

RESEARCH ARTICLE

PEER REVIEWED | OPEN ACCESS

Diagnostic spectrum of non-neoplastic ovarian lesions in Nigerians: A seven-year hospital-based retrospective study

Bamnan Collins Dallang, Ijeoma Ahunna Okwudire-Ejeh, Kevin Nwabueze Ezike, Aminu M Mai, Oluseyi A Asaolu, Shiktira D Kwari, Adewunmi Oluseye Adeoye, Emmanuel Eyitayo Oguntebi

ABSTRACT

Aims: Ovarian lesions are an important cause of morbidity and mortality worldwide. They are classified as non-neoplastic, neoplastic, and inflammatory. Non-neoplastic lesions occur most frequently. This study aims to describe the diagnostic spectrum of non-neoplastic ovarian lesions in a Nigerian population and compare their frequency, diagnoses, and clinical presentations with other studies from Nigerian and other regions of the world.

Methods: This was a hospital-based retrospective descriptive study of histologically diagnosed non-neoplastic lesions of the ovary.

Bamnan Collins Dallang¹, Ijeoma Ahunna Okwudire-Ejeh², Kevin Nwabueze Ezike³, Aminu M Mai⁴, Oluseyi A Asaolu⁵, Shiktira D Kwari⁵, Adewunmi Oluseye Adeoye⁶, Emmanuel Eyitayo Oguntebi²

Affiliations: ¹FMCPATH, Lecturer, Department of Anatomic Pathology and Forensic Medicine, Nile University of Nigeria, Abuja, Nigeria; ²FMCPATH, Consultant Pathologist, Department of Anatomic Pathology and Forensic Medicine, Asokoro District Hospital, Abuja, Nigeria; ³FMCPATH, Associate Professor/Head of Department, Department of Anatomic Pathology and Forensic Medicine, Nile University of Nigeria, Abuja, Nigeria; ⁴FWACS (O&G), Associate Professor, Department of Obstetrics and Gynecology, Nile University of Nigeria, Abuja, Nigeria; ⁵FWACS (O&G), Senior Lecturer, Department of Obstetrics and Gynecology, Nile University of Nigeria, Abuja, Nigeria; ⁶FWACP (Lab Med), Consultant Pathologist, Department of Anatomic Pathology, Diagnostic Pathology Consult Ltd, Abuja, Nigeria.

Corresponding Author: Dr. Bamnan Collins Dallang, Department of Anatomic Pathology and Forensic Medicine, Nile University of Nigeria, Abuja, Nigeria; Email: collins.dallang@nileuniversity.edu.ng

Received: 18 January 2025

Accepted: 10 March 2025

Published: 08 April 2025

Results: About 42.8% (295/689) of the ovarian lesions that met the inclusion criteria were non-neoplastic. The age range of the patients was 15–70 years. The median age was 34 years. The 25–34 years age range, 41.0% (121/295), had the highest frequency, while the 55–64 years age range, 0.7% (2/295), was least. Common clinical features included abdominal pain, 81/295 (27.5%), menstrual abnormalities 74/295 (25.1%), and abdominal swelling 67/295 (22.7%). The diagnostic spectrum included cystic, solid, and inflammatory lesions. Corpus luteum cysts, 49.5% (146/295), were the most frequent, followed by follicular cysts, 28.1% (83/295). Polycystic ovary syndrome (PCOS), 0.7% (2/295), was the least encountered cystic lesion. Majority of the specimens, 41.0% (121/295), were small (<5 cm dimension), while the large (>15 cm), 13.9% (41/295), were least frequent.

Conclusion: Non-neoplastic ovarian lesions are an important cause of morbidity in the study population, with corpus luteum cyst as the commonest. Nulliparous and low parity patients were the most frequently affected. Timely and accurate histological recognition of these lesions are important for the purpose of institution of proper treatment.

Keywords: Corpus luteum cyst, Follicular cyst, Nigeria, Non-neoplastic, Ovary

How to cite this article

Dallang BC, Okwudire-Ejeh IA, Ezike KN, Mai AM, Asaolu OA, Kwari SD, Adeoye AO, Oguntebi EE. Diagnostic spectrum of non-neoplastic ovarian lesions in Nigerians: A seven-year hospital-based retrospective study. *Edorium J Gynecol Obstet* 2025;10(1):6–14.

Article ID: 100041Go6BD2025

INTRODUCTION

The ovaries are paired pelvic organs found on either side of the uterus [1]. Embryologically, they arise from both mesodermal (genital ridge) and endodermal (yolk sac) elements [2].

The clinically important ovarian lesions can be generally classified into non-neoplastic and neoplastic conditions [1, 3]. The non-neoplastic lesions predominate, and of these, the most commonly encountered are the non-neoplastic functional cysts [1, 3]. Non-neoplastic cystic lesions of the ovary include inclusion cysts, follicular cysts, cystic follicles, corpus luteum cysts, polycystic ovaries, developmental cysts, and epidermoid cysts [1, 3]. Other commonly encountered non-neoplastic lesions include luteomas of pregnancy, stromal hyperplasia, and hyperthecosis [1, 3].

