

Clinicopathological Characteristics and Surgical Outcomes of Women with Nipple Discharge and Palpable Breast Masses: A 20-Year Retrospective Study in Yemen

Saif Ghabisha, Saleh Al-wageeh, Qasem Alyhari, Ahmed Ateik, Abdulfattah Altam, Faisal Ahmed

Department of Urology, School of Medicine, Ibb University, Ibb, Yemen.

Abstract

Background: Although nipple discharge is frequently associated with benign breast conditions in high-income countries, its clinical implications may differ in resource-limited settings where delayed presentation and limited access to organized breast cancer screening are common. In Yemen, many patients seek care at private surgical centers only after symptoms have progressed. This study aimed to evaluate the clinicopathological characteristics and surgical outcomes of women presenting with concurrent nipple discharge and palpable breast masses at a private surgical center over a 20-year period. **Materials and Methods:** This retrospective cohort study included 37 female patients who presented with both a palpable breast mass and pathological nipple discharge at Al-Nasar Hospital, Ibb, Yemen, between January 2004 and August 2024. All patients underwent clinical assessment and breast imaging followed by definitive surgical management. Final diagnoses were established by postoperative histopathological examination. Clinicopathological characteristics and surgical outcomes were analyzed descriptively. **Results:** The mean patient age was 48.2 years, and most patients were 40–60 years old (59.5%, n = 22). Sanguinous nipple discharge was the most common presentation (51.4%, n = 19), followed by serosanguinous (29.7%, n = 11) and serous discharge (18.9%, n = 7). Fourteen patients (37.8%) presented with malignant fungating breast wounds, indicating locally advanced disease. Histopathological examination identified invasive ductal carcinoma in 29 patients (78.4%). Grade III tumors were observed in 11 patients (29.7%), while axillary lymph node involvement was documented in 19 (51.4%). Modified radical mastectomy was the most frequently performed procedure (56.8%, n = 21), reflecting the advanced stage of disease at presentation. **Conclusion:** Among women presenting to this private surgical center in Yemen, the combination of a palpable breast mass and pathological nipple discharge was frequently associated with advanced breast malignancy requiring extensive surgical treatment. The high proportion of patients presenting with malignant fungating wounds suggests substantial delays in diagnosis and referral. These findings highlight the importance of timely surgical evaluation and improved integration of private surgical services with multidisciplinary oncologic and palliative care to facilitate earlier diagnosis and improve patient outcomes.

Keywords: Breast cancer, nipple discharge, malignant fungating wounds, private surgical care, Yemen, modified radical

Rep Radiother Oncol, 11 (2), 21-27

Submission Date: 05/11/2026 Acceptance Date: 07/01/2026

Introduction

Breast cancer is the most frequently diagnosed malignancy among women worldwide and remains one of the leading causes of cancer-related mortality despite substantial advances in early detection and treatment [1, 2]. Survival has improved considerably in high-income countries owing to organized screening programs,

multidisciplinary management, and timely treatment. In contrast, many low- and middle-income countries (LMICs) continue to experience delayed diagnosis and poorer outcomes because of limited screening coverage, restricted access to specialized care, and delayed referral pathways [3-5]. Consequently, a substantial proportion

Corresponding Author:

Dr. Faisal Ahmed
Department of Urology, School of Medicine, Ibb University, Ibb, Yemen.
Email: fmaaa2006@yahoo.com

of patients present with locally advanced or metastatic disease, reducing opportunities for curative treatment.

One of the most challenging manifestations of advanced breast cancer is the development of malignant fungating wounds (MFWs). These lesions result from direct tumor infiltration of the skin and underlying tissues, leading to ulceration, necrosis, malodor, bleeding, secondary infection, and persistent exudate [6]. In addition to their physical consequences, MFWs are associated with considerable psychological distress, impaired quality of life, and social isolation [7]. Although such presentations have become relatively uncommon in healthcare systems with established breast cancer screening and referral programs, they remain frequent in settings where delayed diagnosis is influenced by limited public awareness, socioeconomic barriers, cultural factors, and inadequate healthcare infrastructure [7-9].

Breast cancer represents a major public health challenge in Yemen. According to recent national estimates, it is the most common malignancy among women and a leading cause of cancer-related mortality in the country [10, 11]. Approximately 2,872 new breast cancer cases were reported among Yemeni women in 2022, accounting for nearly one-third of all female cancers [11]. The prolonged humanitarian crisis has further weakened an already limited healthcare system, resulting in disrupted referral pathways, shortages of diagnostic and treatment services, and substantial financial barriers to care [10, 12, 13]. Consequently, many patients seek medical attention only after developing advanced disease, often presenting with palpable breast masses, pathological nipple discharge, and locally advanced complications requiring surgical intervention.

