Original Article

Histopathological Spectrum of Benign Breast Lesions in Makurdi, North-Central Nigeria: A 10-Year Retrospective Study

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ABSTRACT

Benign breast lesions (BBLs) represent the majority of breast pathologies globally, yet their epidemiological profiles vary by region. In Sub-Saharan Africa, understanding these patterns is crucial for effective clinical management and allocation of resources. This study provides a 10-year update on the histopathological spectrum of BBLs in Makurdi, North-Central Nigeria. This was a retrospective, descriptive study utilising histopathology records of breast biopsies and excisions performed at the Federal Medical Centre, Makurdi, from January 1, 2014, to December 31, 2023. Data on patient age, sex, and definitive histological diagnosis of benign breast lesions were extracted and analysed using descriptive statistics. A total of 432 histologically confirmed benign breast lesions were identified. The majority (98%) occurred in females, with only 2% in males (predominantly gynaecomastia). Fibroadenoma was the most prevalent BBL, accounting for 337 cases (78.01%). Its mean age of occurrence was 23.4 years, with peak incidence in the 10-20 (148 cases) and 21-30 (121 cases) age groups. Fibrocystic disease was the second most common, with 46 cases (10.65%), having a mean age of 33.3 years. Other identified lesions included ductal ectasia (4.86%, n mean age 41.2 years) and various inflammatory lesions. Fibroadenoma remains the predominant benign breast lesion in Makurdi, consistent with regional and global trends, primarily affecting young women. Fibrocystic disease is the second most common. These findings highlight the need for continued public health awareness and accurate diagnostic strategies to manage breast lumps in the region effectively.

Keywords: Benign breast lesions, Fibroadenoma, Fibrocystic disease, Histopathology.

INTRODUCTION

Benign breast lesions (BBLs) constitute a heterogeneous group of non-malignant disorders representing the most common breast pathology encountered worldwide[1]. While not life-threatening like breast cancer, they impose a significant healthcare burden and cause considerable patient anxiety due to diagnostic uncertainty and the need for differentiation from malignancy[1,2]. Understanding their histopathological distribution and prevalence within specific populations is crucial for accurate diagnosis, appropriate clinical management, resource allocation, and establishing regional epidemiological baselines.[2],[3] This is particularly vital in resource-limited settings like sub-Saharan Africa (SSA), where diagnostic infrastructure can be constrained, and cultural factors may delay presentation[3,4].

Globally, fibroadenoma consistently dominates BBL diagnoses, followed by fibrocystic changes and

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other entities like adenosis and phyllodes tumours[1,5]. However, significant geographical and ethnic variations exist. Within SSA, studies consistently report a high burden of BBLs, often presenting at younger ages compared to Western populations, with fibroadenoma overwhelmingly predominant[3,4,6]. Nigerian studies largely reflect this SSA trend but also reveal potential regional variations within the country[7,8]. Research from South-Western Nigeria (e.g., Ibadan, Lagos) and Northern Nigeria (e.g., Kano, Sokoto) underscores fibroadenoma's prevalence but highlights differences in the relative frequencies of other lesions like fibrocystic change and inflammatory conditions[7-10]. Comprehensive histopathological data specifically from the North-Central region, including Benue State and its capital, Makurdi, have been done; so this study is to have an update [11].

This 10-year retrospective study aims to characterise the histopathological spectrum and relative frequencies of benign breast lesions diagnosed at pathology laboratories serving Makurdi, North-Central Nigeria. By providing detailed, population-specific data, this research seeks to fill a critical regional knowledge gap. The findings are expected to enhance local clinical decision-making, guide public health interventions focused on breast health awareness, and contribute valuable comparative data to the broader understanding of breast disease epidemiology in Nigeria and SSA, where such region-specific insights are essential for optimising healthcare delivery.

MATERIALS AND METHODS

This was a 10-year retrospective study in archival records of the Benue State University Teaching Hospital (BSUTH), Makurdi Department of Anatomic Pathology. The study period covered ten years from the 1st of March 2016 to February, 28st 2025. In a few cases of missing records of diagnosis, frozen sections were obtained from the formalin-fixed paraffin-embedded tissue blocks and stained with heamatoxyln and eosin. The demographic information was extracted from the request forms and histology reports, which include: age, sex, nature of the specimen, hospital number and histopathological diagnosis. The collated data were analysed using tables and charts. Institutional ethical clearance was obtained for the use of anonymised registry data.

