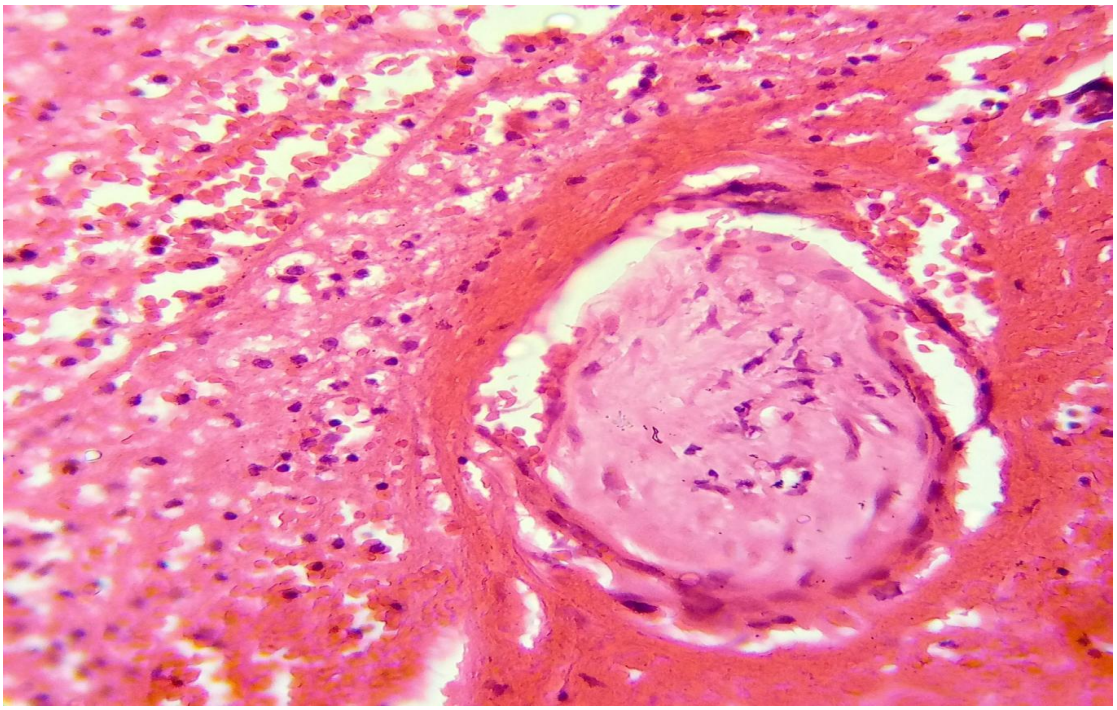

Plate 1a Mag. X40

Plate 1a is a benign ovarian tumour, the fibrous epithelial infiltrates the follicle nest (), seen also includes the inflammatory cells.

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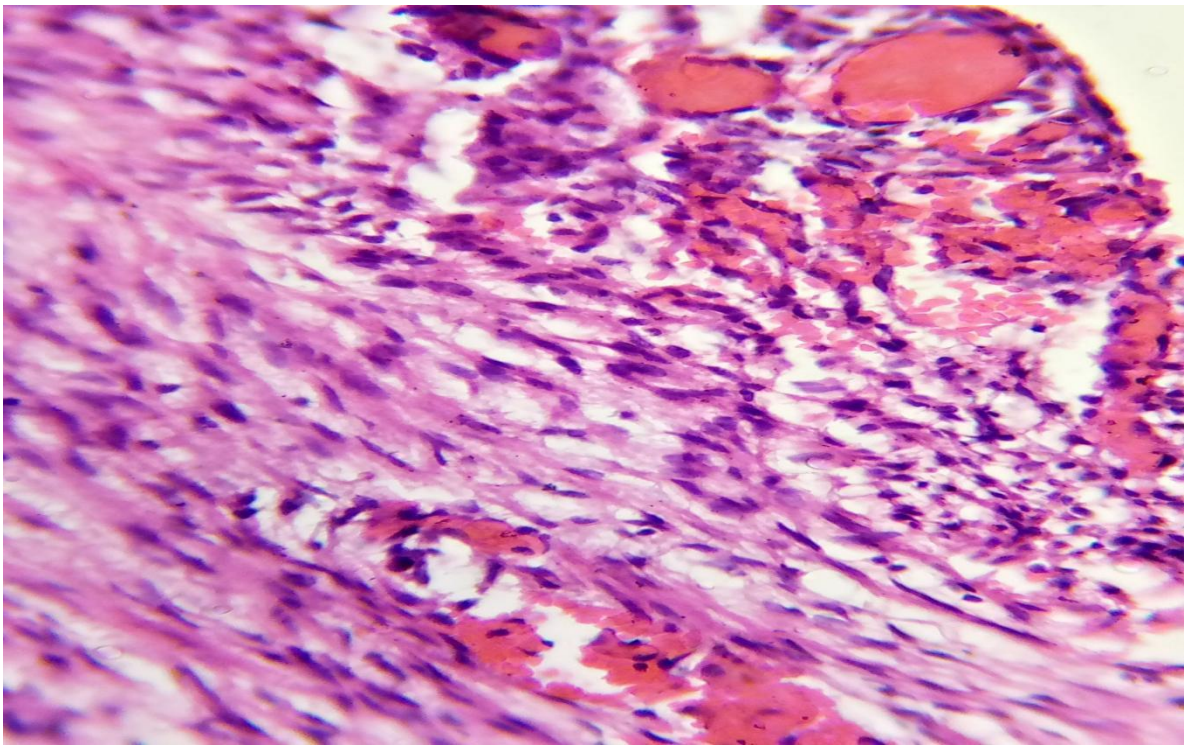

Plate 1b Mag. X40

Plate 1b is ovarian section of stained with Haematoxylin and eosin stain; section shown characteristics overian enlargement with thickening of the outer cortex; it is a polycystic ovarian syndrome

