CASE REPORT

BREAST CANCER IN YOUNG ADULTS: A CASE SERIES

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ABSTRACT

Introduction: Breast cancer is the most common cancer among women globally. The age at presentation is crucial and determines the type, prognosis, or outcome of treatment. We report two cases of breast cancer in young adult patients due to its rarity and the need for clinicians to have a high index of suspicion while assessing any breast tumor in such patients.

Case presentation: The clinical presentations of a breast lump in the 20 and 24-year-old single ladies both of Yoruba origin, in the western region of Nigeria were similar. They both presented with right and left breast mass with ipsilateral axillary lymphadenopathy respectively. The vital signs were normal and there was no swelling anywhere else in the body. Further physical examination was unremarkable. The pre-operative investigations included a chest X-ray, Abdominal-pelvic ultrasound scan, Full blood count, and Electrocardiogram, which were all within normal limits in both patients. The clinical diagnosis of stage 3 breast cancer was made. Subsequently, histopathological diagnosis of the tissue biopsy revealed Invasive ductal carcinoma Grade 3, and Immunohistochemistry studies were also done. They were both planned for Chemotherapy (six cycles) and were given 4 cycles of Chemotherapy (5-Fluoro-uracil, Adriamycin & Cyclophosphamide- FAC Regimen). One had left modified radical mastectomy done with Radiotherapy, the second patient declined surgery and defaulted thereafter.

Conclusion: It is of great concern that the age at presentation for breast cancer is younger as compared to the regular middle-aged presentation as stated by several literatures.

Keywords: Case report, Breast cancer, Histopathology, Chemotherapy, Young adult cancer

INTRODUCTION

Breast cancer remains the most common cause of cancer death amongst women,[1] besides, the most frequently occurring cancer seen amongst women globally.[1] Breast cancer is rare before age 30, but the reasons for such cases in younger age are not well understood. It comprised at least 21.8% of the overall cancer among young adult women.[2] The peak age for breast cancer is in the mid-forties.[3] Breast cancer in women under 40 years is uncommon and constitutes about 10% of new breast cancer diagnoses identified amongst women in general.[4] Epidemiology and SEER program shows that 75% of breast tumors occur in women aged greater than 50 years, only 6.5% in women aged less than 40 years, and 0.6% in women less than 30 years of age.[5] Greater than 14,000 women aged 40 years and younger are diagnosed with Breast cancer annually in the USA and several thousand more are diagnosed all over the world.[6] The survival rate for younger women with breast cancer remains lower compared with older women.[7] The lifetime risk of breast cancer is still high, comprising 8% to 12%.[8]

Breast cancer in young women is considered a public health problem because, at this younger age, the diagnosis impacts familial relationships and other domains.[9] The additional implications include; career, employment, and family issues.[9] Thus, the potential financial, psychological, and social impacts of breast cancer diagnosis at a young age can be even more burdensome.[9] Other relevant issues include genetic counseling, fertility preservation, management of long-term side effects, social and couple relationships, and employment.[10]

Consequently, the outcome, curability, and prognosis of breast cancer in younger women are worse and have a higher incidence of reoccurrence than older patients.[11] Young age at breast cancer diagnosis has been historically considered a poor prognostic factor. The disparity in the tumor biology, inappropriate treatment, and resistance to systemic therapy may be the cause of the poor prognosis.[7] In the United States of America, black women have higher breast cancer-specific mortality rates than white women.[12] There are factors attributable to this high mortality which include younger age at presentation and a greater proportion of more aggressive breast cancer subtypes.[12,13] The risk of breast cancer is higher in young women who have mutations in genes such as TP53, PTEN, STK11, PALB2, etc.[4]

Globally, the incidence of breast cancer is increasing and even more so in societies that previously had low incidence of the disease.[14] The reasons for the high incidence of breast cancer now in Nigeria could be due to improved screening and diagnosis.[14] The trend towards westernization may also be a reason for a change in demographic profile and lifestyle.[12] The disease burden is increasing rapidly and becoming an urgent problem in low-resource countries like Nigeria with a growing incidence of up to 5% per year.[15]

The symptoms of breast cancer in young women are similar to that of older women.[4]

The care of young women with breast cancer is complex thus multidisciplinary approach is mandatory.[10] The survival of young women with breast cancer is worse than that of older women. The mortality rate is more than three times higher.[5,16] Young women with breast cancer are often in the eye of the storm regarding tumor staging and behavior.[14] The growth rate of breast cancer is faster (short doubling time) than in older women.[14,17] There are usually medical misses by health care providers due to lack of suspicion of malignancy in this age group. This results in diagnostic delays in young women.[7,17]

It is noted that young women are underrepresented in large prospective cohort studies which may help in evaluating treatment strategies and prognosis. Furthermore, not having adequate data may result in young women being delayed in benefitting from treatment or being at risk of overtreatment.[16,17]

From the aforementioned, breast cancer is seen more frequently among younger Nigerian women, and this clinical scenario can no longer be ignored. We report two cases of breast cancer in young adult patients due to its rarity and the need for clinicians to have a high index of suspicion while assessing any breast tumor in such young-aged group patients.