Generally, the ovarian lesions show a broad spectrum of gross and histomorphological features. However, their clinical significance lies in their association with infertility and tendency to present as mass lesions hence mimicking neoplasms. They are also associated with menstrual abnormalities, and hormonal imbalances, including hirsutism and insulin resistance [4].

This study aims to describe the diagnostic spectrum of non-neoplastic ovarian lesions in a Nigerian population as seen in Asokoro District Hospital, Abuja, and compare their frequency distribution, lesion types, and clinical presentations with findings from other Nigerian studies and studies from other regions of the world. It is also hoped that this study, being the first of its kind to be carried out in this center, will help in the establishment of baseline data for health systems planning, especially in terms of infrastructural development, equipment prioritization, and resource deployment.

MATERIALS AND METHODS

Setting

Asokoro District Hospital (ADH) is located in Abuja, the capital city of Nigeria. The hospital is a tertiary referral center in Abuja and its Anatomic Pathology and Forensic Medicine Department receives an average of 2500 specimens annually.

Study Design

This was a hospital-based retrospective descriptive study of histologically diagnosed non-neoplastic lesions of the ovary. The study population included all cases with histologically diagnosed non-neoplastic lesions of the ovary at the histopathology department of ADH within the period of study (January 1, 2016 to December 31,

2022). Samples were obtained from ovarian cystectomies, oophorectomies, total abdominal hysterectomy and bilateral salpingo-oophorectomy specimens, and excision biopsies submitted to the ADH anatomic pathology and forensic medicine department from January 1, 2016 to December 31, 2022.

The patients' demographic information and other clinical data were obtained from the departmental manual and hospital electronic records. Archival formalin fixed and paraffin embedded (FFPE) tissue blocks, and hematoxylin and eosin (H&E) stained slides of histologically diagnosed ovarian lesions were retrieved. Slides with poor or deteriorated quality were replaced by making fresh, 3 µm thick sections from the archival tissue blocks, and stained with H&E. All the slides thus obtained were subsequently reviewed by all four pathologists in the study to confirm by consensus, the diagnoses and other relevant morphological features.

Inclusion and Exclusion Criteria

Inclusion criteria

Cases with complete demographic data and those with adequately informative glass slides available were selected for the study. Cases where the slides were not found, but for which their FFPE tissue blocks were found, and therefore had new H&E slides produced were also selected.

Exclusion criteria

Cases with incomplete demographic data, and those where both glass slides and FFPE tissue blocks were not found, were excluded from the study. Cases for which there was no diagnostic consensus among the reviewing pathologists were also excluded.

Diagnostic Criteria

Gross specimen size was categorized according to their widest dimensions as follows:

- <5 cm = Small
- 5–9.9 cm = Medium
- 10–14.9 cm = Large
- ≥14.9 cm = Giant

Statistical Analysis

Data obtained were analyzed using analytical tools including Microsoft Excel software program (Microsoft Corporation, NY, USA) and analyzed with the Statistical Package for the Social Sciences (SPSS) Statistics for Windows, version 23.0 (SPSS Inc., Chicago, IL, USA). The data were presented in the form of tables and charts.

Ethical Consideration

Ethical clearance was obtained from the Medical Ethics Committee of Asokoro District Hospital via approval number: FCTA/HHSS/HMB/ADH/104/23.

RESULTS

A total of 689 ovarian samples received within the study period met the inclusion criteria. Of these, 42.8% (295/689) were non-neoplastic lesions, while 40.9% (282/689) were neoplastic lesions (Figure 1).

The age distribution of the non-neoplastic conditions showed an age range of 15–70 years. The mean age was 35.6 ± 6.5 years while the median age was 34 years. The most frequent age group in which these lesions were diagnosed was the 25–34 years age group, who accounted for 41.0% (121/295), while the least was the 55–64 years age group with 0.7% (2/295) of cases (Figure 2).

Data on parity were available for 143/295 of cases. It showed that non-neoplastic lesions of the ovary were commoner in women who were either nulliparous 61/143 (42.7%) or of relatively low parity 55/143 (38.5%), as compared to women of parity greater than three 27/143 (18.9%).

The frequently encountered clinical features recorded include abdominal pain 81/295 (27.5%), menstrual abnormalities 74/295 (25.1%), and abdominal swelling 67/295 (22.7%).