RESULTS

Female patients with benign breast lesions accounted for 97.22% (420/432) of cases, reflecting the higher prevalence of breast lesions in women. Male patients with benign breast lesions represent only 2.78% (12/432), with lesions like gynecomastia (0.93%, n=4) and nipple adenoma (0.23%, n=1) exclusively male. Rare male cases of fibroadenoma (1%, n-5) and fibrocystic disease (1%,n=4) suggest atypical presentations or diagnostic nuances (Figure 1 and Tables 1 and 2).

Fibroadenoma predominates 78.01% (337/432), typical of younger females (mean age 23.4 years), with 80.71% (272/337) occurring in ages 10–30. This aligns with global patterns of fibroadenoma prevalence in reproductive-aged women. Fibrocystic Disease 10.65% (46/432) is the second most common benign breast lesion, peaking in ages 21–50 (mean 33.3 years), which is consistent with hormonally influenced changes. Ductal Ectasia is the 3rd most common benign breast lesion, accounting for 4.86% (21/432), Phyllodes Tumour (0.7%, n=3) and nipple adenoma (0.23%, n=1). (Figure 2 and Table 1).

Younger Decades (10–30 years) were dominated by fibroadenoma (79.5%) and mixed soft tissue lesions. Middle-Aged Groups (31–50 years) showed fibrocystic disease and ductal ectasia (4.3%, n=19). The older Patients (more than 51 years): limited cases were seen within this age group, with inflammatory breast conditions in an 81–90-year-old outlier. (Table 1).

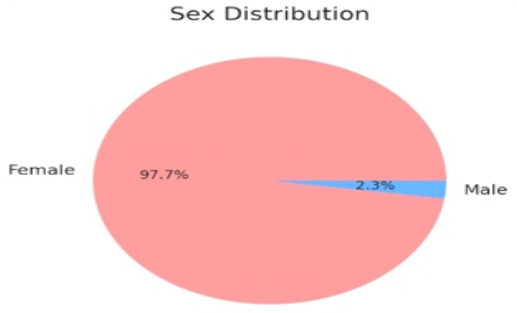

Figure 1: Sex Distribution of participants

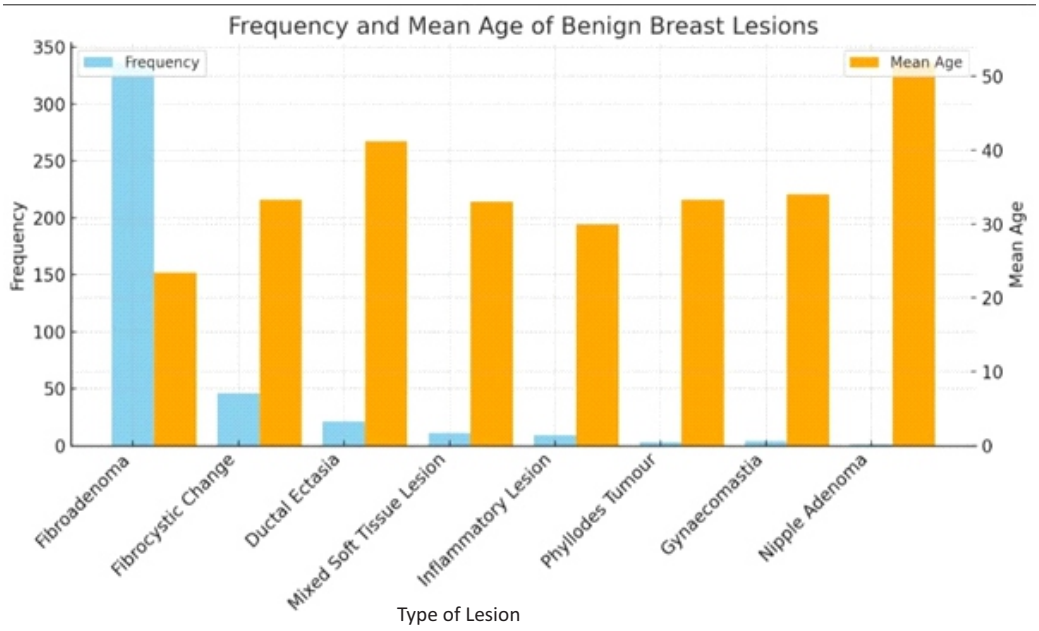

Figure 2: Types of lesions and the mean age among the participants

Table 1: Benign breast lesions by age groups among the study participants (N=432)

