

Histological Diagnostic Study of Breast Cancer in Maysan Governorate: A Comparative Analysis between Male and Female Patients

Histological
Diagnostic Study
of Breast Cancer
in Maysan
Governorate

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ABSTRACT

Objective: To characterize the histopathological spectrum of breast cancer and to provide the comparisons by sex where possible.

Study Design: Descriptive histopathology study

Place and Duration of Study: This study was conducted at the Oncology Department, Al-Sadr Teaching Hospital (Maysan) from 1st January 2026 to 31st March 2026.

Methods: 100 breast tumor tissue specimens (97 females and 3 males) obtained from the tissues were fixed in 10% formalin and processed using routine paraffin embedding and Hematoxylin–Eosin staining were selected. Slides evaluated by light microscopy (10^X, 40^X, 100^X). Recorded features included tumor architecture and cytology (e.g., nuclear pleomorphism, hyperchromasia, prominent nucleoli, multinucleation), stromal changes, tumor-infiltrating lymphocytes, and vascular/lymphovascular involvement.

Results: Invasive ductal carcinoma of no special type predominated. Common microscopic findings included cohesive malignant epithelial clusters with marked nuclear atypia and dense chromatin; frequent tumor-infiltrating lymphocytes; and evidence of intravascular/lymphovascular tumor cells in a subset of cases. Additional observations comprised stromal reactions and occasional multinucleation with prominent nucleoli. These features collectively indicate aggressive biological potential and risk of dissemination in part of the cohort.

Conclusion: Invasive ductal carcinoma of no special type predominated, with frequent lymphovascular invasion and marked nuclear atypia, underscoring the need for earlier detection, stronger pathology services, and a baseline for receptor/molecular subtyping studies.

Key Words: Cancer, Breast cancer, Carcinoma, Diagnostic, Histology

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INTRODUCTION

A group of diseases referred to as breast cancer is distinguished by uncontrolled cellular replication within breast tissue, typically presenting as a mass. Most lesions are believed to arise from the lobules or the lactiferous ducts. It is widely recognized as the most prevalent cancer in women and the primary contributor to cancer mortality among females.¹ The most common diagnostic type of cancer in the world was the breast cancer.

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According to GLOBOCAN 2020 estimates, 2.3 million new breast cancers were diagnosed worldwide in 2020. A 47% increase in cases of new cancers worldwide is expected between 2020 and 2040.² It has also revealed that one in 11 women will develop breast cancer.³ Among females in Western regions, breast cancer represents the leading form of cancer, with lifetime risk close to one in ten. In the US, the projected lifetime incidence of invasive breast cancer is about 12%, or roughly one woman in eight. High-income countries have achieved the greatest gains in prognosis, mainly through a combination of earlier detection programs and the routine use of adjuvant therapy conversely, middle-income and poor countries are being ravaged by breast cancer.⁴ In Iraq, the number of cases of this type of breast cancer increased after the year 2000 from (52.00/100,000) to the year 2019 (91.66/100,000). Optimal breast cancer management is contingent on accessible, high-quality prognostic and predictive factors from clinical and pathological assessment, which steer decision-making and therapy selection.⁵ Among people with early-stage breast cancer, treatment selection is individualized, and risk

stratification primarily considers nodal status, tumor diameter, and pathological (histologic) grade.

Among Iraqi women, mortality has been led by breast cancer, which constituted about one-third of all cancer cases documented nationally in 2024.⁶ Breast cancer encompasses diverse entities that differ in histology, biology, clinical presentation, behavior, and treatment response. Most microarray work has centered on invasive ductal carcinoma, no special type.⁷

This study purpose to describe the major histological changes observed in breast cancer tissues diagnosed at Al-Sadr Teaching Hospital, Maysan and to compare the frequency and pattern of key microscopic features such as lymphoid cell infiltration, intravascular tumor cells, nuclear atypia between female and male patients.