The diagnostic spectrum of the non-neoplastic lesions included cystic, solid, and inflammatory lesions. Corpus luteum cyst was the most frequently diagnosed, accounting for 49.5% (146/295) of cases, followed by follicular cyst, accounting for 28.1% (83/295). Polycystic ovary syndrome (PCOS) with 2 cases (0.7%) was the least encountered cystic lesion. Inflammatory conditions accounted for 3.1% (9/295) of diagnoses, and an overwhelming majority of these 88.9% (8/9) were ovarian abscesses; the only other diagnosis was a case of granulomatous inflammation in a 30-year-old patient (Table 1, Figure 3). The relationship between age and the various non-neoplastic disorders was statistically significant. A significant majority of corpus luteum cysts 85.6% (125/146) occurred in patients within the reproductive age range of 15–44 years. The age distribution of follicular cysts followed a similar pattern, occurring predominantly in the 15–44 years age range with a frequency of 79.5% (66/83) (Table 2).

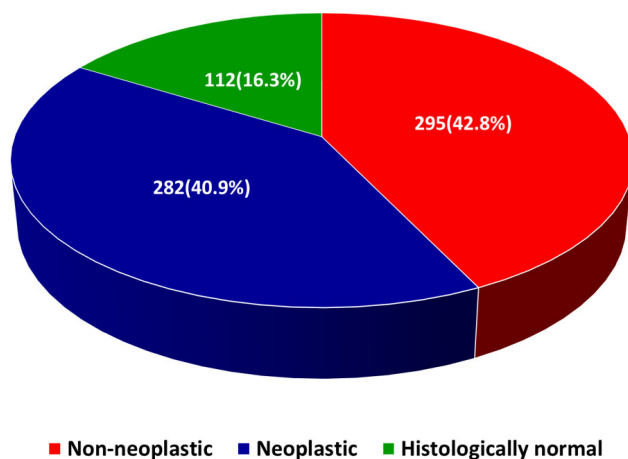


Figure 1: Diagnostic categories of ovarian lesions.

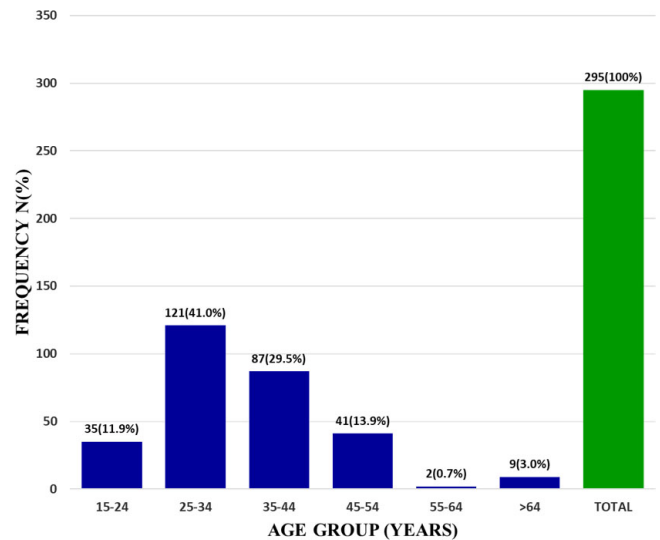


Figure 2: Age distribution of non-neoplastic lesions of the ovary.

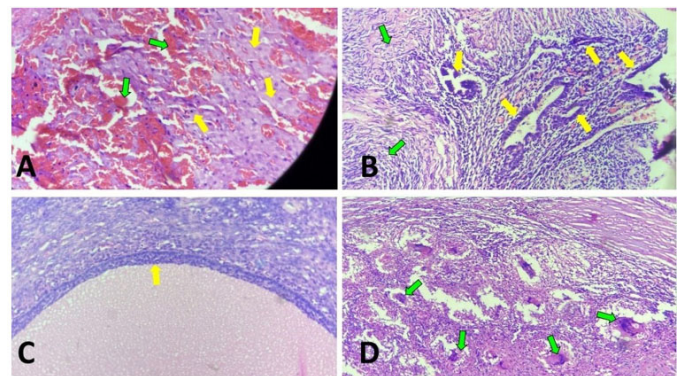


Figure 3: Photomicrographs of selected non-neoplastic lesions of the ovary (H&E $\times 200$). (A) Corpus luteum cyst. Note multiple layers luteinized granulosa and theca cells (yellow arrows) and areas of hemorrhage (green arrows). (B) Endometriosis. Note foci of benign endometrial-type glands (yellow arrows) surrounded by endometrial-type stroma. The cellular fibroblastic ovarian stroma is seen at the bottom left corner of the micrograph (green arrow). (C) Follicular cyst. Note lining by an inner layer of granulosa cells (yellow arrow) and an outer layer of theca cells. The lumen contains eosinophilic fluid material. (D) Granulomatous inflammation. Note granulomas comprised of aggregates of epithelioid macrophages and multinucleated inflammatory giant cells (green arrows), surrounded by lymphoplasmacytic cells and fibroblasts.