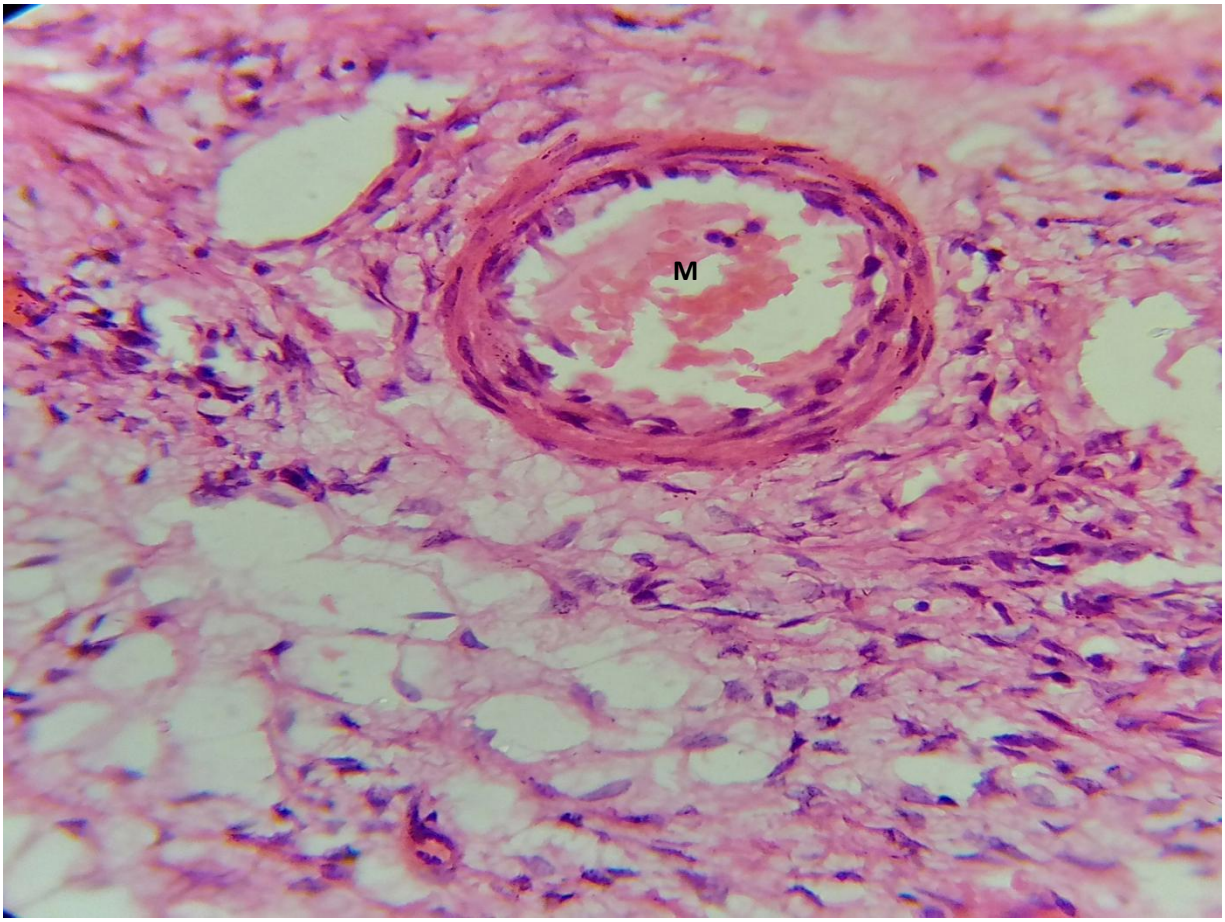

Plate 1c Mag. X40

Plate 1c is ovarian section from a young woman, the section is characterized by smooth muscles surfaces composed of ovarian capsule. The cystic locules are filled with mucin **(M**)

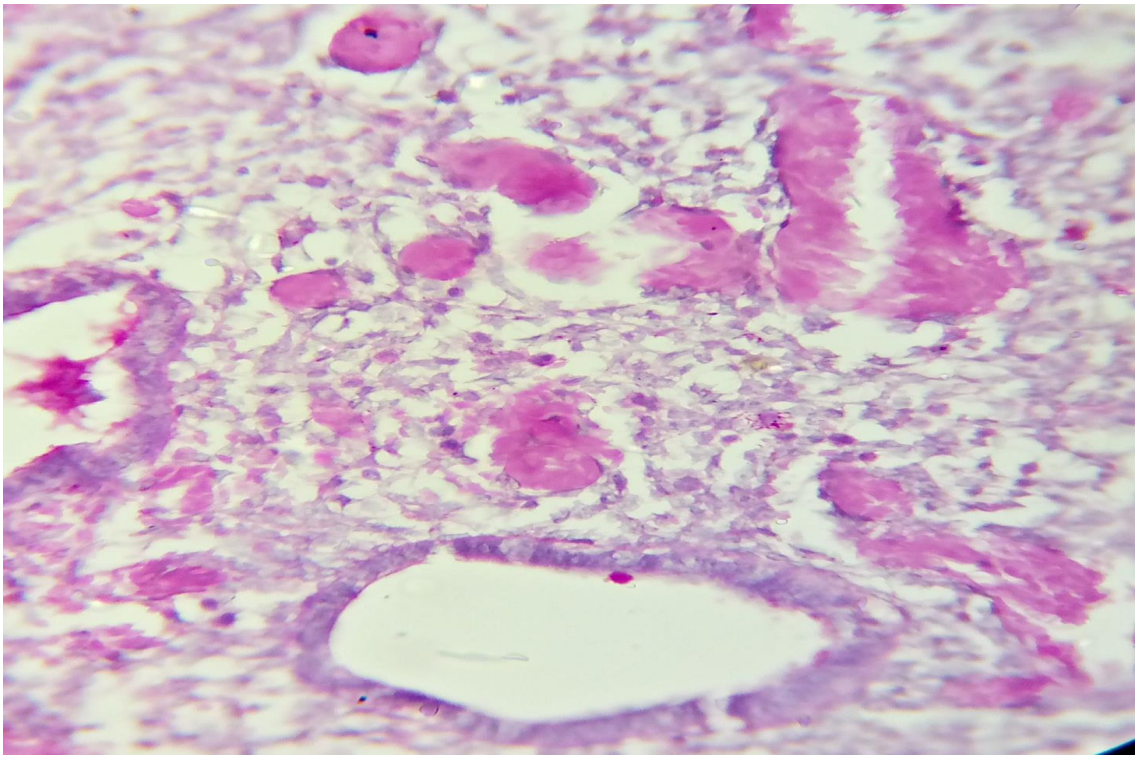

Plate 1dMag. X40

Plate 1d is ovarian tissue stained with periodic acid Schiff, section revealed a simple cuboidal epithelium with in folding muscular mass, it is a germinal cyst

