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Histopathological Study of Breast Cancer: Analysis of Clinical and Pathological Characteristics in a Patient Sample from Southern Iraq

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Abstract

Breast cancer is a heterogeneous disease with various morphological and molecular subtypes. The histological type, tumor grade, stage, pathological tumor size, and axillary lymph node involvement are key morphological factors in breast cancer classification. This study aimed to analyze the clinicopathological features of breast cancer patients. Paraffin-embedded tissue samples were collected from 132 previously diagnosed breast cancer patients at Al-Sadr Teaching Hospital in Basrah, Iraq, from May 2018 to April 2019. Clinical and pathological data were analyzed, focusing on tumor size, histological type, grade, stage, and lymph node involvement. Tumor histological parameters were assessed using the Bloom and Richardson grading method. The mean age of patients was 44.5 years, with 76.8% under 50 years old. Infiltrating ductal carcinoma (NOS) was found in 82.6% of cases, followed by infiltrating lobular carcinoma (8.3%). High-grade tumors (Grade III and II) were detected in 96.2% of cases, and 85.6% presented at advanced stages (Stage III and II). Tumor sizes T2 and T3 were observed in 87.9% of cases, and positive axillary lymph node involvement was present in 57.6% ($P < 0.05$). Breast cancer patients in this study presented at a younger age compared to Western populations, indicating that early-onset breast cancer (<50 years) is more aggressive based on the studied prognostic factors. In Iraq, a high frequency of breast cancer was observed in Basrah, likely due to strong family history, environmental factors, and advanced-stage diagnosis.

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Introduction

Breast cancer develops due to both environmental and genetic factors (Mittempergher, 2009). It is a malignant tumor originating from breast tissue, most commonly arising from the inner lining of milk ducts or the lobules that supply these ducts. Cancers originating from ducts are classified as ductal carcinomas, while those arising from lobules are termed lobular carcinomas (Hanahan and Weinberg, 2000). While breast cancers can originate in any breast tissue, approximately 70-80% derive from the epithelial lining of ducts or lobules (Harris *et al.,* 2004). The histological classification of breast cancer follows several schemata. According to the AJCC (2009), breast cancers can be categorized through four complementary approaches: Histological type, Tumor grade. Clinical stage (TNM system), and Molecular/gene expression profile.

The most common histological subtypes include:

Invasive ductal carcinoma (55-70%), Ductal carcinoma in situ (DCIS) (13-20%), Invasive lobular carcinoma (5-15%), (Arpino *et al.*, 2004; Eheman *et al.*, 2009).

DCIS represents a noninvasive condition where abnormal cells are confined to the ductal epithelium. With increased mammographic screening, DCIS detection rates have risen significantly (Vahteristo, 2003). When properly treated, DCIS (sometimes called "stage 0 cancer") has an excellent prognosis, with nearly all cases being curable (Pippen, 2005).

Tumor grading follows a standardized system: Well-differentiated (low grade), Moderately differentiated (intermediate grade), and Poorly differentiated (high grade). Higher grade tumors demonstrate more aggressive biological behavior and poorer prognosis (Staff, 2003). **Study Aims:** This investigation examines the clinicopathological features of breast cancer in Southern Iraqi patients, with particular focus on: Tumor size and histological grade, Clinical staging, Lymph node involvement status, Lactation history, and Familial relationships and patterns. The study aims to correlate these prognostic factors with disease presentation and outcomes in this specific population.

Materials and Methods

In this study, 132 breast carcinoma patients aged 25 to 81 years (mean age: 44.5 years) were selected from Al-Sadr Teaching Hospital in Basrah, Iraq, between May 2024 and April 2025. Patient data were collected through standardized questionnaires containing the following parameters: Age, Marital status, Parity, Family history of cancer, Lactation history, Tumor laterality, and other relevant clinical information. Histopathological analysis was performed using hematoxylin and eosin (H&E) staining of tissue sections. Tumor histological parameters were evaluated according to the Bloom-Richardson grading system (Bloom & Richardson, 1957).