Morphologically, majority, 55.5% (81/146), of the corpus luteum cysts were hemorrhagic but none of them was associated with torsion, while on the other hand, although only 8.4% (7/83) of follicular cysts were hemorrhagic, 4 out of the 7 (57.1%) were associated with torsion. A case of follicular cyst with hemorrhagic necrosis and degenerative osseous metaplasia was seen in a 21-year-old. All the endometriotic cysts seen were associated with increased fibrosis, hemorrhage, and presence hemosiderin laden macrophages.

In terms of gross specimen size, small lesions (i.e., those that measured less than 5 cm in their greatest dimension) with 41.0% (121/295) of cases, predominated, while giant non-lesions (with largest dimension greater than 15 cm) were the least frequent with 13.9% (41/295) of cases (Table 3). The relationship between gross specimen size and the commonly encountered clinical features of abdominal pain, menstrual abnormalities, and abdominal swelling was not statistically significant. Of the 81 cases in which abdominal pain was encountered, the highest frequency of 34.6% (28/81) occurred in patients whose lesions measured less than 5 cm in greatest dimension.

These findings were similar for menstrual abnormalities and abdominal swelling, with frequencies of 50.0% (37/74) and 29/67 (43.3%) for lesions measuring less than 5 cm in greatest dimension. In contrast, the relationship between gross specimen size and patients' age was statistically significant. Patients in the early reproductive age range of 15–24 years had a preponderance of large and giant size lesions, 54.8% (17/31). In contrast, patients in the peri- and postmenopausal age ranges of 45 years and above had a much higher proportion, 79.1% (34/43), of small- and medium-sized lesions (Table 4).

Table 1: Diagnostic spectrum of non-neoplastic lesions of the ovary.

Diagnoses	Frequency (n=295)	Percent
Corpus luteum cyst	146	49.5
Follicular cyst	83	28.1
Endometriosis	26	8.8
Cystic follicle	16	5.4
Benign ovarian cyst	9	3.1
Abscess	8	2.7
Pregnancy luteoma	2	0.7
PCOS	2	0.7
Chronic granulomatous inflammation	1	0.3
Blood clot	1	0.3
Ectopic gestation	1	0.3

Table 2: Age distribution of non-neoplastic lesions

Non-neoplastic lesions	Age range (years)						X ²	p-value
	15–24 n (%)	25–34 n (%)	35–44 n (%)	45–54 n (%)	55–64 n (%)	>64 n (%)		
Corpus luteum cyst	18 (6.1)	63 (21.4)	44 (14.9)	21 (7.1)	0 (0.0)	0 (0.0)	96.970	<0.001*
Follicular cyst	13 (4.4)	30 (10.2)	23 (7.8)	15 (5.1)	2 (0.7)	0 (0.0)		
Endometriosis	4 (1.4)	18 (4.4)	4 (1.4)	0 (0.0)	0 (0.0)	5 (1.7)		
Cystic follicle	0 (0.0)	5 (1.7)	8 (2.7)	3 (1.0)	0 (0.0)	0 (0.0)		
Benign Ovarian cyst	0 (0.0)	3 (1.0)	5 (1.7)	1 (0.3)	0 (0.0)	2 (0.7)		
Abscess	0 (0.0)	4 (1.4)	3 (1.0)	1 (0.3)	0 (0.0)	0 (0.0)		
Pregnancy luteoma	0 (0.0)	1 (0.3)	1 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)		
PCOS	0 (0.0)	1 (0.3)	1 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)		
Chronic granulomatous inflammation	0 (0.0)	1 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.3)		
Blood clot	0 (0.0)	0 (0.0)	1 (0.3)	0 (0.0)	0 (0.0)	1 (0.3)		
Ectopic gestation	0 (0.0)	1 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)		

*Significant at 95%; X² Chi-square test statistic.

Table 3: Gross specimen sizes of non-neoplastic lesions of the ovary

Size	Frequency (N=295)	Percent
<5	121	41.0
5–9.9	69	23.4
10–14.9	42	14.2
>14.9	41	13.9
No data	22	7.5

Table 4: Age distribution of gross specimen size

Age range (years)	Gross size (cm)				X ²	p-value
	<5 n (%)	5–9.9 n (%)	10–14.9 n (%)	>14.9 n (%)		
15–24	8 (25.8)	6 (19.4)	8 (25.8)	9 (29.0)	41.358	<0.001*
25–34	53 (46.9)	24 (21.2)	16 (14.2)	20 (17.7)		
35–44	37 (43.0)	28 (32.6)	18 (20.9)	3 (3.5)		
45–54	17 (50.0)	8 (23.5)	0 (0.0)	9 (26.5)		
55–64	0 (0.0)	2 (100.0)	0 (0.0)	0 (0.0)		
>64	6 (85.7)	1 (14.3)	0 (0.0)	0 (0.0)		

*Significant at 95%; X² Chi-square test statistic.