PHOTOMICROGRAPH OF BENIGN OVARIAN SECTIONS

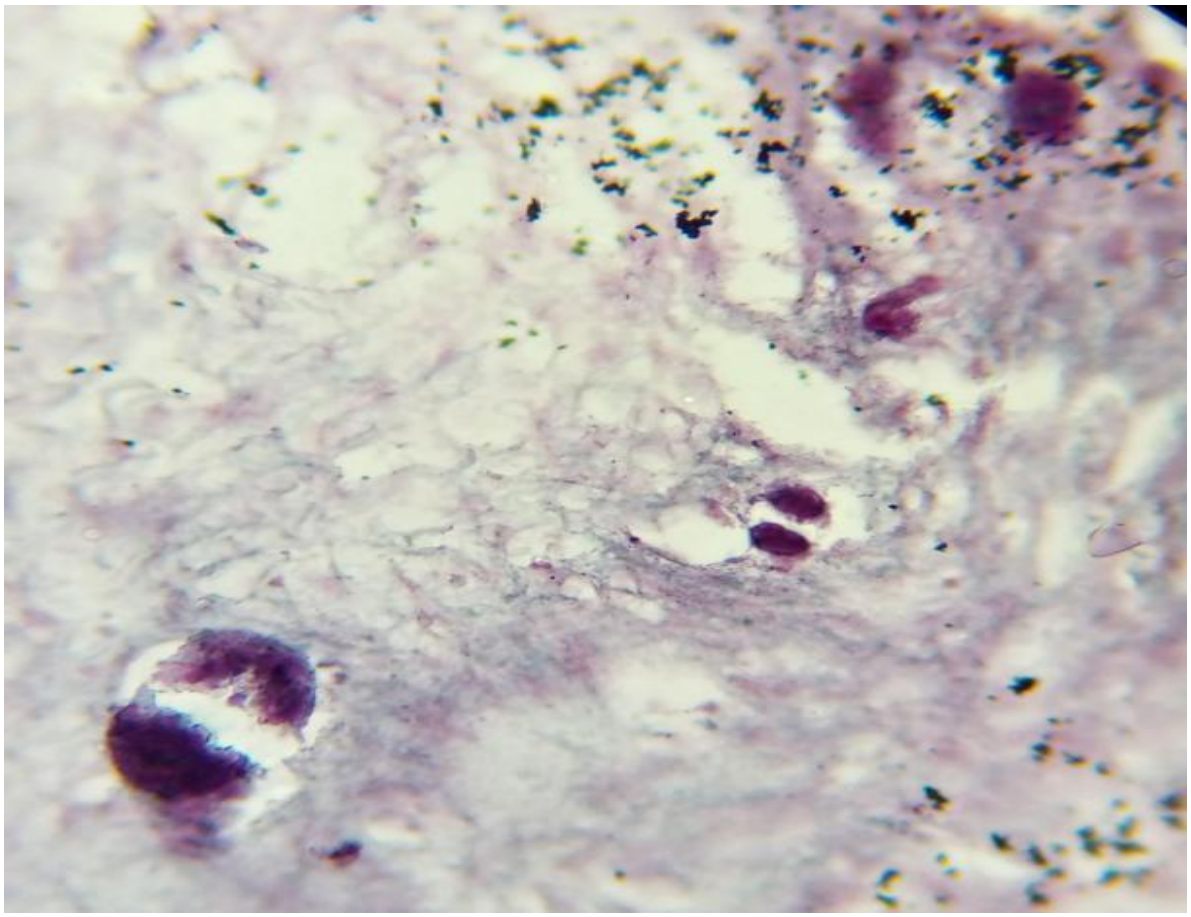

Plate 4.2aMag. X40

The above ovarian tissue section show benign ovarian section stained with silver stain(A).

Okorie N., Obeagu E.I., Orji C.F., Ibe O.E., Obi I.A., Ogbonna N.I. Outlook of Ovarian Cancer among Surgical Ovarian Specimens in Alex-Ekwueme Federal University Teaching Hospital Abakaliki. Journal of Medicine and Health Sciences. 2021; 1(2) 1-30.

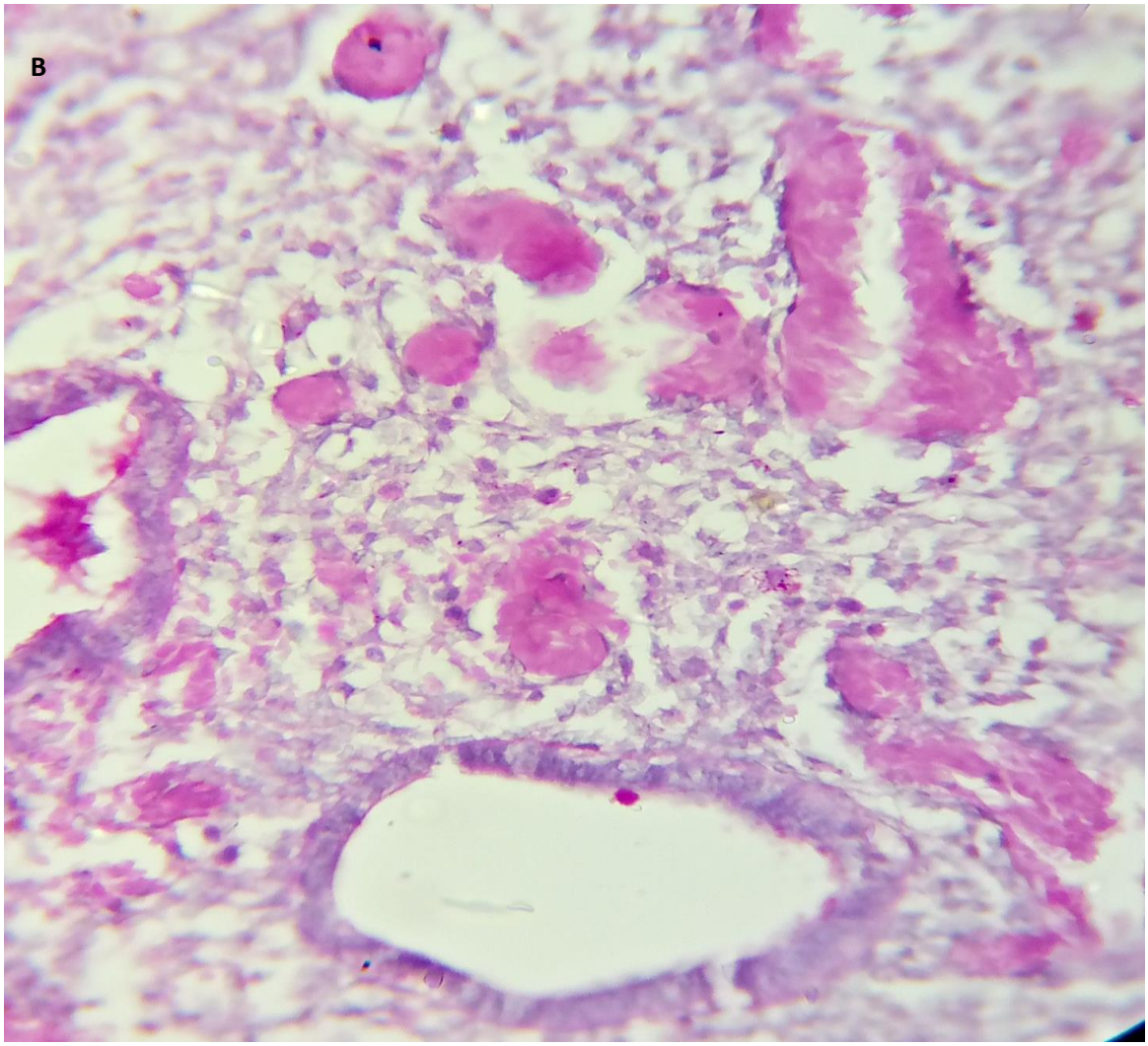

Plate 2bMag. X40

The above ovarian tissue section show benign ovarian section stained with Periodic acid Schiff (B).