Statistical Analysis:

All statistical analyses were performed using SPSS software (version 15). The following tests were employed:

1. **Chi-square test**:

- Applied for categorical data comparisons
- Statistical significance threshold set at $p < 0.05$

2. **Correlation regression analysis**:

- Pearson's correlation coefficient (R) calculated
- Significance level set at $R \geq 0.3$ (Paulson, 2008)

3. **Student's t-test**:

- Used for continuous variable comparisons
- Two-tailed significance threshold set at $p < 0.05$

Results and Discussions

Histopathological assessment of 132 breast cancer patients revealed the following distribution: Infiltrating ductal carcinoma (IDC): 109 cases (82.6%), Infiltrating lobular carcinoma (ILC): 11 cases (8.3%), Carcinoma in situ: 4 cases (3.0%), Mixed IDC and ILC: 5 cases (3.8%), Papillary carcinoma: 3 cases (2.3%). (Table 1; Figure 1).Tumor grading using the Nottingham Modification of Bloom-Richardson system showed: Grade I: 5 cases (3.8%), Grade II: 52 cases (39.4%), Grade III: 75 cases (56.8%), (Table 2; Figure 2). TNM staging distribution: Stage 0: 2 cases (1.5%), Stage I: 7 cases (5.3%), Stage II: 43 cases (32.6%). Stage III: 70 cases (53.0%), Stage IV: 10 cases (7.6%) (Table 3). Additional pathological findings: Tumor size: T2 tumors predominated (61.4%), Lymph node involvement: 76 cases (57.6%), Distant metastasis: 6 cases (4.5%) (Table 4).

This clinicopathological study of 132 breast cancer patients from southern Iraq revealed several key findings. The cohort demonstrated a young age distribution (mean age: 44.5 years), with 79.7% of patients presenting before age 50. Histopathological analysis showed infiltrating ductal carcinoma (IDC) as the predominant subtype (82.6%), followed by infiltrating lobular carcinoma (ILC) (8.3%), consistent with regional (Raje, 2011) and global patterns (Kollias *et al.*, 1997; Anderson *et al.*, 2006; Albrektsen *et al.*, 2010).

Notably, 28.4% of cases showed concomitant ductal carcinoma in situ (DCIS) or atypical hyperplasia in surrounding tissue, compared to 10.7% reported by Al-Janabi. Paget's disease was identified in 3.7% of cases, similar to the 3.4% reported by Schelfhout et al. (2000), potentially indicating early tumor detection.

Table.1 Histological type distribution (IDC: 82.6%; ILC: 8.3%).

Diagnosis	**Number**	***%***
Infiltrating ductal carcinoma (NOS)	109	*82.6*
Infiltrating lobular carcinoma	11	*8.3*
Carcinoma in situ	4	*3.0*
Mixed IDC and ILC	5	*3.8*
Papillary carcinoma	3	*2.3*
Total	*132*	*100*

Table.2 Grade distribution (Grade III: 56.8%).

Grade	**Number**	**%**
I	5	3.8
II	52	39.4
III	75	56.8
Total	132	100

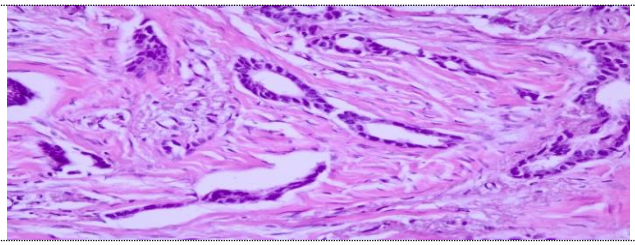
Table.3 Stage distribution (Stage III: 53%).

Stage	**Number**	**%**
0	**2**	1.5
I	**7**	5.3
II	**43**	32.6
III	**70**	53.0
IV	**10**	7.6
Total	132	100

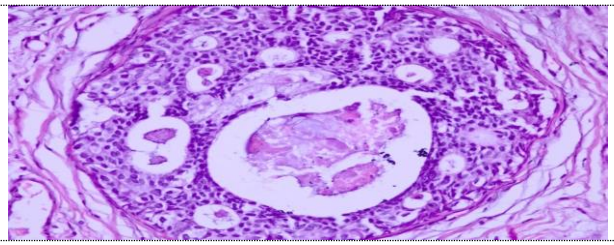
Table.4 Tumor size, lymph node involvement and distant metastasis in breast cancer cases

Criteria	Number	%
Tumor size		
Tis	4	**3.0**
T1	12	**9.1**
T2	81	**61.4**
T3	35	**26.5**
T4	0	**0.0**
Total	132	**100**
Auxiliary Lymph-Node Status		
Negative(N0)	56	**42.4**
Positive(Nx) †	76	**57.6**
Total	132	**100**
Distant Metastasis		
M0	126	**95.5**
M1	6	**4.5**
Total	**132**	**100**
† Nx: Positive auxiliary lymph-node Status (N1, 28.71%; N2, 21.86% and N3, 5.71%)		

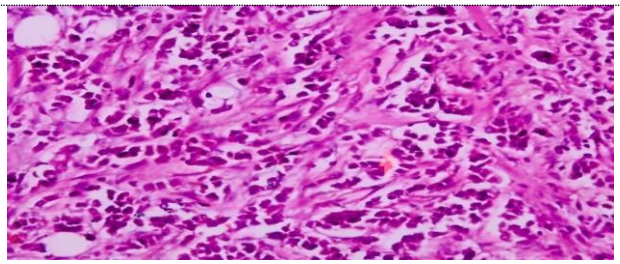
Figure.6 H&E-stained sections (IDC, ILC, mixed types).