METHODS

This descriptive histopathology study was conducted at Oncology Department, Al-Sadr Teaching Hospital (Maysan) from 1st January 2026 to 31st March 2026 vide letter No. 314152/QM/Approval/JSDJNEHU dated December 20, 2025. One hundred breast tumor tissue specimens (97 females and 3 males) obtained from the tissues were fixed in 10% formalin and processed using routine paraffin embedding and Hematoxylin–Eosin staining were selected. A histological examination was conducted on it and after confirming the appearance of the pathological signs of the injury site, a tissue biopsy was taken from it, the tissue sections were prepared and a series of consecutive operations were performed.

The samples placed in 10% formalin solution for 24 hours, then the samples were washed with running water for several times to get rid of formalin. Then the samples were passed by an ascending series of ethyl alcohol concentration (70%, 80%, 90%, 100%) for a period of two hours for each concentration. For tissue thinning, samples were placed with solutions of a mixture of absolute alcohol with xylene in volume ratios (1:1-1:3) for one hour for each mixture and then put in pure xylene for half an hour. Then the samples were embedded in wax, then the samples were drunk by placing them in molten paraffin wax at a temperature of (58-60). It was placed inside special square-shaped molds and left the molds at room temperature and then cooled and kept in the refrigerator to freeze, then the sections obtained by using a manual microtome with a thickness of (3-5) microns. These sections were placed in a 50° water bath, then transferred onto clean glass slides coated with Meyer's albumin and placed on a Hot Plate for 5 minutes at the temperature of room for 24 hours. Then the samples were passed with descending concentrations of alcohols (100%, 90%, 80%, 70%), then the sections were stained by placing them in Haematoxylin eosin dye for 30 seconds, after which the slides were dried and placed in xylol. The glass slides were photographed by Micros Estuarine microscope under magnification (100x-40x-10x) respectively.

RESULTS

Most types of breast cancer observed in the study samples which have been examined were invasive (metastatic) ductal carcinoma with a percentage of 100%. Other types were found but with a small percentage. The presence of cancerous and lymphatic cells in breast tissue is evidence. The lymph nodes have been invaded by cancer cells near the breast tissue, and the observance of lymphoid cells on histological examination, is an indication of a danger to the patient's life (Fig. 1).

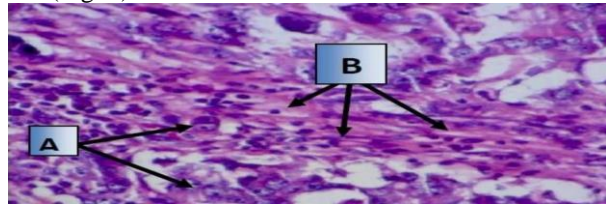


Figure No. 1: A cross section of human (female) breast tissue Cancer cells (A) Malignant cells, Lymphocytes (B) (40x) H&E

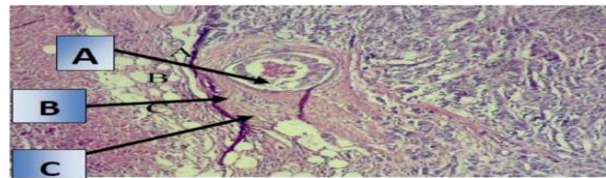


Figure No. 2: A cross section of human female breast tissue showing: (A): cancer cells, (B) RBC red blood cells (C) Malignant cell, blood vessel (10X) (H & E)

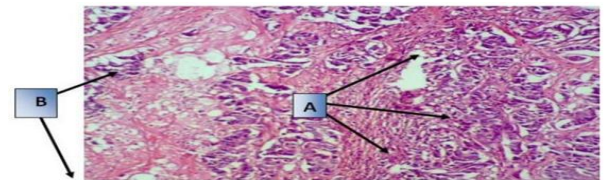


Figure No. 3: A cross-section of human (female) breast tissue with metastatic ductal carcinoma shows: Combined cancer cells (A) Fatty cells, (B) (H & E) (10 X)

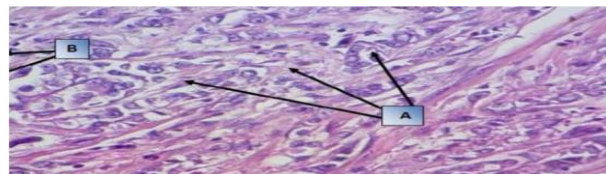


Figure No. 4: A cross section of human breast tissue (female) with metastatic ductal carcinoma (A) Nucleus (H&E) (40x) (B) Hyperplastic tumor cells

It can also be observed that the spread of cancer cells within the blood vessel is an evidence of the ability of the cancer cells to grow and spread, which Metastasis the other part of the body that is close to the breast tissue through the bloodstream, and this process is known as diffusion (Fig. 2).