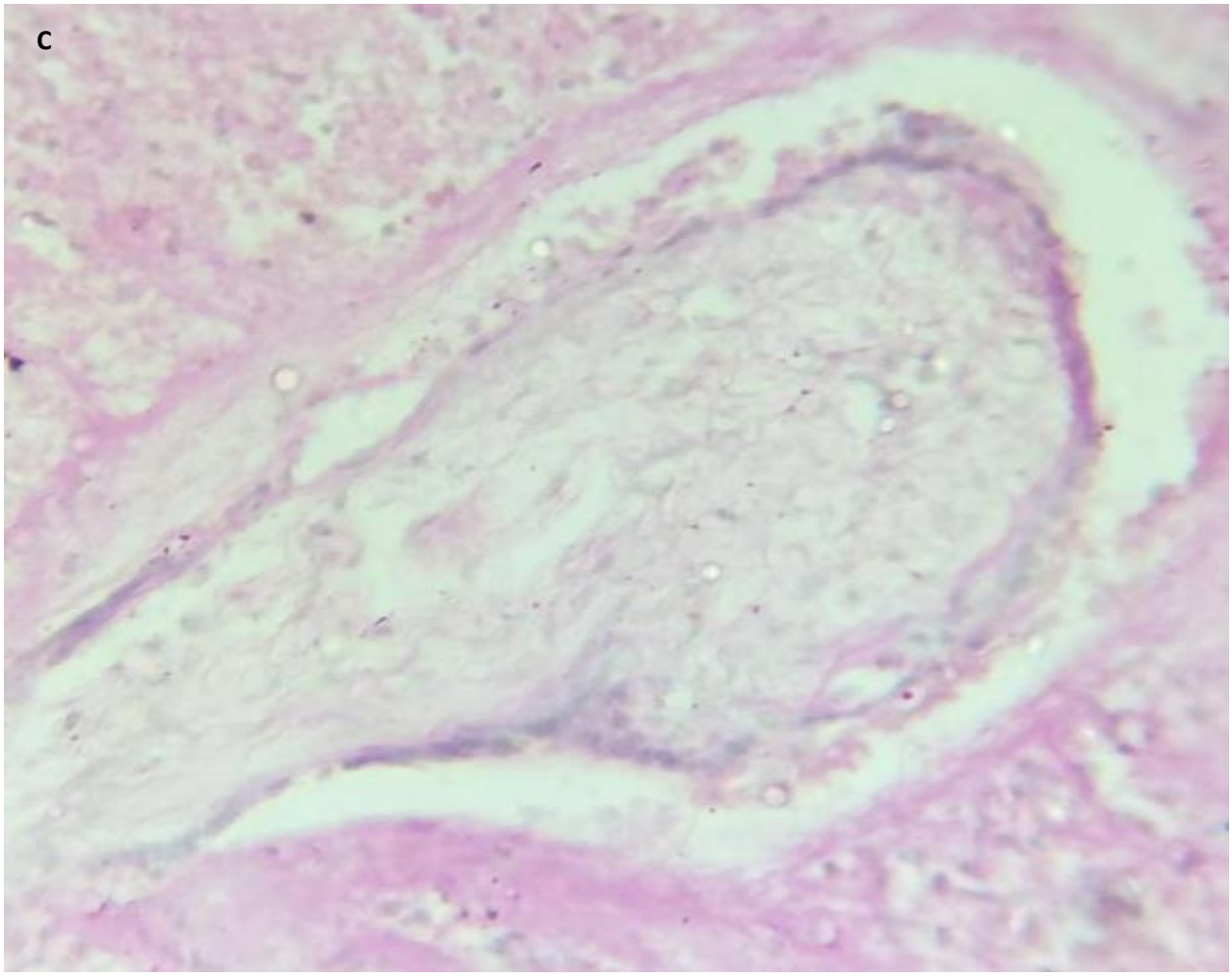

Plate 2cMag. X40

The above ovarian tissue section show benign ovarian section stained with Van gieson Stain (c)