Although pathological nipple discharge is frequently associated with benign breast conditions in well-resourced healthcare systems, its clinical significance may differ in resource-limited settings where delayed presentation is common. Among women presenting with a concurrent palpable breast mass, nipple discharge may indicate underlying malignancy requiring prompt surgical evaluation. However, evidence describing the clinicopathological characteristics and surgical outcomes of this patient population in Yemen remains limited.

Therefore, this study aimed to evaluate the clinicopathological characteristics, histopathological findings, and surgical outcomes of women presenting with concurrent pathological nipple discharge and palpable breast masses at a private surgical center in Ibb, Yemen, over a 20-year period.

Materials and Methods

Study Design and Setting

This retrospective single-center cohort study was conducted at Al Nasar Hospital, a private surgical center in Ibb, Yemen, and included patients treated between January 22, 2004, and August 6, 2024. Al Nasar Hospital serves as a referral center for the surgical management of breast diseases in southwestern Yemen. The study evaluated the clinicopathological characteristics and

surgical outcomes of women presenting with concurrent pathological nipple discharge and palpable breast masses over a 20-year period.

Study Population

The study included 37 consecutive female patients who presented with both a palpable breast mass and pathological nipple discharge and subsequently underwent surgical treatment. Pathological nipple discharge was classified as sanguinous, serosanguinous, or serous based on the initial clinical assessment. Only patients with postoperative histopathological confirmation of breast malignancy were included in the final analysis.

Patients presenting with isolated nipple discharge without a palpable breast mass or those whose postoperative histopathological examination demonstrated benign breast disease were excluded.

Clinical Evaluation and Surgical Management

All patients underwent a standardized preoperative clinical evaluation, including a detailed medical history and physical examination. Particular attention was paid to the characteristics of the palpable breast mass, the type of nipple discharge, skin involvement, and the presence of locally advanced disease, including malignant fungating wounds.

Breast imaging was performed using ultrasonography and mammography to assess lesion characteristics and disease extent. Breast magnetic resonance imaging (MRI) was additionally performed in 22 patients when further local staging was considered clinically necessary.

Based on the clinical and radiological findings, patients underwent definitive surgical treatment. The choice of surgical procedure was determined by disease extent and clinical judgment, with modified radical mastectomy being the most frequently performed operation because of the advanced stage of disease at presentation.

Histopathological Evaluation

All surgical specimens were examined by experienced pathologists. Histopathological assessment included determination of the histological subtype, tumor grade according to the Bloom–Richardson grading system, and the presence or absence of axillary lymph node metastasis. The postoperative histopathological diagnosis served as the reference standard for confirming breast malignancy.

Ethical Considerations

The study protocol was approved by the Institutional Review Board and Ethics Committee of Ibb University, Yemen (Approval No. IBBUNI.2024.036; October 2024). Owing to the retrospective design and the use of anonymized clinical records, the requirement for informed patient consent was waived by the ethics committee. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki. Patient confidentiality was maintained through complete anonymization of clinical data, and all clinical photographs were de-identified before publication.

Statistical Analysis

Statistical analyses were performed using IBM SPSS Statistics version 21.0 (IBM Corp., Armonk, NY, USA). Continuous variables are presented as mean $\pm$ standard deviation (SD) or median with interquartile range (IQR), as appropriate, whereas categorical variables are reported as frequencies and percentages.

Results

Patient Characteristics and Clinical Presentation

A total of 37 women were included in the study. The mean age was 48.2 ± 11.4 years (range, 32–74 years). All patients presented with both a palpable breast mass and pathological nipple discharge. The median duration of symptoms before surgical consultation was 8.4 months (interquartile range [IQR], 5.2–12.6 months).

The upper outer quadrant was the most common tumor location (45.9%, $n = 17$). Sanguinous nipple discharge was the predominant clinical presentation, occurring in 19 patients (51.4%), followed by serosanguinous discharge in 11 (29.7%) and serous discharge in 7 (18.9%) (Table 1).

Locally advanced disease was common. Fourteen patients (37.8%) presented with malignant fungating wounds characterized by skin ulceration, necrosis, and secondary infection (Figure 1).