DISCUSSION

Non-neoplastic lesions of the ovary constituted the majority of the ovarian samples obtained in this study, accounting for 42.8%. This is similar to trends obtainable in other parts of the world [1, 3, 5]. Some Nigerian studies carried out at Abuja and Benin also had similar findings [6, 7]. An Indian study by Gupta et al. which looked at ovarian masses in adolescents, as well as some other studies in the same region, also found non-neoplastic lesions to be the most frequent [5, 8–11]. Functional cysts are known to be the commonest non-neoplastic lesions of the ovary [1, 3]. Consistent with this, we found corpus luteum cyst (49.5%) to be the commonest non-neoplastic lesion. Nigeria-based studies by Forae et al. and Innocent et al., in Benin and Jos respectively, also found corpus luteum cyst to be the commonest non-neoplastic lesion of the ovary [7, 12]. Follicular cyst was the second commonest non-neoplastic ovarian lesion seen in this study, accounting for 28.4% of these lesions. In contrast, an earlier study in Abuja, Nigeria, by Amin et al., found follicular cyst and corpus luteum cyst to be the most common and third commonest non-neoplastic lesions of the ovary respectively [6]. The reasons for this disparity are unclear but may be related to study methodology and differences in diagnostic criteria. Nevertheless, the etiology of these functional cysts being from physiological structures and processes, as well as their functional nature, underpins their common occurrence and their propensity for spontaneous resolution [1, 13–15]. They may however persist and attain significantly large sizes, enough to cause abdominal symptoms, or possibly

rupture leading to life-threatening clinical conditions [13–15].

Even though non-neoplastic lesions of the ovary occurred over a wide age range of 15–70 years in this study, they were found to be most common in women in the 25–34 years age group and least common in post-menopausal women. This is similar to the age distribution seen in some studies around the world [7, 16]. The mean and median ages in this study (35.6±6.5 years and 34 years respectively) were similar to what was obtained in studies by Forae et al., Innocent et al., and Jones et al. [7, 12, 17]. This pattern of age distribution may be the result of greater exposure to physiological cyclical hormones in women that fall within the reproductive age group [1]. Further buttressing this, our finding that these lesions were commoner in nulliparous and low-parity patients underscores the contribution of hormonal exposure and uninterrupted menstrual cycles to the development of some of these lesions [1]. Other etiological factors include infertility treatment (with gonadotropins or other ovulation induction agents), tamoxifen, pregnancy, hypothyroidism, maternal gonadotropins, cigarette smoking, and tubal ligation [18, 19].

Similar to findings in other studies, a good number of our patients were asymptomatic, however, we also found abdominal pain to be a frequent clinical symptom [16, 18, 19]. The relationship between the size of a non-neoplastic ovarian lesion and its ability to elicit abdominal pain symptom is not straightforward, and depends on factors such as nature of the lesion, whether or not it is ruptured or infected or has undergone torsion and the patient's pain threshold [16, 18]. For instance, patients with

small endometriotic cysts often complain of cyclical pain while some may have follicular cysts that grow to relatively large sizes without experiencing abdominal pain [13, 20]. Perhaps, as a result of these factors, our study found no direct relationship between size and abdominal pain. Another clinical feature commonly encountered in this study; menstrual disturbances, also had no direct relationship with the size of the lesions. Menstrual abnormalities are a common feature of ovarian pathologies such as PCOS and pelvic inflammatory disease (PID) [21, 22]. Follicular cysts may be associated with endometrial hyperplasia and consequently, abnormal vaginal bleeding [13]. The likelihood of a non-neoplastic ovarian lesion causing abdominal swelling increases with the size of that lesion [23, 24]. However, our study did not demonstrate this relationship. The reasons for this are unclear but insufficient clinical details arising from lack of thoroughness in clerking and physical examination or laziness in entering these details in the electronic medical records by the clinician may be factors.

Our study found an inverse relationship between patients' age and size of lesions, especially the cystic lesions. There is however no consensus on these as different studies report varying conclusions. Some, like Grigore et al., found no significant correlation between age and lesion size, while in keeping with our findings, Khan et al. reported an inverse relationship [25, 26]. One possible explanation is that these lesions occur more frequently in the reproductive years due to higher levels of hormone production by the ovaries in this age group [18]. Overall, most of the non-neoplastic ovarian lesions seen in this study were small, despite the common trend of small ovarian lesions being likely to resolve with conservative management and much less frequently requiring surgical intervention on account of large sizes [27, 28]. The differential diagnoses of these non-neoplastic ovarian lesions include other conditions, such as pelvic inflammatory disease, appendicitis, bowel obstruction, and rarer entities like gossypiboma, mesenteric cysts, or parasitic ovarian cysts, as all these conditions can present with non-specific symptoms like abdominal pain [24, 29].

Limitations of the Study

The major limitation of the study was that it was hospital-based and therefore analyzed only the cases that underwent surgical excision. As a result, the findings may not reflect the true prevalence and incidence of non-neoplastic lesions of the ovary within the population. Another limitation is the retrospective nature of the study design, which was associated with incomplete data, especially parity, with possible distortion of the rendered statistics. Inadequate storage facilities and retrieval of archival material also contributed to the inability to obtain some patient materials leading to exclusion from the study.