Lesions	10-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	Total
Fibroadenoma	147 (34.03)	121(28.01%)	56((12.96%)	10(2.31%)	3(0.69%)	0(0.0%)	0(0.0%)	0(0.0%)	337(78.01%)
Fibrocystic disease	4(0.93)	19(4.40%)	11(2.55%)	7(1.62%)	5(1.16%)	0(0.0%)	0(0.0%)	0(0.0%)	46 (10.65%)
Ductal ectasia	0 (0.00)	2(0.46%)	5(1.16%)	14(3.24%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	21 (4.86%)
Inflammatory lesions	1(0.23)	2(0.46%)	3(0.69%)	1(0.23%)	1(0.23%)	0(0.0%)	0(0.0%)	1(0.23%)	9 (2.08%)
Phyllode's Tumour	1(0.23)	2(0.46%)	0 (0.0%)	0 (0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	3 (0.69%)
Gynaecomastia	1(0.23)	3(0.69%)	0 (0.0%)	0 (0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	4 (0.93%)
Nipple adenoma	0(0.00)	0 (0.0%)	0 (0.0%)	0(0.0%)	0(0.0%)	1(0.23%)	0(0.0%)	0(0.0%)	1 (0.23%)
Mixed soft tissue lesions	5(1.16)	2(0.46%)	2(0.46%)	2(0.46%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	11 (2.55%)
Total	159(36.81%)	151(34.95%)	77(17.82%)	34(7.87%)	9(2.08%)	1(0.2%)	0(0.0%)	1(0.2%)	432(100%)

Table 2: Benign breast lesions by sex and mean age among the study participants (N=432)

Lesions	Male	Female	Mean age (years)	Total
Fibroadenoma	5(1.0%)	332(77.0%)	23.4	337 (78.0%)
Fibrocystic disease	1(0.2%)	45(10.0%)	33.3	46 (10.7%)
Ductal ectasia	0 (0.0%)	21(5.0%)	41.2	21 (4.9%)
Inflammatory breast lesions	1(0.2%)	8(1.9%)	38.5	9 (2.1 %)
Phyllodes tumour	0 (0.0%)	3(0.7%)	22.0	3 (0.7%)
Gynaecomastia	4(0.9%)	0 (0.0%)	23.9	4 (0.9%)
Nipple adenoma	1(0.2%)	0 (0.0%)	65.5	1 (0.2%)
Mixed soft tissue lesion	0 (0.0%)	11(2.5%)	35.4	11 (2.5%)
Total	12 (2.78%)	420(97.22)	35.4	432(100%)

DISCUSSION

This study outlines the histopathological spectrum of benign breast lesions (BBLs) in Makurdi, North-Central Nigeria, demonstrating epidemiological patterns that align with global trends while emphasising unique regional characteristics essential for effective clinical practice and public health planning. The significant female preponderance (97.22%) corresponds with biological vulnerability[1] and reflects findings from Nigeria[7,12] and sub-Saharan Africa (SSA) reports[3,5]. Male BBLs (2.78%) were primarily attributed to gynaecomastia (0.93%), aligning with research from Northern Nigeria (Kano: 2.4%; Sokoto: 1.2%). The reporting of male fibroadenoma (1.16%, n=5) and