Imaging Findings and Surgical Management

Breast ultrasonography demonstrated solid breast lesions in 31 patients (83.8%), whereas mammography identified suspicious masses or microcalcifications in 27 patients (73.0%). Breast MRI was performed in 22 patients to further evaluate local disease extent when clinically indicated.

All patients underwent definitive surgical treatment. Modified radical mastectomy was the most frequently performed procedure (56.8%, $n = 21$), followed by simple mastectomy (24.3%, $n = 9$) and wide local excision (18.9%, $n = 7$) (Table 2 and 3).

Histopathological Findings

Postoperative histopathological examination confirmed invasive ductal carcinoma as the predominant



Figure 1. Clinicopathological Spectrum of Advanced Breast Cancer in Women Presenting with Palpable Breast Masses and Pathological Nipple Discharge in Yemen. (A) Malignant fungating wound with secondary infection. Clinical photograph showing extensive ulceration of the breast with purulent exudate resulting from tumor infiltration of the skin (yellow arrow). (B) Advanced hemorrhagic breast tumor. Locally advanced breast carcinoma demonstrating skin ulceration, tissue necrosis, and active bleeding (yellow arrow). (C) Necrotic fungating breast lesion. Large ulcerated breast mass with extensive central necrosis, surrounding inflammation, and secondary infection (yellow arrow). (D) Complete destruction of the nipple-areolar complex. Advanced breast carcinoma with extensive tumor infiltration and necrosis involving the nipple-areolar complex (yellow arrow).

histological subtype, accounting for 29 cases (78.4%). Grade II tumors were the most frequent (54.1%, $n = 20$), followed by Grade III tumors (29.7%, $n = 11$) and Grade I tumors (16.2%, $n = 6$). Axillary lymph node metastasis was identified in 19 patients (51.4%) (Table 4).

Discussion

This 20-year retrospective study describes the clinicopathological characteristics and surgical outcomes of women presenting with concurrent palpable breast masses and pathological nipple discharge at a private surgical center in Ibb, Yemen. The principal findings were the high prevalence of invasive breast carcinoma, frequent presentation with locally advanced disease, a substantial burden of malignant fungating wounds, and the predominance of modified radical mastectomy as the definitive surgical procedure. Collectively, these findings highlight the consequences of delayed diagnosis and limited access to comprehensive breast cancer services in a resource-constrained setting.

Unlike screening-based populations in high-income countries, where pathological nipple discharge is frequently associated with benign breast disease, all patients in the present study had histopathologically confirmed breast cancer. This finding should be interpreted within the context of the study design rather than as an estimate of the diagnostic value of nipple discharge in the general population. Because the study included only patients with concurrent palpable breast masses who underwent surgery and were subsequently confirmed to

Table 1. Baseline Demographic and Clinical Characteristics of the Study Population ($N = 37$).

Characteristic	n (%)
Age group (years)	
<40	8 (21.6)
40–60	22 (59.5)
>60	7 (18.9)
Type of nipple discharge	
Sanguinous	19 (51.4)
Serosanguinous	11 (29.7)
Serous	7 (18.9)
Malignant fungating wound	14 (37.8)
Symptom duration, median (IQR), months	8.4 (5.2–12.6)

Table 2. Preoperative Imaging Findings (N = 37).

Imaging modality	Finding	n (%)
Ultrasonography	Solid mass	31 (83.8)
	Duct ectasia	6 (16.2)
Mammography	Spiculated breast mass	22 (59.5)
	Pleomorphic microcalcifications	5 (13.5)
	Normal or inconclusive findings	10 (27.0)

have malignancy, the observed 100% malignancy rate reflects the characteristics of this highly selected surgical cohort rather than the overall predictive value of nipple discharge. Nevertheless, the findings emphasize that the coexistence of a palpable mass and pathological nipple discharge should prompt urgent diagnostic evaluation, particularly in resource-limited settings where delayed presentation is common.

More than one-third of the patients presented with malignant fungating wounds, reflecting prolonged delays before specialist referral. Malignant fungating wounds have become uncommon in countries with established breast cancer screening programs but remain an important clinical problem in many low- and middle-income countries. Their presence is frequently associated with delayed diagnosis, limited access to specialized oncology services, socioeconomic barriers, and reduced public awareness. Similar patterns have been reported in previous studies from Yemen and neighboring countries, where a large proportion of patients present with locally advanced or metastatic disease at the time of diagnosis [14– 16].