CONCLUSION

This study established that non-neoplastic ovarian lesions are an important cause of morbidity in the study population. It also demonstrated non-neoplastic lesions as the commonest conditions affecting the ovaries, and that corpus luteum cyst was the commonest of these lesions. These non-neoplastic lesions were found to be more common in women in the reproductive age group, especially nulliparous women and low parity women. Conversely, they were less common in post-menopausal and multiparous women. Their symptomatology was non-specific; hence, a high index of suspicion is required in the evaluation of these lesions. Aforementioned conditions, such as pelvic inflammatory disease, appendicitis, bowel obstruction, should also be considered in the differential diagnoses, along with rarer entities like gossypiboma, mesenteric cysts, or parasitic ovarian cysts, as all these conditions often present with similar non-specific symptoms like abdominal pain. Their overlapping clinical features highlight the importance of thorough imaging and histological examination for accurate diagnosis and timely management.

Acknowledgments

The authors wish to thank Mr. Alex Adeyemo, data analyst and statistician with the University of Abuja, Gwagwalada, Abuja, Nigeria, for his assistance with the data analysis. All relevant data are available upon reasonable request.

Author Contributions

Bamnan Collins Dallang – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Ijeoma Ahunna Okwudire-Ejeh – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Kevin Nwabueze Ezike – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part

of the work are appropriately investigated and resolved

Aminu M Mai – Analysis of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Oluseyi A Asaolu – Acquisition of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Shiktira D Kwari – Acquisition of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Adewunmi Oluseye Adeoye – Analysis of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Emmanuel Eytayo Oguntebi – Acquisition of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Guarantor of Submission

The corresponding author is the guarantor of submission.

Source of Support

None.

Consent Statement

Written informed consent was obtained from the patient for publication of this article.

Conflict of Interest

Authors declare no conflict of interest.

Data Availability

All relevant data are within the paper and its Supporting Information files.

Copyright

© 2025 Bamnan Collins Dallang et al. This article is distributed under the terms of Creative Commons

Attribution License which permits unrestricted use, distribution and reproduction in any medium provided the original author(s) and original publisher are properly credited. Please see the copyright policy on the journal website for more information.

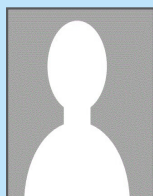
REFERENCES

1. Gilks B. Ovary. In: Goldblum JR, Lamps LW, McKenney JK, Myers JL, editors. Rosai and Ackerman's Surgical Pathology. 11ed. Philadelphia: Elsevier; 2011. p. 1367–431.
2. Atwi D, Ghofrani M, Hassell LA. Anatomy & histology. PathologyOutlines.com [Available at: <https://www.pathologyoutlines.com/topic/ovarynontumornormalhistology.html>]
3. Ellenson LH, Pirog EC. Female genital tract. In: Kumar V, Abul KA, John CA, editors. Robbins and Cotran Pathologic Basis of Disease 9ed. Philadelphia: Elsevier; 2014. p. 986–1036.
4. Lengyel K, Hanley K. Polycystic ovary disease. PathologyOutlines.com [Available at: <https://www.pathologyoutlines.com/topic/ovaryPCO.html>]
5. Wills V, Mathew R. A study on clinico-histopathological patterns of ovarian tumors. International Journal of Reproduction, Contraception, Obstetrics and Gynecology 2016;5(8):2666–71.
6. Amin SM, Olah F, Babandi RM, Liman MI, Abubakar SJ. Histopathological analysis and clinical correlations of ovarian lesions in a tertiary hospital in Nigeria: A 10-year review. Ann Trop Pathol 2017;8(6):25–8.
7. Forae GD, Aligbe JU. A histopathological overview of ovarian lesions in Benin City, Nigeria: How common are the functional cysts? Int J Med Public Health 2014;4(3):265–8.
8. Gupta B, Guleria K, Suneja A, Vaid NB, Rajaram S, Wadhwa N. Adolescent ovarian masses: A retrospective analysis. J Obstet Gynaecol 2016;36(4):515–7.
9. Maurya G, Singh SK, Pandey P, Chaturvedi V. Pattern of neoplastic and non-neoplastic lesions of ovary: A five-year study in a tertiary care centre of rural India. Int J Res Med Sci 2018;6(7):2418–22.
10. Radadiya S, Soni P, Gangani P, Rathod H, Resident J. Histopathological study of non-neoplastic and neoplastic ovarian lesions. International Journal of Pharmaceutical and Clinical Research 2024;16(9):1056–61.
11. Hatwal D, Choudhari S, Batra N, Bhatt P, Bhatt S. Clinico-histopathological analysis of neoplastic and non-neoplastic lesion of ovary in Garhwal region of Uttarakhand: A 4-year study at tertiary level hospital. Indian Journal of Pathology and Oncology 2016;3(2):133–40.
12. Emmanuel I, Abobarin O, Abaniwo S, et al. A clinicopathological study of 236 cystic ovarian lesions at Jos University Teaching Hospital, Jos, Nigeria. Niger Med J 2022;62(6):360–4.
13. Turashvili G. Follicle cyst. PathologyOutlines.com [Available at: <https://www.pathologyoutlines.com/topic/ovarynontumorfollicularcysts.html>]
14. Busca A, Parra-Herran C. Corpus luteum cyst. PathologyOutlines.com [Available at:

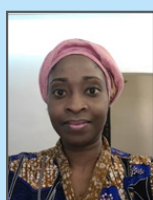
- <https://www.pathologyoutlines.com/topic/ovarynontumorcypustlucyst.html>]
15. Abbas AM, Amin MT, Tolba SM, Ali MK. Hemorrhagic ovarian cysts: Clinical and sonographic correlation with the management options. *Middle East Fertility Society Journal* 2016;21(1):41–5.
 16. Abduljabbar HS, Bukhari YA, Al Hachim EG, et al. Review of 244 cases of ovarian cysts. *Saudi Med J* 2015;36(7):834–8.
 17. Jones KD. The prevalence and age distribution of ovarian cysts among women attending a London teaching hospital. *J Obstet Gynaecol* 2001;21(1):70–1.
 18. Mobeen S, Apostol R. Ovarian Cyst. In: *StatPearls*. Treasure Island (FL): StatPearls Publishing; 2025.
 19. Mukta SA, Islam S, Akter S, Rikta SA. Prevalence and risk factors of ovarian cysts in women aged 18–45 years in bangladesh: A prospective study on ovarian cyst development and carcinoma risk. *Asian Research Journal of Gynaecology and Obstetrics* 2023;6(1):221–6.
 20. Hoyle AT, Puckett Y. Endometrioma. In: *StatPearls*. Treasure Island (FL): StatPearls Publishing; 2025.
 21. Teede H, Deeks A, Moran L. Polycystic ovary syndrome: A complex condition with psychological, reproductive and metabolic manifestations that impacts on health across the lifespan. *BMC Med* 2010;8:41.
 22. Venturoli S, Porcu E, Fabbri R, et al. Menstrual irregularities in adolescents: Hormonal pattern and ovarian morphology. *Horm Res* 1986;24(4):269–79.
 23. Overview: Ovarian cysts [Internet]. United States of America: National Library of Medicine; National Center for Biotechnology Information; 2022 [cited 2025 March 3]. [Available at: <https://www.ncbi.nlm.nih.gov/books/NBK539572>]
 24. Madill M, Grabosch SM. Ovarian cyst [Internet]. Medscape; 2023. [Available at: <https://emedicine.medscape.com/article/255865-overview?form=fpf>]
 25. Grigore M, Murarasu M, Himiniuc LM, Toma BF, Duma O, Popovici R. Large ovarian tumors in adolescents, a systematic review of reported cases, diagnostic findings and surgical management. *Taiwan J Obstet Gynecol* 2021;60(4):602–8.
 26. Khan N, Afroz N, Aqil B, Khan T, Ahmad I. Neoplastic and nonneoplastic ovarian masses: Diagnosis on cytology. *J Cytol* 2009;26(4):129–33.
 27. Kanizsai B, Orley J, Szigetvári I, Doszpod J. Ovarian cysts in children and adolescents: Their occurrence, behavior, and management. *J Pediatr Adolesc Gynecol* 1998;11(2):85–8.
 28. Winata IGS, Sabatini EP, Purnomo FS. Diagnosis and treatment of benign ovarian tumors. *European Journal of Medical and Health Sciences* 2022;4(2):1–3.
 29. Kanani J, Sheikh MI. Undiagnosed, uncomplicated foreign body in abdominal cavity – A case of medical negligence. *Surgery Case Reports* 2024;2:100024.

ABOUT THE AUTHORS

Article citation: Dallang BC, Okwudire-Ejeh IA, Ezike KN, Mai AM, Asaolu OA, Kwari SD, Adeoye AO, Oguntebi EE. Diagnostic spectrum of non-neoplastic ovarian lesions in Nigerians: A seven-year hospital-based retrospective study. *Edorium J Gynecol Obstet* 2025;10(1):6–14.