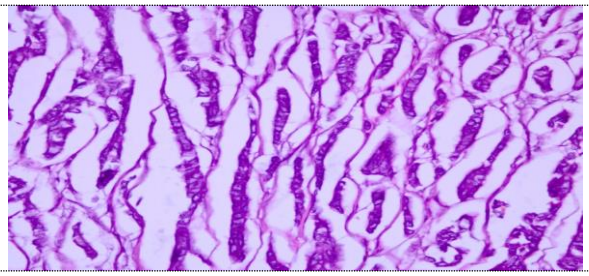
A. Infiltrating ductal well differentiated carcinoma. H&E.X40.



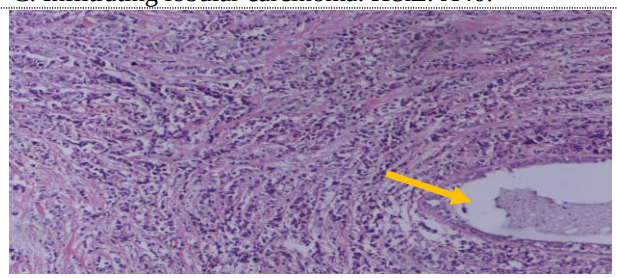
B. Insitu cribriform ductal well differentiated carcinoma. H&E.X40.



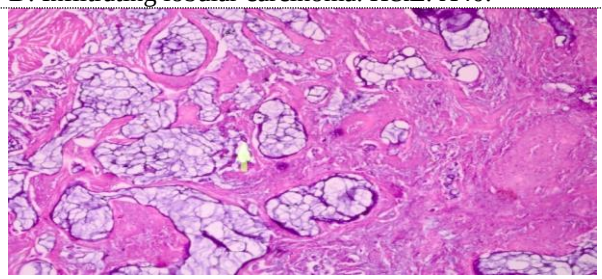
C. Infiltrating lobular carcinoma. H&E. X40.



D. Infiltrating lobular carcinoma. H&E. X40.

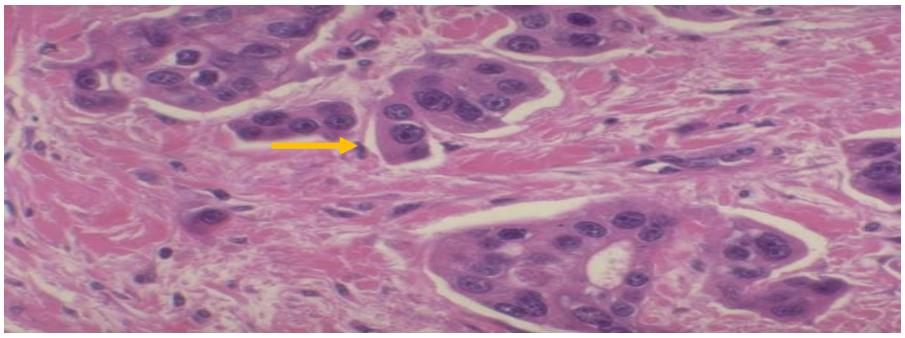


E. Mixed infiltrating ductal and lobular carcinoma. H&E. X100.

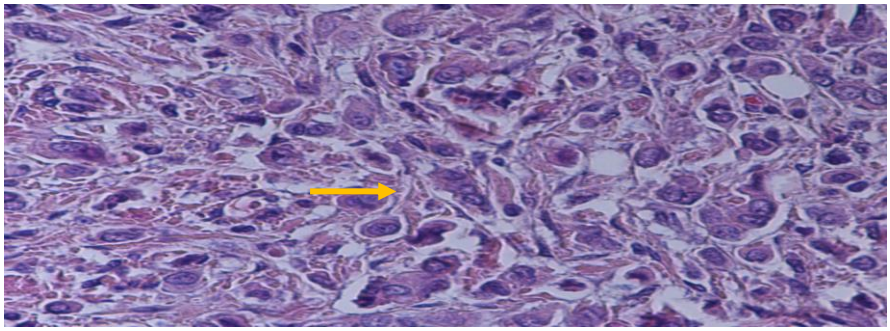


F. Mucinous carcinoma (Colloid): H&E. X10

Figure.7 Tumor grades (Grade I vs. III).