fibrocystic alteration (0.23%, n=1)—although histopathologically uncommon—aligns with African case reports [8,16]. This may indicate diagnostic challenges in resource-constrained environments or hormonal factors specific to this demographic. Outstanding Dominance prevalence of fibroadenoma (78.01%, n=337) surpasses that observed in South-West Nigeria: Ile-Ife (63.4%[16]), Lagos (54.9%[17]), and Northern Nigeria: Kano (55.9%[8]), Sokoto (68.9%[9]). Global cohorts indicated a prevalence of 30–50% in Western populations with screening initiatives[14]. The highest prevalence occurs in young women aged 10 to 30 years (80.71%; mean age 23.4 years), which corresponds with worldwide hormonal pathophysiology[14] but indicates heightened regional risk factors such as early menarche, genetic susceptibility, or healthcare-seeking behaviours for palpable masses[15]. Age-Stratified Patterns Fibrocystic changes occurred in 10.65% of cases, peaking between the ages of 31 and 50 years, with a mean age of 33.3 years, aligning with hormonally active stages. Less than Jos, Nigeria (20.2%[16]) but greater than Rwanda (5.8%[17]). Ductal Ectasia (4.86% prevalence): Exclusively female, concentrated in perimenopausal women (ages 41–50; mean age 41.2 years), corresponding with its correlation to ductal involution[17]. Phyllodes Tumours (0.7%): Younger presentation (mean age 22.0 years) compared to Western averages (35–45 years[17]), although consistent with Nigerian data (Kano: 29 years[7]). Emphasises the necessity for expedited histological analysis in "rapidly proliferating fibroadenomas." The scarcity of occurrences contrasts with the elevated prevalence of sclerosing lesions and ductal ectasia in high-income countries, potentially indicating diminished longevity or healthcare availability in this population. Geographical disparities within Nigeria are evident when comparing the findings from the present study in Makurdi with those reported in Jos, North-Central Nigeria (Mandong et al.[10], 2019). In Makurdi, fibroadenoma accounted for 78.01% of breast lesions, significantly higher than the 49.9% reported in Jos. Conversely, fibrocystic changes were more common in Jos, at 20.2%, compared to 10.65% in Makurdi. Ductal ectasia prevalence was relatively similar between the two locations, with 4.86% in Makurdi and 5.5% in Jos. These differences in lesion distribution may be influenced by various factors, including demographic variations such as age, sex distribution, and genetic background, as well as referral patterns, which might skew case selection towards certain lesion types. Environmental exposures and lifestyle factors unique to each region could also contribute to these disparities.

Furthermore, it is important to consider that hospital-based study designs, like those employed in both Makurdi and Jos, may not fully capture the true prevalence of breast lesions within the broader community. Patients presenting to tertiary healthcare facilities often represent a subset of the population, which can introduce referral bias and limit the generalizability of findings.

Another notable limitation is the restricted availability and use of immunohistochemical techniques in these settings. For instance, detailed grading of phyllodes tumours or accurate classification of uncommon or diagnostically challenging lesions often relies on immunohistochemistry, which was limited or unavailable in the current context. This infrastructural constraint may impact diagnostic accuracy and the depth of pathological characterisation, potentially affecting clinical management and epidemiological data quality[18,19].

Addressing these disparities requires targeted strategies to improve regional diagnostic capacity and data collection. Enhancing access to advanced diagnostic tools such as immunohistochemistry and molecular techniques would enable more precise lesion classification and guide tailored patient management. Additionally, expanding community-based screening and epidemiological studies beyond hospital settings would provide more representative data on breast lesion prevalence and distribution. Collaborative multicentre research efforts across Nigeria could help to harmonise data collection, reduce referral bias, and elucidate regional variations more comprehensively. Strengthening healthcare infrastructure, coupled with increased training for histopathologists and clinicians, would further improve diagnostic accuracy and patient

outcomes. Ultimately, these measures are essential to developing evidence-based regional policies for breast health and improving cancer control strategies in Nigeria.

Limitations

Data completeness was limited by inconsistent record-keeping, and referral bias may have affected the representativeness of the findings for Makurdi or North-Central Nigeria. The study lacked clinical correlation as it relied solely on histopathological diagnoses with minimal demographic information. Although experienced histopathologists conducted the evaluations, variations in histological interpretation between observers remain possible.

CONCLUSION

This 10-year retrospective review confirms that benign breast lesions continue to constitute a significant burden of breast pathology in Makurdi, North-Central Nigeria. Fibroadenoma remains the most prevalent lesion, particularly among younger women, while fibrocystic changes are more common in older age groups. These age-related patterns are consistent with findings from other regions across Nigeria, Sub-Saharan Africa, and globally. The study's findings have important implications for clinical management, public health planning, medical training, and the strategic allocation of breast healthcare resources within the region. However, the retrospective nature of the study, relying solely on histopathological records, limits the availability of critical clinical information such as imaging findings, hormonal profiles, and follow-up outcomes, thereby constraining comprehensive patient assessment and management.

Recommendations

Strengthen regional breast health awareness to encourage early presentation, incorporate routine histopathology in the diagnostic evaluation of breast lumps, and promote multicentre studies to generate broader epidemiological data in Nigeria.

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