CASE PRESENTATION

Case 1

A 20-year-old female undergraduate of Yoruba origin, Southwest Nigeria. She presented at the Oncology outpatient clinic with a 6-month history of a right breast mass which increased gradually in size over the duration. There was neither a family history of breast cancer nor the use of oral contraceptive pills. Physical examination was unremarkable. The left breast was essentially normal. Examination of the right breast revealed a tiny ulcer on the anterior surface of the breast mass over the nipple-areolar complex. The mass was roundish, measured 6cm by 6cm in its greatest dimension. It was firm, non-tender, and fixed to the chest wall, with an ipsilateral mobile axillary lymph node. The systemic examinations were otherwise unremarkable. The body weight was 70kg, height of 1.72m, and the body surface area (BSA) of 1.8. We made a clinical diagnosis of right breast carcinoma (T4 N2 MX) using the American Joint Committee on Cancer (AJCC) 7th edition (2010). The chest radiograph, full blood count, electrolytes, urea and creatinine, abdominopelvic ultrasound scan and an echocardiogram were all within normal limits. She had an incisional biopsy, and the histopathology revealed Invasive ductal carcinoma, Nottingham grade 3. An immunohistochemistry study revealed ER – negative, PR – negative, and HER2 neu-negative (Triple Negative Breast Cancer). She was counseled on possible side effects of chemotherapy and other fertility issues. She was then planned for neo-adjuvant chemotherapy, FAC Regimen (5-Fluorouracil 500mg/m^2, Doxorubicin 50mg/m^2 and Cyclophosphamide 500mg/m^2). While on each cycle of chemotherapy, her vital signs were checked. She was well hydrated and was given anti-emetics pre- and post-chemotherapy.

She was given four cycles of chemotherapy; thereafter, was planned for a right modified radical mastectomy. She declined the mastectomy despite several counseling sessions, and also due to parental refusal. Thus, she was unable to complete the remaining two cycles of chemotherapy and radiotherapy to the right chest wall and axilla. Ultimately, she

defaulted further treatment and failed to show up for follow-up.

Case 2

A 24-year-old female graduate of Yoruba origin, Southwest Nigeria. She presented at the Oncology outpatient clinic with an 8-month history of a left breast mass. The mass had increased gradually in size over the duration. There was a family history of breast cancer in the maternal grandmother and no history of use of oral contraceptive pills. Physical examination was unremarkable. The right breast was essentially normal. Examination revealed left breast asymmetry; there was nipple retraction with peau d'orange. The breast mass was oval, measured 20cm by 20cm in its greatest dimensions. The mass was firm, nodular, and fixed to the chest wall. There were associated ipsilateral matted axillary lymph nodes. We made a clinical diagnosis of left breast carcinoma -T4 N2 MX using the AJCC 7th edition (2010). She had the following investigations including a chest radiograph, full blood count, electrolytes, urea and creatinine, abdominopelvic ultrasound scan and an echocardiogram done; the results were all within normal limits. An incisional biopsy was done and the histopathology revealed Invasive ductal carcinoma, Nottingham grade 3. Immunohistochemistry was further done, and it revealed ER – negative, PR – negative and HER2 neu- positive, (HER2 enriched subtype).

Subsequently, she was counseled on possible side effects of chemotherapy and other fertility issues. She was then planned for neo-adjuvant chemotherapy, FAC Regimen (5-Fluorouracil 500mg/m^2, Doxorubicin 50mg/m^2 and Cyclophosphamide 500mg/m^2). While on each cycle of chemotherapy, her vital signs were checked. She was well hydrated and was given anti-emetics pre- and post-chemotherapy. She was given four cycles of chemotherapy; thereafter was planned for left radical mastectomy. She was co-managed with the general surgery team for the surgical procedure. The post-operative status was good. She further had two more cycles of chemotherapy (adjuvant therapy). Thereafter, she was referred to Lagos University Teaching Hospital (LUTH), Lagos for radiotherapy (adjuvant therapy) to the left chest wall and axilla. She had 45Gray in 20 fractions and post-radiotherapy status was satisfactory. She is presently being planned for sub-cutaneous Trastuzumab 600mg monthly covering 18 months, and to be on regular follow-up.