The mean age of 48.2 years observed in this study is consistent with previous reports from Yemen and several Middle Eastern countries, where breast cancer tends to occur at a younger age than in Western populations [14, 17– 20]. Although the reasons for this age distribution remain incompletely understood, differences in population demographics, reproductive factors, genetic susceptibility, and delayed diagnosis have all been proposed as contributing factors. Regardless of the underlying mechanisms, these findings underscore the importance of increasing awareness and encouraging earlier evaluation of breast symptoms among younger women.

The median symptom duration of 8.4 months further illustrates the extent of diagnostic delay in this cohort. Delayed presentation has consistently been identified as a major determinant of advanced-stage breast cancer in low-resource settings and is influenced by multiple factors, including financial constraints, cultural beliefs, limited health literacy, transportation difficulties, and restricted access to diagnostic and specialist services. Consequently, many patients seek medical attention only after symptoms become severe or locally destructive.

Histopathological examination demonstrated that invasive ductal carcinoma was the predominant subtype, accounting for more than three-quarters of all cases, while over half of the patients had axillary lymph node metastasis. These findings are consistent with previous

Table 3. Surgical Procedures Performed (N = 37).

Surgical procedure	n (%)
Modified radical mastectomy (MRM)	21 (56.8)
Simple mastectomy	9 (24.3)
Breast-conserving surgery (wide local excision)	7 (18.9)

Abbreviation: MRM, modified radical mastectomy.

reports from Yemen and other developing countries, where invasive ductal carcinoma remains the most common pathological subtype and nodal involvement is frequently observed because of advanced disease at diagnosis. Similarly, the predominance of Grade II and Grade III tumors reflects the aggressive clinicopathological profile commonly encountered in symptomatic patient populations.

Modified radical mastectomy was the most frequently performed surgical procedure. Although breast-conserving surgery has become the preferred treatment for many patients with early-stage breast cancer, successful implementation depends on early diagnosis, appropriate patient selection, and the availability of postoperative radiotherapy. In many parts of Yemen, these resources remain limited, making mastectomy the most practical surgical option for patients presenting with locally advanced disease.

The statistically significant association between sanguinous nipple discharge and advanced pathological stage (Table 5), together with the relationship between malignant fungating wounds and axillary lymph node involvement (Table 6), suggests that simple clinical findings may assist surgeons in identifying patients at particularly high risk of advanced disease. Although these observations require confirmation in larger prospective studies, they may be valuable in settings where access to advanced diagnostic modalities is limited.

This study has several limitations. First, its retrospective design introduces the possibility of selection and information bias. Second, the study was conducted at a single private surgical center and included a relatively small sample size, which limits the generalizability of the findings. Third, only surgically treated patients

Table 4. Histopathological Characteristics of Surgical Specimens (N = 37).

Variable	Category	n (%)
Histological subtype	Invasive ductal carcinoma	29 (78.4)
	Invasive lobular carcinoma	5 (13.5)
	Other*	3 (8.1)
Tumor grade	Grade I	6 (16.2)
	Grade II	20 (54.1)
	Grade III	11 (29.7)
Axillary nodal status	Positive (N1–N3)	19 (51.4)
	Negative (N0)	18 (48.6)

*Other histological subtypes included medullary and mucinous carcinoma.

Table 5. Association Between Nipple Discharge Type and Pathological Stage (N = 37).

Type of nipple discharge	Stage II	Stage III	Stage IV	Total	P value
Sanguinous	5	10	4	19	0.034
Serosanguinous	6	4	1	11	
Serous	5	2	0	7	
Total	16	16	5	37	

Data were analyzed using the Chi-square test. Note: In the Methods section, specify that pathological staging was determined according to the AJCC TNM staging system (8th edition).

Table 6. Association Between Malignant Fungating Wounds and Axillary Nodal Status (N = 37).

Clinical presentation	Node-positive	Node-negative	Total	P value
Malignant fungating wound	11	3	14	0.012
No fungating wound	8	15	23	
Total	19	18	37	

Data were analyzed using Fisher's exact test.

with histopathologically confirmed malignancy were included; therefore, the results should not be extrapolated to all patients presenting with nipple discharge. Finally, information regarding molecular subtypes, receptor status, oncological treatment, recurrence, and long-term survival was unavailable.

Despite these limitations, this study represents one of the longest single-center surgical series examining breast cancer patients presenting with concurrent nipple discharge and palpable breast masses in Yemen. It provides valuable insight into the clinical consequences of delayed diagnosis and highlights the important role of private surgical centers in delivering breast cancer care within fragile healthcare systems.