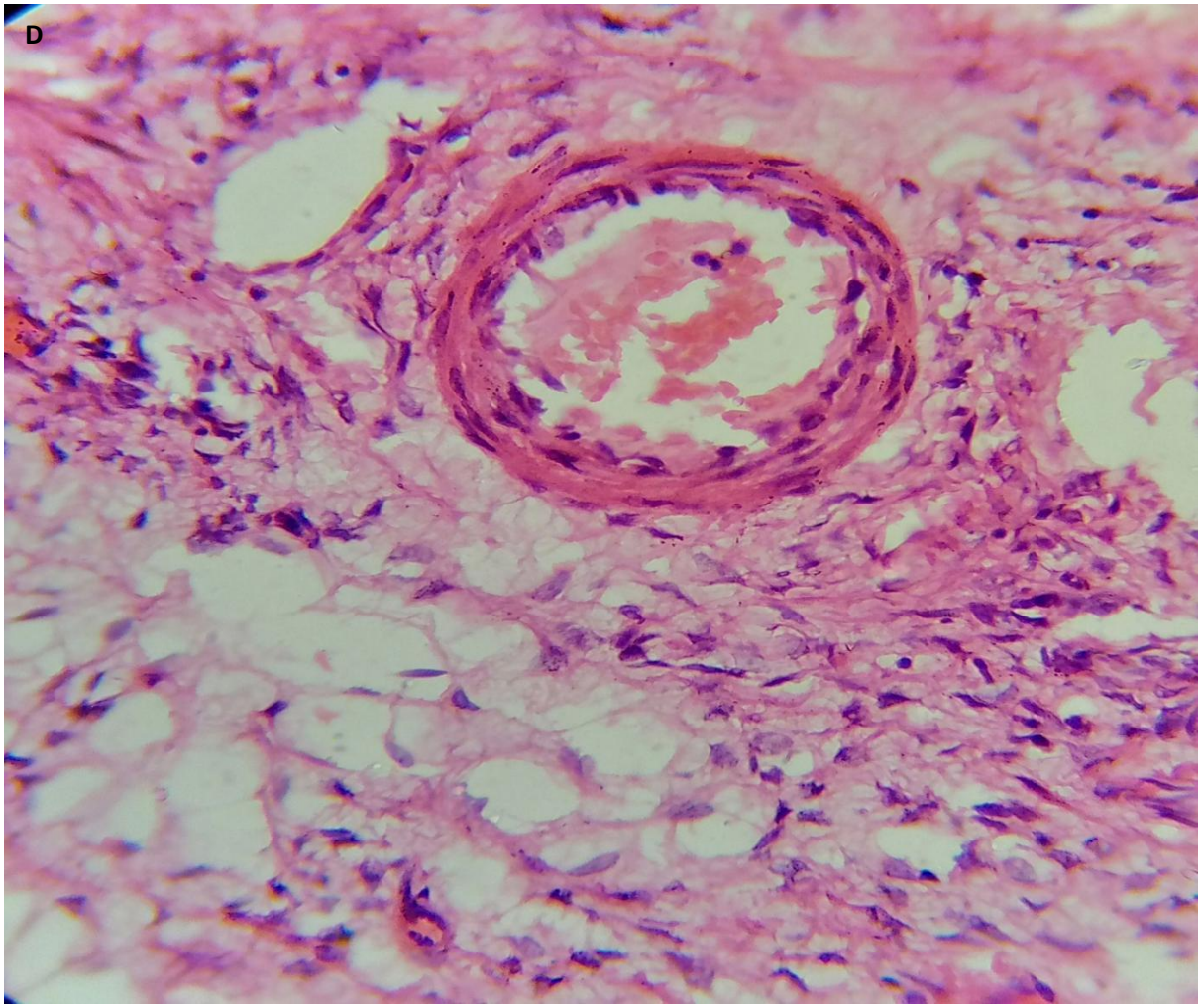

Plate 2d Mag. X40

The above ovarian tissue section show benign ovarian section stained with Haematoxylin and Eosin stain (D)

PHOTOMICROGRAPH OF MALIGNANT OVARIAN TISSUE

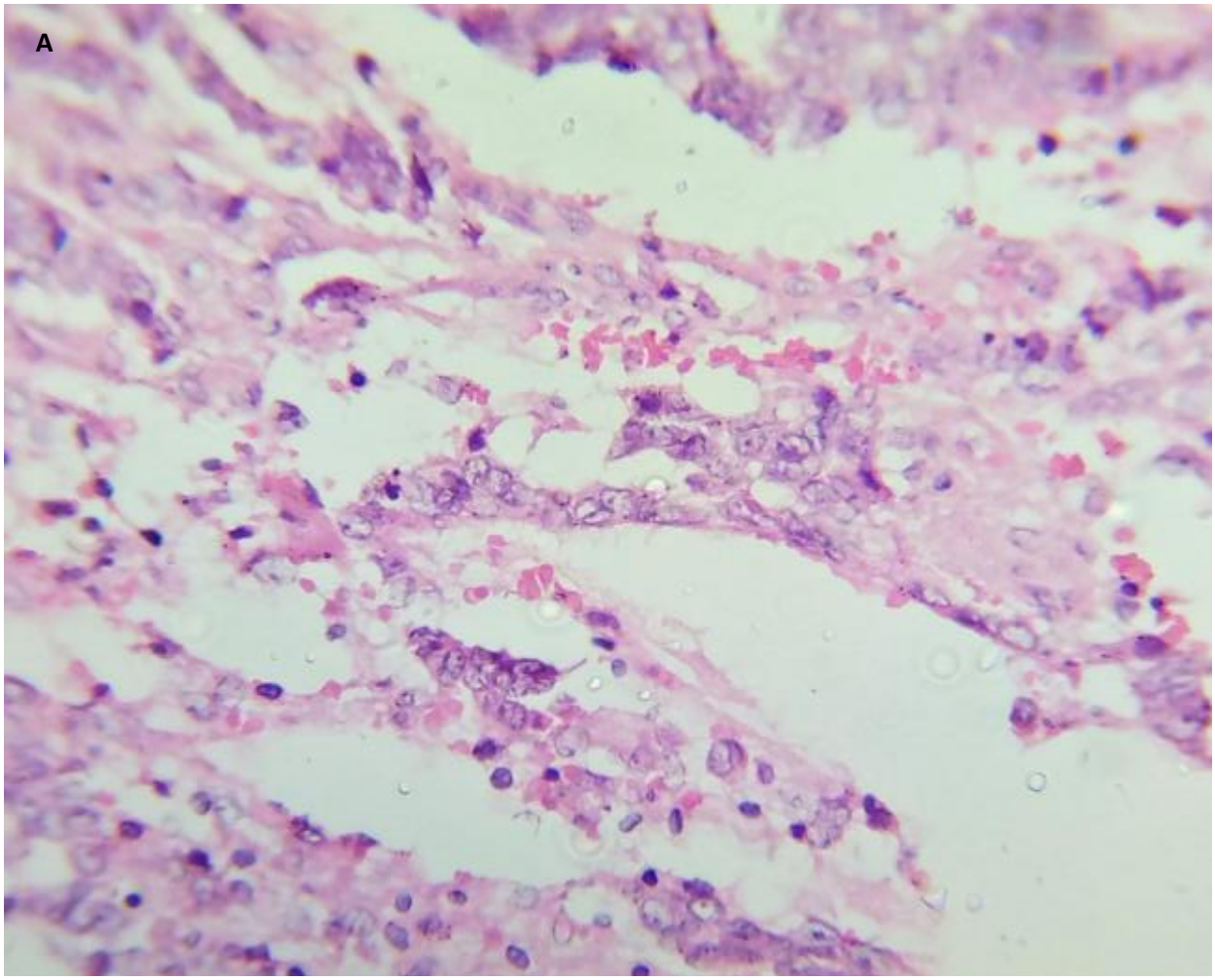

Plate 4.3a Mag. X40

Plate 3a is a slide section of ovarian cancer stained in special stain: silver stain(A).