A. Infiltrating ductal carcinoma (NOS) grade I. X200 H&E.



B. Infiltrating ductal carcinoma (NOS) grade III H&E. X200.

The grading distribution revealed predominantly high-grade tumors: Grade I: 3.8%, Grade II: 39.4%, Grade III: 56.8%

Clinical staging demonstrated advanced disease at presentation: Stage 0: 1.5%, Stage I: 5.3%, Stage II: 32.6%, Stage III: 53.0%, Stage IV: 7.6%

Tumor characteristics showed: 61.4% presented with T2 tumors (2-5 cm), 57.6% had lymph node involvement, 4.5% showed distant metastasis.

These findings suggest significant diagnostic delays, likely due to limited screening programs and cultural barriers to early healthcare seeking (Majid *et al.*, 2009). The predominance of advanced-stage (85.6% Stage II-III), high-grade (96.2% Grade II-III) tumors with frequent lymph node involvement aligns with reports from Iraq (Al-Janabi, 2003; Al-Anbari, 2009) and the Arab world (Chouchane *et al.*, 2013; Lakkis *et al.*, 2010). Elkum et al. (2007) similarly noted higher Grade III tumors in younger patients (48.5% vs 36.4% in older patients).

The observed tumor characteristics differ markedly from Western populations. US data (Haffty *et al.*, 2000) report smaller median tumor sizes (1.6-1.9 cm) and earlier-stage presentation (79% Stage I). North African populations similarly show high-grade tumor predominance (65-86% Grade II-III) (Ben Ahmed *et al.*, 2002), with El-Bolkainy (2000) reporting mean tumor sizes of 4.5 cm and 75% lymph node involvement.

In conclusion, Southern Iraqi breast cancer patients exhibit distinct aggressive profiles, underscoring the need for: Enhanced screening programs. Public health education. Genetic risk assessment.

References

Al-Alwan N. Clinicocytopathological evaluation of nuclear DNA ploidy and hormone receptor contents of breast tumors [PhD thesis]. Baghdad: College of Medicine, Baghdad University; 1998.

Al-Anbari SS. Correlation of the clinicopathological presentations in Iraqi breast cancer patients with the finding of biofield breast cancer diagnostic system

(BDS), HER-2 & Ki-67 immunohistochemical expressions [PhD thesis]. Baghdad: College of Medicine, Baghdad University; 2009.

Albrektsen G, Heuch I, Thoresen S. Histological type and grade of breast cancer tumors by parity, age at birth, and time since birth: a register-based study in Norway. BMC Cancer. 2010; 10: 226.

Al-Janabi AA. Immunohistochemical study of p53-onco-suppressor gene in correlation to other biochemical markers in breast cancer (a prospective study) [PhD thesis]. Baghdad: College of Medicine, Baghdad University; 2003.

Al-Mulla F, Bland JM, Serratt D, Miller J, Chu C, Taylor GT. Age-dependent penetrance of different germline mutations in the BRCA1 gene. J Clin Pathol. 2011; 62: 350-6.

Anderson WF, Pfeiffer RM, Dores GM. Comparison of age distribution patterns for different histopathologic types of breast carcinoma. Cancer Epidemiol Biomarkers Prev. 2006; 15(10): 1899-905.

Antoniou A, Pharoah PD, Narod S, Risch HA, Eyfjord JE, Hopper JL, et al. Average risks of breast and ovarian cancer associated with BRCA1 or BRCA2 mutations detected in case series unselected for family history: a combined analysis of 22 studies. Am J Hum Genet. 2003; 72(5): 1117-30.

Armstrong K, Eisen A, Weber B. Primary care: Assessing the risk of breast cancer. N Engl J Med. 2000; 342(8): 564-71.

Arpino G, Bardou VJ, Clark GM, Elledge RM. Infiltrating lobular carcinoma of the breast: tumor characteristics and clinical outcome. Breast Cancer Res. 2004; 6(3): R149-56.

Arun B, Bayraktar S, Liu DD, Gutierrez-Barrera AM, Atchley D, Pusztai L, et al. Response to neoadjuvant systemic therapy for breast cancer in BRCA mutation carriers and noncarriers: a single institution experience. J Clin Oncol. 2011; 29(28): 3739-46.

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