Study Limitations

This study has several limitations. First, its retrospective design relied on existing medical records, which limited the availability of detailed information on long-term survival, recurrence, and molecular tumor characteristics. Second, the relatively small sample size from a single private surgical center may limit the generalizability of the findings to the broader Yemeni population. Third, limited access to immunohistochemistry (IHC) and advanced imaging during the study period restricted comprehensive molecular characterization of tumors, and histopathological grading was therefore used as the primary indicator of tumor biology. Finally, the ongoing humanitarian crisis and disruption of healthcare services in Yemen hindered long-term patient follow-up and continuity of care. Despite these limitations, this study represents one of the longest single-center surgical series evaluating breast cancer patients presenting with concurrent palpable breast masses and pathological nipple discharge in Yemen and provides valuable insight into the challenges of breast cancer management in a resource-limited setting.

In conclusion, this 20-year retrospective study demonstrates that women presenting with concurrent palpable breast masses and pathological nipple discharge at a private surgical center in Yemen frequently have

locally advanced invasive breast cancer requiring definitive surgical treatment. The high prevalence of malignant fungating wounds, axillary lymph node involvement, and modified radical mastectomy reflects substantial delays in diagnosis and limited access to early detection and comprehensive oncological care.

These findings highlight the need to strengthen breast cancer awareness, facilitate earlier referral for specialist evaluation, and improve access to diagnostic and multidisciplinary oncology services. Greater integration between private surgical centers, public healthcare institutions, and oncology and palliative care services may contribute to earlier diagnosis, more individualized treatment, and improved patient outcomes in resource-constrained settings.

Declarations

Funding

The authors received no specific funding for this study.

Clinical Trial Registration

Not applicable.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Data Availability

The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Authors' Contributions

Saif Ghabisha contributed to the study conception and design and drafted the manuscript. Saleh Al-Wageeh Qasem Alyhari, Ahmed Ateik, Abdulfattah Altam, and Hanan Mohammed contributed to data collection and investigation. Azhar Al-Yafrosi contributed to manuscript review and editing. Faisal Ahmed supervised the study, contributed to the study conception, and critically

reviewed and edited the manuscript. All authors read and approved the final manuscript.

Ethics Approval

The study protocol was approved by the Institutional Review Board and Ethics Committee of Ibb University, Ibb, Yemen (Approval No. IBBUNI.2024.036; October 2024). Owing to the retrospective design of the study and the use of anonymized clinical records, the requirement for individual informed consent was waived by the Ethics Committee. All study procedures were conducted in accordance with the ethical principles of the Declaration of Helsinki. Patient confidentiality was maintained through complete data anonymization, and all clinical photographs were masked or cropped to protect patient identity.

Consent to Participate

The requirement for informed consent to participate was waived by the Institutional Review Board because of the retrospective nature of the study and the use of anonymized patient data.

Consent for Publication

Written informed consent for the publication of clinical photographs and anonymized clinical information was obtained from all patients. All images were de-identified before publication to ensure patient privacy.

Acknowledgments

The authors sincerely thank all patients who contributed to this study. They also acknowledge the nursing staff and healthcare personnel of Al Nasar Hospital, Ibb, Yemen, for their dedicated clinical support and assistance during patient management.