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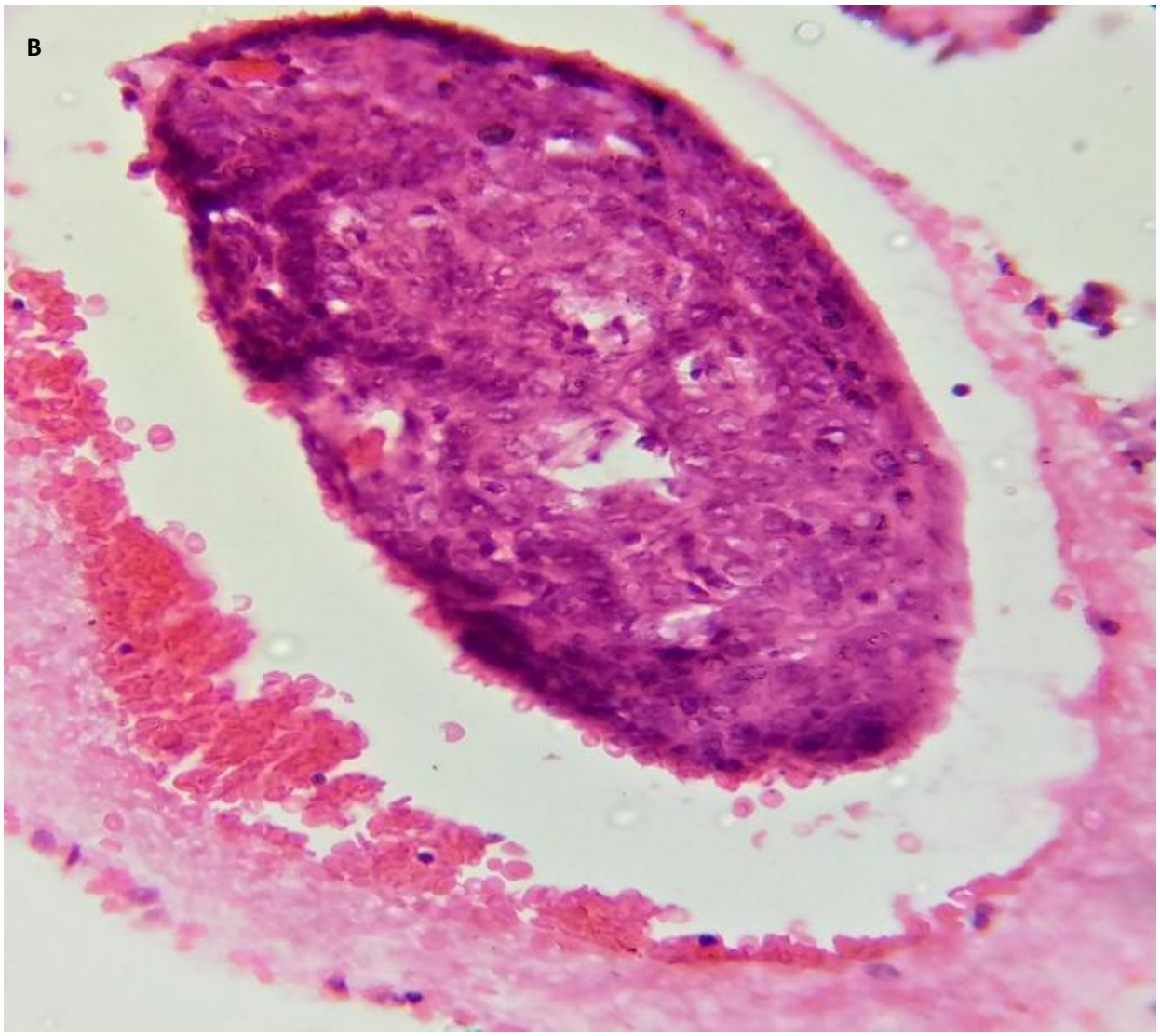

Plate 3b Mag. X40

Plate 3b is a slide section of ovarian cancer stained in routine stain: Haematoxylin and Eosin (B),

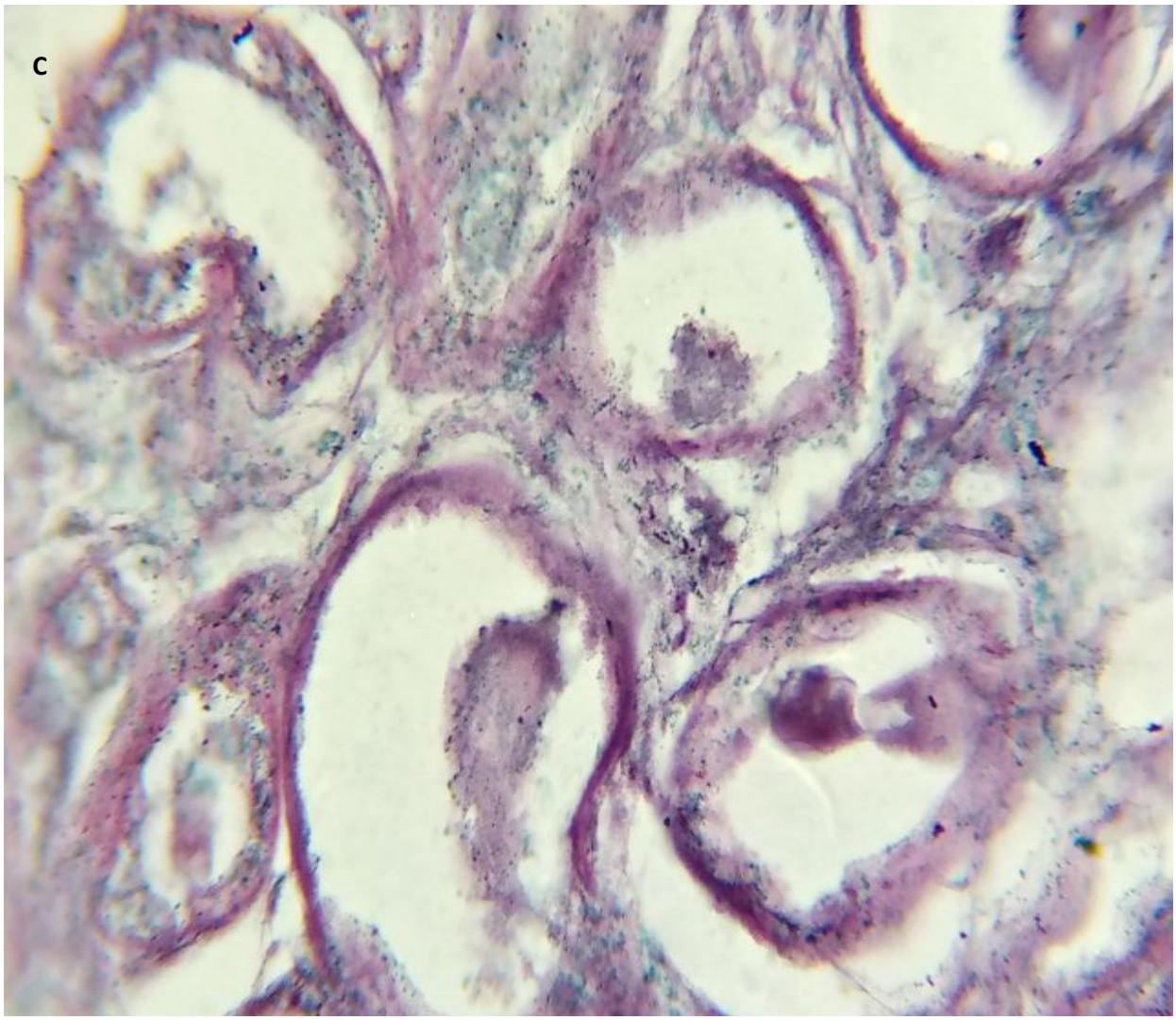

Plate 3c Mag. X40

Plate 3c is a slide section of ovarian cancer stained in special stain: Periodic acid Schiff Stain(C)