Table 1: Summary of Cases

	CASE 1	CASE 2
Age	20	24
Sex	Female	Female
Marital status	Single	Single
Site	Right	Left
Stage	3	3
Parity **Age at menarche**	0 10	0 13
Occupation	Undergraduate	Graduate
Religion	Christianity	Christianity
Family history **Histology** **Grade**	Nil Invasive ductal carcinoma 3	Yes Invasive ductal carcinoma 3
Chemotherapy Regimen	FAC	FAC
Number of cycles	4	6
Immunohistiochemistry	ER(Negative), PR(Negative), HER-2 neu (Negative)	ER(Negative), PR(Negative), HER-2 neu (Positive)
Surgery	Not done	Done
Radiotherapy	Not done	Done
Hormonal therapy **Targeted therapy** **Outcome**	Nil Ni Lost to follow-up	Nil Nil On follow-up

Figure 1: Case 1- Breast mass before chemotherapy

Figure 2: Case 1- Breast mass after 4 cycles of chemotherapy

Figure 3: Case 2- Breast mass before chemotherapy

Figure 4: Case 2- Post-Mastectomy after Neo-adjuvant chemotherapy

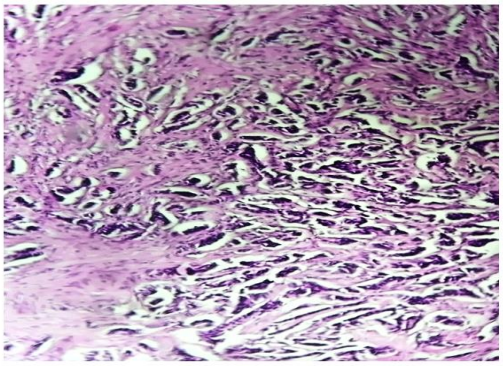

Figure 5: Case 1- H & E-stained sections of the breast tissue showing infiltrating nests, sheets, cords and trabeculae of malignant epithelial cells. (x4)

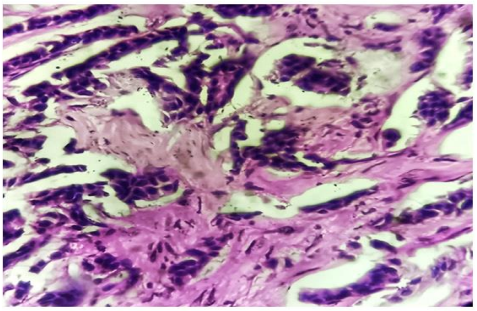

Figure 6: Case 1-H & E-stained sections of the breast tissue showing infiltrating nests, sheets, cords and trabeculae of malignant epithelial cells. (x40)

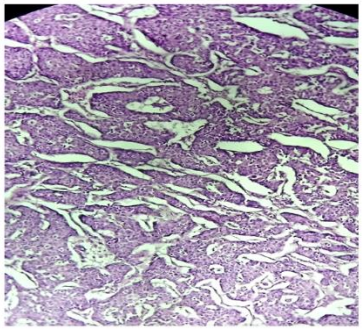

Figure 7: Case 2- H & E-stained sections of the breast tissue showing infiltrating nests, sheets, cords and trabeculae of malignant epithelial cells. (x4)

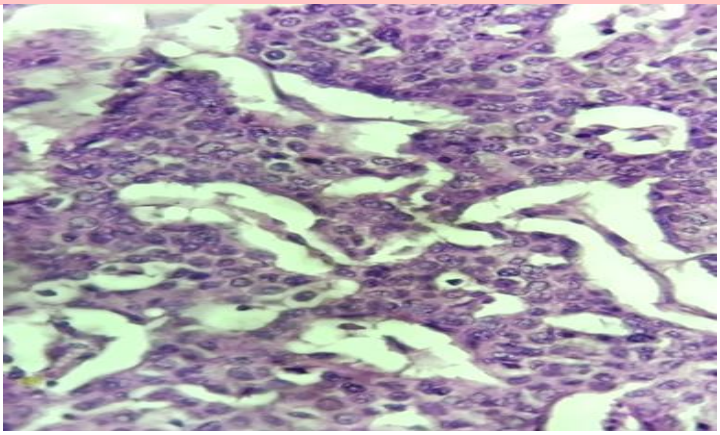

Figure 8: Case 2- H & E-stained sections of the breast tissue showing infiltrating nests, sheets, cords and trabeculae of malignant epithelial cells. (x40)

DISCUSSION

The behavioral pattern of breast cancer in women under 40 years of age differs from breast cancer in older women, especially in clinical, pathological, and biological characteristics.[18,19] There are risk factors associated with breast cancer such as early menarche, late menopause, family history, nulliparity, and use of oral contraceptive pills.[4,18,19] Interestingly, some of these risk factors were evident among the patients recruited for this case report. The age at menarche was quite early for the two patients. It's fascinating to observe that the patient in the first case presentation attained menarche at the age of 10 years.[18,19] This case report equally confirmed that breast cancer arising under 30 years has a more aggressive pattern which was substantiated by the immunohistochemistry study presented especially for the triple-negative type that has been established globally to be of poor prognostic index and aggressive pattern.[20-22] Moreover, it is surprising to note that both of the patients presented were nulliparous. Besides, nulliparity as a risk factor in breast cancer may also be reflected in this case report.[18,19]