It was also noted that the cancer cells were grouped together in separate places from each other, separated by cells of connective tissue and fat cells could be observed under the microscope in white(Fig. 3).

It was observed in the current study that the cancer cells in the affected breast tissue are very clearly scattered and excessive, and the nucleus is clear and can be seen easily and the nuclear to nucleus ratio is large and clear and the nuclear is prominent, and the chromatin is very dense (Figs. 4-5).

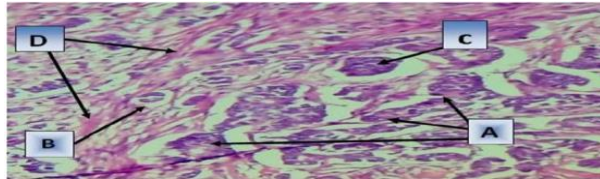


Figure No. 5: A cross section of human breast tissue (female) with invasive (metastatic) ductal carcinoma. (A) illustrates B Tumor cells, dense chromatin, C, nucleoli, stroma D, (H & E) (40 X)

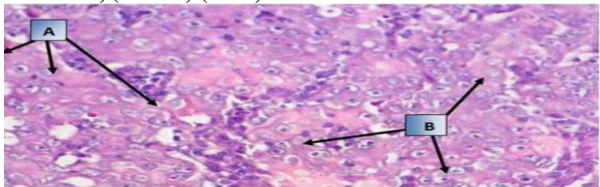


Figure No. 6: A cross section of the breast tissue of a human (female) with metastatic ductal carcinoma Multiple nuclei (B), cancer cells (A) (H & E) (10 X)

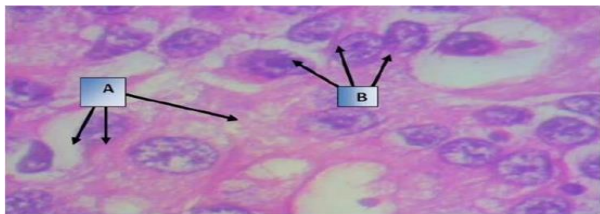


Figure No. 7: A cross section of human breast tissue (female) with metastatic ductal carcinoma Dense chromatin (A) (H&E) (100x), (B) shows poly nuclear intra nuclear

The present study results have shown that the carcinoma cells are scattered in the breast tissue and formed in the form of scattered assemblies that can be distinguished clearly. The nuclei are prominent, and as we note that some cells contain multiple nuclei and are scattered in the breast tissue affected by invasive ductal carcinoma (Fig. 6). It was also noted that the nuclei are multiple in the breast tissue affected by invasive ductal carcinoma and we note that the nucleus is large in size and very dense chromatin and contains multiple nuclei that can be seen clearly under the power of magnification(100x) (Fig. 7).

DISCUSSION

This study showed a similarity in the type of breast cancer that affects both women and men, as there was a