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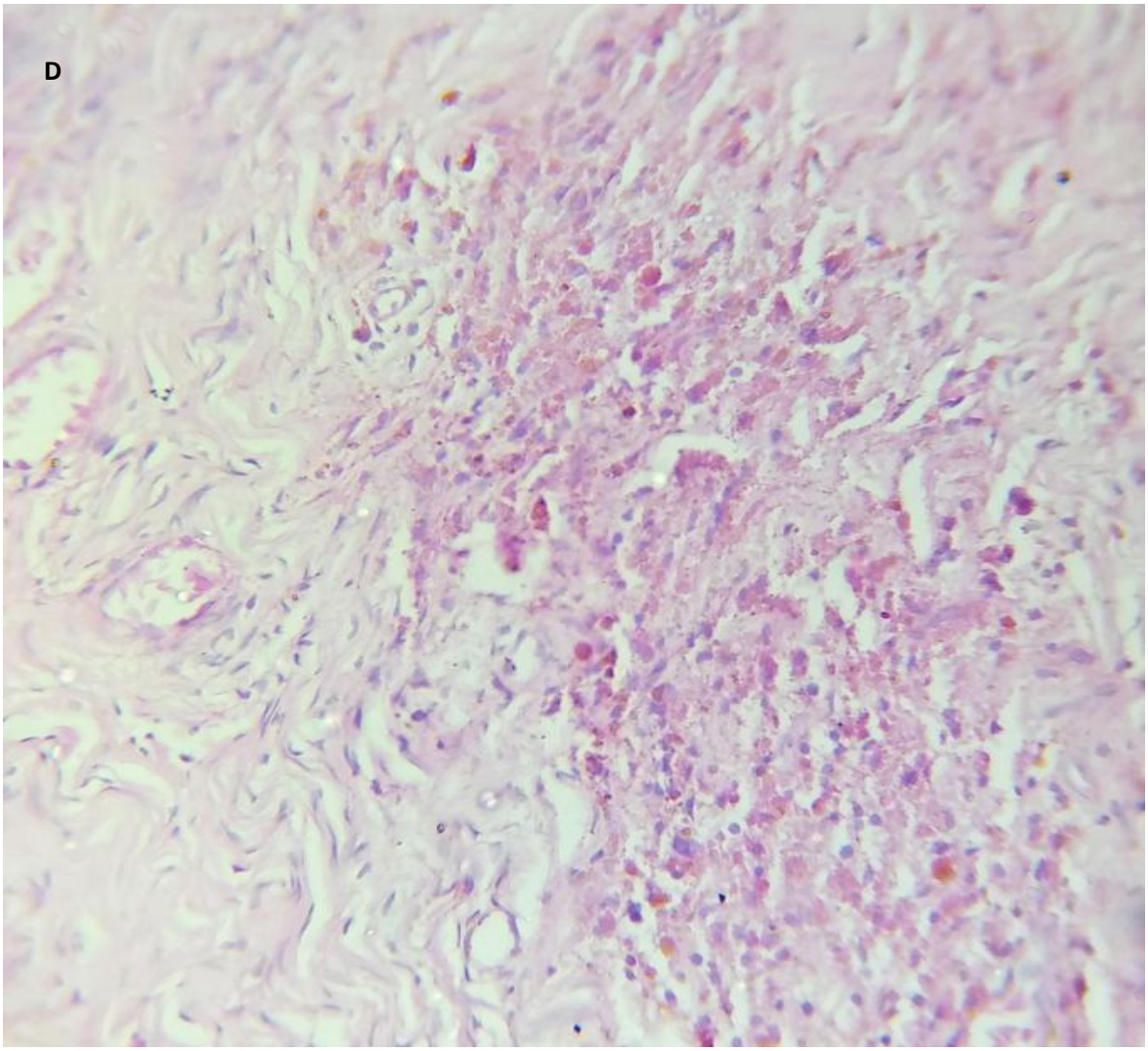

Plate 3d Mag. X40

Plate 3d is a slide section of ovarian cancers stained in routine stain: Van gieson Stain (D),

Results of the analysis of data generated from the study aimed at evaluating the prevalence of ovarian cancer with respect to their physical predisposing factors.

Table 1 show the age related occurrence of benign and malignant tumor at AE-FUTHA between 2016 and 2020. Patients within the ages of 21 and 30 years had the highest occurrence of benign (78) and malignant (7) tumor and those in the age group 61-70 years had the least occurrence of benign tumor (27). Those in the age group 11 and 20 years had no occurrence of malignant tumor. A significant association was observed between age and development of tumor, whether benign or malignant ($p = 0.000$).

In table 2 a significant association was observed between occupation and occurrence of tumor ($p = 0.007$). Single mothers were found to have more chances of developing benign tumor (50) and malignant rumor (19) while civil servant had the least chances of developing benign tumor (15) and the farmer had the least chances of developing malignant tumor (2).

According to marital status in table 3 the singles had the highest chances of developing both benign and malignant tumor (106 and 23 respectively) than others while the divorce has the least chances (15 and 9 respectively). A significant association was observed between marital status and occurrence of tumor ($p = 0.030$)

Table 4 shows the parity related occurrence of benign and malignant tumor. The nulliparous had the highest chances of developing both benign and malignant tumor (126 and 36 respectively) when compared to others. And the grand multipara had the least chances (28 and 5 respectively). The association between parity and occurrence of tumor was statistically non-significant ($p = 0.312$).

In table 5 which shows the educational level related occurrence of benign and malignant tumor, more non former educated patients had the highest occurrence of benign and malignant tumor (89 and 16 respectively while the Ph.D. holder had the least (8 and 0 respectively). A not statistically association was observed between education level and occurrence of tumor ($p = 0.313$.

According to lifestyle, in table 6 the drug users had the highest chances of developing both benign and malignant tumor (35 and 17 respectively) than others while the non-smokers had the least chances (8 and 0 respectively). A non-significant association was observed between marital status and occurrence of tumor (p = 0.0255)

Table 7 shows the occurrence of benign and malignant tumor with respect to other factors including breastfeeding and obesity. The Obese had a higher chances of developing both benign and malignant tumor (80 and 33 respectively) when compared to others.. The association between other factors and occurrence of tumor was statistically not significant (p = 0.086).

Table 1: Age-related occurrence of benign and malignant tumor at AE-FUTHA from 2016

Age (Years)	Number examined	**Benign (%)**	**Malignant**	**x^2-value**	**p-value**
11-20	53	5	3	Nil	59.6790.000
21-30	85	7	8	7	
31-40	76	7	1	0	
41-50	44	2	1	2	
51-60	32	0	1	3	
61-70	71	0	1	7	
Total	311	25	25	9	

to 2020

Table 2: Occurrence of benign and malignant tumor at AE-FUTHA from 2016-2020 according to occupation of the patients

Occupation	Number examined	Benign	Malignant	x^2-value	p-value
Farmer	44	22	19.279	0.007	
Student	50	35	15		
Civil servant	17	15	2		
House wife	50	45	5		
Artisans	19	15	4		
Single mothers	69	50	19		
Industrial workers	28	20	8		
Non industrial workers	43	40	4		

Table 3: Occurrence of benign and malignant tumor at AE-FUTHA from 2016-2020 according to Marital status.