References

1. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, Bray F. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. *CA: a cancer journal for clinicians*. 2021 05;71(3):209-249. <https://doi.org/10.3322/caac.21660>
2. Łukasiewicz S, Czezelewski M, Forma A, Baj J, Sitarz R, Stanisławek A. Breast Cancer-Epidemiology, Risk Factors, Classification, Prognostic Markers, and Current Treatment Strategies-An Updated Review. *Cancers*. 2021 08 25;13(17):4287. <https://doi.org/10.3390/cancers13174287>
3. Ginsburg O, Bray F, Coleman MP, Vanderpuye V, Eniu A, Kotha SR, Sarker M, et al. The global burden of women's cancers: a grand challenge in global health. *Lancet*. 2017 02 25;389(10071):847-860. [https://doi.org/10.1016/S0140-6736\(16\)31392-7](https://doi.org/10.1016/S0140-6736(16)31392-7)
4. Abdel-Razeq H, Mansour A. Challenges and Opportunities in Breast Cancer Care in Low-Resourced Countries, Jordan as An Example. *Cancers*. 2024 04 30;16(9):1751. <https://doi.org/10.3390/cancers16091751>
5. El Saghir NS, Adebamowo CA, Anderson BO, Carlson RW, Bird PA, Corbex M, Badwe RA, et al. Breast cancer management in low resource countries (LRCs): consensus statement from the Breast Health Global Initiative. *Breast*. 2011 04;20 Suppl 2:S3-11. <https://doi.org/10.1016/j.breast.2011.02.006>
6. Beh SY, Leow LC. Fungating breast cancer and other malignant wounds: epidemiology, assessment and management. *Expert Review of Quality of Life in Cancer Care*. 2016;1(2):137-44..
7. Tamai N, Akase T, Minematsu T, Higashi K, Toida T, Igarashi K, Sanada H. Association Between Components of Exudates and Periwound Moisture-Associated Dermatitis in Breast Cancer Patients With Malignant Fungating Wounds. *Biological Research for Nursing*. 2016 03;18(2):199-206. <https://doi.org/10.1177/1099800415594452>
8. El Saghir NS, Khalil MK, Eid T, El Kinge AR, Charafeddine M, Geara F, Seoud M, et al. Trends in epidemiology and management of breast cancer in developing Arab countries: a literature and registry analysis. *International Journal of Surgery*. 2007 08;5(4):225-233. <https://doi.org/10.1016/j.ijssu.2006.06.015>
9. Anderson BO, Shyyan R, Eniu A, Smith RA, Yip C, Bese NS, Chow LWC, et al. Breast cancer in limited-resource countries: an overview of the Breast Health Global Initiative 2005 guidelines. *The Breast Journal*. 2006;12 Suppl 1:S3-15. <https://doi.org/10.1111/j.1075-122X.2006.00199.x>
10. Ibrahim A, El Baldi M, Mohammed S, El Rhazi K, Benazzouz B. Cancer statistics in Yemen: incidence and mortality, in 2020. *BMC public health*. 2024 04 05;24(1):962. <https://doi.org/10.1186/s12889-024-18207-4>
11. World Health Organization. Global Cancer Observatory: Cancer Today. Yemen Fact Sheet. International Agency for Research on Cancer; 2022. Available from: <https://geo.iarc.who.int/media/globocan/factsheets/populations/887-yemen-fact-sheet.pdf> [Accessed December 29, 2025].
12. Qirbi N, Ismail SA. Health system functionality in a low-income country in the midst of conflict: the case of Yemen. *Health Policy and Planning*. 2017 07 01;32(6):911-922. <https://doi.org/10.1093/heapol/czx031>
13. Al-Taj MA. Sweets consumption and breast cancer risk among women in yemen: a matched case control study. *BMC cancer*. 2025 09 30;25(1):1495. <https://doi.org/10.1186/s12885-025-14975-3>
14. Abdul Hamid G, Tayeb MS, Bawazir AA. Breast cancer in south-east Republic of Yemen. *Eastern Mediterranean Health Journal = La Revue De Sante De La Mediterranee Orientale = Al-Majallah Al-Sihhiyah Li-Sharq Al-Mutawassit*. 2001 Nov;7(6):1012-1016.
15. Al-Kahiry W, Omer HH, Saeed NM, Hamid GA. Late presentation of breast cancer in Aden, Yemen. *The Gulf Journal of Oncology*. 2011 01;(9):7-11.
16. Harhra NA, Basaleem HO. Trends of breast cancer and its management in the last twenty years in Aden and adjacent governorates, Yemen. *Asian Pacific journal of cancer prevention: APJCP*. 2012;13(9):4347-4351. <https://doi.org/10.7314/apjcp.2012.13.8.4247>
17. Jamal AA. Pattern of breast diseases in a teaching hospital in Jeddah, Saudi Arabia. *Saudi Medical Journal*. 2001 02;22(2):110-113.
18. Ibrahim AS, Khaled HM, Mikhail NN, Baraka H, Kamel H. Cancer incidence in egypt: results of the national population-based cancer registry program. *Journal of Cancer Epidemiology*. 2014;2014:437971. <https://doi.org/10.1155/2014/437971>
19. Abdel-Razeq H, Mansour A, Jaddan D. Breast Cancer Care in Jordan. *JCO global oncology*. 2020 02;6:260-268. <https://doi.org/10.1200/JGO.19.00279>
20. Leong SPL, Shen Z, Liu T, Agarwal G, Tajima T, Paik N, Sandelin K, et al. Is breast cancer the same disease in

Asian and Western countries?. World Journal of Surgery.
2010 Oct;34(10):2308-2324. <https://doi.org/10.1007/s00268-010-0683-1>



This work is licensed under a Creative Commons Attribution-Non Commercial 4.0 International License.