similarity in the pattern of the cancerous tissue, which was of the invasive ductal carcinoma type. Histological examination of patient samples revealed the absence of other types of breast cancer (invasive lobular carcinoma, ductal carcinoma in situ and lobular carcinoma in situ), which is consistent with what was stated by Al-Khayat et al⁸, 97% of breast cancer cases were ductal invasive and 3% were lobular invasive when histological examinations were conducted on patient samples in Najaf Governorate. This aligns with the findings of Mayada⁹, who, in her study, found that ductal breast cancer was the most prevalent type among women, 89.5%, while invasive lobular carcinoma represented 5.9% of the samples while the rest includes other types (invasive lobular carcinoma, ductal carcinoma in situ, and lobular carcinoma in situ). Diagnostics of breast cancer depend on the structure of the cancerous cell, which can be varied and have more types. However, due to the location of this cell in the breast ducts, this type of cancer is called ductal breast cancer to help diagnose and differentiate it. This type is considered the most common and because ducts in breast tissue are the most responsive place to the action of female sex hormones, the cell membrane in the ducts contains receptors for hormones, especially estrogen, which is responsible for their development. The tissue sections were examined after staining with hematoxylin-eosin to observe the histological changes in the sample and to diagnose the type of disease. Since it is one of the reliable methods It can also be chosen as the best method for diagnosing tissue tumors.¹⁰ This can be demonstrated by examining significant changes in the structure and composition of the tissue and its parts on the basis of histological examination of samples taken from breast tissue and observation of changes, the type of tumor can be classified, tumors are of various types, ranging from low-grade tumors showing the least possible multiple forms and high-grade tumors showing polymorphous tumors.¹¹ Invasive ductal carcinoma can be distinguished on the basis of distinct microscopic characteristics, including ductal carcinoma in situ or the nuclei appear in an irregular arrangement and vary in size and shape, and can be distinguished by the hyperpigmentation of hematoxylin-eosin and the protrusion of the nuclei. That is why this type of tumor was diagnosed by observing the characteristics of this type during histological examination of samples, and this agrees with the researcher.¹² It was also in the diagnosis of invasive ductal carcinoma in the current study that there are most changes in the structure and shape of the tissue, including that the malignant cells in the tissue can be clearly observed through the irregular shape of the cells, the nuclei are prominent and the nucleus is large in size, the chromatin is very dense. This is in agreement with Koss and Melamed¹³, reported that mammary gland cells that affected by ductal cancer are

Because of its large size, it can be easily distinguished. Peripheral cytoplasmic blebs and protrusion appear in the peripheral cytoplasm. They also noted during the examination of tissue samples that the nucleus was so large that it appeared swollen. As it was observed through the microscopic examination of the Slice samples in this study in the breast tissue affected by breast cancer, the cancer cells are spread in the tissue and spread into the blood vessels, is an indication of the possibility of spreading to other parts of the body. This is consistent with what was stated by Hunter et al¹⁴, showed that the process of spreading cancer cells. The diffusion process, which occurs through specific steps, is a complex process and includes the migration of cancer cells through the blood vessels in the blood stream and migrates to other parts of the body. Also, this result are identical with Mahdi et al¹⁵, pointed out that the histological changes were evident when examining the samples under a microscope, revealing that the chromatin was dense, and therefore the cells had it has the potential to infect other parts of the tissue with its different layers, whether epithelial or connective, that surround the cancerous tissue, it was also pointed out that the connective tissue cells are scattered on a base of polymorphous cells, which are abnormal in shape and size that cannot be distinguished easily. As it was shown during the histological examination of the samples in this study cancer cells appear close together, but in many places and separated, each group from the other. This is in agreement with Rabban et al¹⁶, which reported that breast cancer tissue, that in most cases when cancer develops, its cells clump together in a ball-like shape and have multiple nuclei. The cells may be close together or far apart, a characteristic not observed in normal tissues and, consequently, in normal cells. It was observed during the current study of breast tissue affected by invasive ductal breast cancer that the cancer cells are excessively dispersed and far from each other and the chromatin is dense, this is consistent with the results of Koss and Melamed¹³, who indicated during his study that breast tissue with invasive ductal carcinoma has dense chromatin and large cells appear in clusters and scattered and their characteristic is very large nuclei, this distinguishes it from diffuse lobular carcinoma, in which the cells appear very small and are single, and the cytoplasm is mucous. The pathological significance of these tissue changes is unknown, but it can be used during surgical operations, to distinguish normal tissue from the affected tissue, and thus helps the surgeon to get rid of the diseased tissue and get rid of the disease.¹⁶

CONCLUSION

This Maysan-based series is characterized chiefly by invasive ductal carcinoma of no special type with recurrent adverse histological features, including lymphovascular involvement and pronounced nuclear

atypia. The findings reinforce the need for early detection and robust pathology services in the region and provide a baseline for future studies integrating receptor status and molecular subtyping to refine prognostication and therapy selection.

Author's Contribution:

Concept & Design or acquisition of analysis or interpretation of data:	Yasser Al-Yasin
Drafting or Revising Critically:	Yasser Al-Yasin
Final Approval of version:	The above author
Agreement to accountable for all aspects of work:	The above author

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