Marital status	Number examined	Benign	Malignant	x^2-value	p-value
Married	119	61	58	9360	.030
Divorced	24	15	9		
Single	129	106	23		
Widow	47	35	12		

Table 4: Occurrence of benign and malignant tumor at AE-FUTHA from 2016-2020 according to Parity

Parity	Number examined	Benign	Malignant	x^2-value	p-value
Nullipara	162	126	36	2.327	0.312
Multi-parity	116	98	18		
Grand multipara	32	28	5		

Table 5: Occurrence of benign and malignant tumor at AE-FUTHA from 2016-2020 according to Educational level

Educational level	Number examined	Benign	Malignant	x^2-value	p-value
No formal education	11	58	92	65.932	0.313
FSLC	7	05	91	1	
SSCE	4	33	7	6	
First degree	5	74	31	4	
Masters	1	81	6	2	
PhD	8	8	Nil		

Table 6: Occurrence of benign and malignant tumor at AE-FUTHA from 2016-2020 according to lifestyle.

Life style	Number examined	Benign	Malignant	x^2-value	p-value
Smokers	46	31	36.567	0.255	
Alcoholic	4	0	3	1	9
Drug users	5	2	3	5	1 7
Non alcoholics	17	1	5	2	
Non smokers	8	8	Nil		
Contraceptives users	2	4	2	1	3

Table 7: Occurrence of benign and malignant tumor at AE-FUTHA from 2016-2020 according to other factors

Other factors	Number examined	Benign	Malignant	x^2-value	p-value
Breastfeeding	2	32	0	3	2.948	0.086
Obesity /weight gain	1	1	18	0	3	3		

DISCUSSION

This study was carried out to determine the occurrence of ovarian cancer among surgical specimens with two considerations; the predisposing physical risk factors and the histological staining diagnosis using special stains. The data analysis reveals a clear and good significance with regards to age, occupation, marital status, parity, educational level, life style, others like breastfeeding and obesity/overweight.

In this study, histological stains like haematoxylin and eosin staining techniques, periodic acid schiff staining technique, silver stain were used to determine and differentiate the benign tumours from malignant. The physical predisposing factors where strongly checked out for from the patients data and the parameters were thus;

As with most cancers the risk of developing ovarian cancer increases as a woman gets older. More than half the cases of ovarian cancer diagnosed are women over 65 years. However, younger women do get ovarian cancer and therefore all women should be aware of the symptoms and risk factors.(ovarian cancer.org). The risk of developing ovarian cancer gets higher with age. Ovarian cancer is rare in women younger than 40. Most ovarian cancers develop after menopause. Half of all ovarian cancers are found in women 63 years of age or older. From the data analysis, the P- value is <0.05 which indicates that the age factor is a significant factor to consider in ovarian cancer development. While the chi-square value shows a close relationship between the age factor in both benign and malignant cases, and as such should be checked upon duly.

This risk factor as analyzed from the data could generally be seen as the P-value <0.05 denoting a significant factor to be considered. No occupation is left out the exposure to a benign condition of ovarian cancer as all due to the origin of the tumour can be predisposed to a benign ovarian tumour. Considering the non- working group under occupation like students, house wives, single mothers and industrial workers have greater possibilities of the benign tumour becoming malignant as they stand a greater chance of getting exposed to environmental factors which could

cause the benign tumour to become malignant. Everyday chemicals are released into the environment by industrial activities which when exposed to can cause the development of ovarian cancer and to an extent such factor if constant exposure to them occurs the benign tumour can further develop into a malignant case. This can be explained the rise in malignancy for industrial, student house wives and single mothers.

The grand multiparous are seen with very low risk of ovarian cancer this interpreted women who have their first full-term pregnancy after age 35 or who never carried a pregnancy to term have a higher risk of ovarian cancer(cancer.org).

Education which brings about enlightenment can best explain itself with regards to why ignorance can result into a greater risk of developing ovarian cancer. Like the saying goes, “my people perish for lack of knowledge”

Smoking doesn’t increase the risk of ovarian cancer overall, but it is linked to an increased risk for the mucinous type.(cancer.org) but with regards to my research, the smoking as a factor is sub- linked to other factors which predisposed the woman to ovarian cancer. Such factors could vary from drugs, to sexual lifestyles which were the major reason for the rise in the value.

Some studies have shown a reduced rate of ovarian cancer in women who ate a diet high in vegetables or a low fat diet, but other studies disagree. Obesity has been linked to a higher risk of developing many cancers (American cancer society, 2016). The current information available for ovarian cancer risk and obesity is not clear. Obese women (those with a body mass index [BMI] of at least 30) have a higher risk of developing ovarian cancer, but not necessarily the most aggressive types, such as high-grade serous cancers. Obesity may also negatively affect the overall survival of a woman with ovarian cancer, as seen from the analysis showing increased possibility of having ovarian cancer. The American Cancer Society recommends following a healthy eating pattern that includes plenty of fruits, vegetables, and whole grains, and that limits or avoids red and processed meats, sugary drinks, and highly processed foods. Even though the effect of these dietary recommendations on ovarian cancer risk remains uncertain, following them can help prevent several other diseases, including some other types of cancer.

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Women who have been pregnant and carried it to term before age 26 have a lower risk of ovarian cancer than women who have not. The risk goes down with each full-term pregnancy. Breastfeeding may lower the risk even further.

Women who have used oral contraceptives (also known as birth control pills or the pill) had a lower risk of ovarian cancer. The risk is lower the longer the pills are used. This lower risk continues for many years after the pill is stopped. Other forms of birth control such as tubal ligation (having fallopian tubes tied) and short use of IUDs (intrauterine devices) have also been associated with a lower risk of ovarian cancer. A hysterectomy (removing the uterus without removing the ovaries) also seems to reduce the risk of getting ovarian cancer by about one-third. As compared to other works from international journal of gynecological cancer on "Frequency and Pattern of Gynecological Cancer in Federal Teaching Hospital Abakaliki" these values obtained are seen to correspond with the findings in this research work

CONCLUSION

Previous studies has suggested the non-influencing factor of smoking to ovarian cancer but this research reveals that most smokers are still with high risk of exposure to ovarian cancer which from my findings it reveals that the risk associated with smokers for ovarian cancer is cross relating with other factors as most smokers and drug addicts as well as their lifestyle is a major predisposing factor. From this research we can then conclude thus cervix carcinoma is the most common female genital tract malignancy in Ebonyi, southeast Nigeria.

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