Bamnan Collins Dallang is a Lecturer in Anatomic Pathology at Nile University of Nigeria, Abuja, Nigeria. He earned the undergraduate degree MBBS from the College of Medicine, University of Jos, Jos, Plateau State, Nigeria; and postgraduate fellowship in Anatomic Pathology (FMCPPath) from the National Postgraduate Medical College of Nigeria. He has published six research papers in national and international academic journals. His research interests include prostate and gynecologic pathology. Email: collins.dallang@nileuniversity.edu.ng



Ijeoma Ahunna Okwudire-Ejeh is a Consultant Pathologist at Asokoro District Hospital, FCT, Abuja, Nigeria. She earned her Bachelor of Medicine, Bachelor of Surgery (MBBS) degree in 2006 from the University of Jos, Jos, Plateau State, Nigeria, and obtained the Fellowship of the National Postgraduate Medical College of Nigeria in anatomic pathology (FMCPPath) in 2018. She has published more than 20 peer reviewed articles in both national and international journals. Her research interests include cytopathology, breast and gynecologic pathology, and neuropathology. She intends to pursue a post specialty fellowship in the future. Email: okwudireejehijeoma@gmail.com



Kevin Nwabueze Ezike is an Associate Professor of anatomic pathology at Nile University of Nigeria, Abuja, Nigeria. He graduated with an MBBS from University of Nigeria, Nsukka, in 1991, and obtained the Fellowship (FMCPPath) in Anatomic Pathology from the National Postgraduate Medical College of Nigeria in 2008. He has vast experience in histopathology, cytopathology, autopsy pathology, academics and research spanning 20 years and 3 universities. Dr. Ezike is a versatile researcher and his research interests include breast, prostate, gynecological, and gastrointestinal system pathology. He has published more than 30 peer reviewed articles in both national and international journals. Email: kevin.ezike@nileuniversity.edu.ng



Aminu Mai is an Associate Professor of Obstetrics & Gynecology in Nile University of Nigeria, Abuja, Nigeria. He obtained his Bachelor of Medicine, Bachelor of Surgery (MBBS) degree from the College of Medicine, University of Maiduguri, Nigeria in 1983 and Fellowship of the West African College of Surgeons (FWACS) in 1991 from the University of Benin Teaching Hospital, Benin City, Nigeria. He has published more than 20 articles in peer reviewed local and international journals including a chapter in a textbook for health workers in developing countries. His research interests are in reproductive health, fetal-maternal medicine, and infertility.

Email: aminu.mai@nileuniversity.edu.ng



Oluseyi Ayoola Asaolu is a Lecturer in Obstetrics and Gynecology at Nile University Abuja and Chief Consultant Obstetrician and Gynecologist in Wuse District Hospital, Abuja, Nigeria. He earned the MBChB degree from Obafemi Awolowo University, Ile Ife, Nigeria and his postgraduate degree (FWACS) from Obafemi Awolowo Teaching Hospital Complex, Ile Ife, Nigeria. He has a fellowship in Minimal Access Surgery (FMAS) from World Laparoscopic Hospital, India. He has six peer reviewed research papers in national and international academic journals. He authored a chapter in a book.

His research interests include minimal access surgery, in-vitro fertilization, and gynecologic oncology.

Email: medicareconsult@yahoo.com



Shiktira Danladi Kwari is a Chief Consultant Obstetrician and Gynecologist, and a Senior Lecturer in Asokoro District Hospital Abuja and Nile University of Nigeria, Abuja, Nigeria. She earned the undergraduate degree MBBS from the University of Maiduguri, Maiduguri, Borno State, Nigeria, and Fellowship of the West African College of Surgeons (FWACS) from the University of Maiduguri Teaching Hospital, Maiduguri, Borno State, Nigeria. She has published seventeen (17) research papers in in peer reviewed national and international journals. Her research interests include fetomaternal medicine, endocrinology, and gynecologic oncology.

Email: kwarydan@yahoo.com



Adewunmi Oluseye Adeoye is Consultant Pathologist at Diagnostic Pathology Consult Ltd in Abuja, Nigeria. He obtained the MBChB degree from Obafemi Awolowo University Ile-Ife, Nigeria in 1997, and the Fellowship of the West African College of Physicians [FWACS (Lab Med)] in 2007 and a postdoctoral certificate in Molecular Oncologic Pathology at the University of Toronto and University Health Network's Princess Margaret Cancer Centre in Toronto in 2014. He has published over 30 peer reviewed articles in national and international academic journals. His research interests include cancer research, medical education, digital pathology, and telepathology.

Email: wunmiadeoye@gmail.com



Emmanuel Eyitayo Oguntebi is a Consultant Anatomic Pathologist at Asokoro District Hospital, Abuja, FCT, Nigeria. He earned his undergraduate MBBS degree, from the University of Ilorin, Ilorin, Kwara State, Nigeria and postgraduate degree FMCPATH from National Postgraduate Medical College of Nigeria, Nigeria. He has published 9 research papers in national and international academic journals. His research interests include prostate cancer epidemiology, molecular biology of breast, and gynecological cancers. He intends to pursue the further studies in the concept of cancer etiopathogenesis in Africans.

Email: emmanueloguntebi425@gmail.com

Access full text article on
other devices



Access PDF of article on
other devices