The pathological appearance of the two cases presented was similar; invasive ductal carcinoma which is the most common type of breast cancer in young women.[4] They were both high-grade and also locally advanced diseases. One of the patients had a positive family history of breast cancer i.e., in maternal grandmother. This connotes a possible genetic susceptibility through BRCA1 and BRCA2 germ-line mutations.[23] The genetic testing was not done due to financial constraints and the unavailability of the test. Clinically, younger women have a higher incidence of such risk factors as a family history of breast cancer, and earlier menarche.[24] The study demonstrated that breast cancer arising in women under 30 years has a more aggressive profile than those of older patients.[25]

The pathological appearance in these two cases, showed invasive ductal carcinoma and we found a higher incidence of poorly differentiated tumours. In the first patient, it was Grade 3 and the second also was a grade 3 tumor.[25]

Breast cancers arising in young women tend to have more unfavourable pathologic features

and also aggressive subtypes. A greater portion of these women tend to have the Luminal type B, human epidermal growth factor receptor2 (HER2) positive or triple negative breast cancer,[17] as also seen in our case review.

Comparing the immunohistochemistry pattern, it revealed Estrogen, Progesterone, and HER2 neu receptor negative (Triple negative) in the first patient and Estrogen receptor, Progesterone negative, and HER2 neu positive in the second patient.[20-22] This reflects the aggressiveness of the disease.

Emotional factors such as fear, anxiety, and depression may contribute to the challenges encountered in managing young women with breast cancer. In our case presentation, one of the patients declined further treatment (mastectomy), probably due to fear and possible future stigma.[26] This we know may further affect morbidity and the prognosis of the disease if the appropriate treatment is not offered when required.

The review of conserving fertility before the commencement of treatment is crucial but, in our environment, it might be a challenge due to cultural, psychological and religious beliefs, this same concern was seen amongst the patients presented. They were both anxious, concerned about their body image and loss of hair prior to commencement of chemotherapy.[27] Thus, pre-chemotherapy counseling was offered to the patients. This further aided the consent to commence chemotherapy.

The young age related medical, and psychosocial issues are significant factors that these young women face following their diagnosis and treatment. These factors contribute to the greater risk of mental distress compared to older patients.[15,17] These factors include risk of future cancer, sexual dysfunction, hereditary disposition, infertility, premature menopause, body image concerns, schooling disruption and other comorbidities. These issues influence treatment decisions and outcomes.

The reason for poorer outcomes or prognosis experienced by young women is complex and multifactorial compared to older women. The reason may be that young women are likely to present with symptoms at a more advanced stage, just as seen in our case review. Another reason might be due to diagnostic delays and lack of screening among this population.[17,24]

CONCLUSION

It is a matter of great concern that the age at presentation for breast cancer is younger now as compared to the regular middle-aged presentation which was the previous pattern in several literatures. The association of family history and breast cancer may be a crucial factor for young women with breast cancer. Though a positive family history of breast cancer may be a predisposing factor, early presentation is still a very important factor in assessing the prognosis and quality of life of young women presenting with breast cancer. The late stage at presentation is a common feature seen among young women with the disease and further genetic testing (BRCA1 & BRCA2) will be needed on these patients. Management of breast cancer in the young adult group is complex and challenging, from the variant of molecular cancer subtype to the requirement of cytotoxic chemotherapy and desire for fertility.

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Authors' Contribution

All authors made significant contributions to the study and have approved the final version of the manuscript.

DECLARATIONS

Ethical Approval and Consent to Participate

Ethical approval not required for case report at my institution.

Consent for Publication

Written and informed consent was obtained from the patients for publication of this case report and any accompanying images.

Competing Interest

None

REFERENCES

1. Wilkinson L, Gathani T. Understanding breast cancer as a global health concern. Br J Radiol. 2022; Feb 1;95:(1130):20211033. doi: 10.1259/bjr.20211033. Epub 2021 Dec 14. PMID: 34905391; PMCID: PMC8822551.
2. MohdFaizal Ahmad, YodoShugishita, Yuki Suzuki- Takashi, ShinoShawada*et al.* Case Report: Young Adults with Breast cancer: A case series of Fertility Preservation Management and Literature Review. Font Med (Lausanne)2021; 8:670872. Published August 6, 2021, doi:10.3389/fmed 2021.670872
3. Akakpo PK, Imbeah EG, EduseiLNaporo S, Ulzen-Appiah K, Clegg-Lamptey JN *et al*. Clinicopathologic characteristics of early-onset breast cancer: a comparative analysis of cases from across Ghana. BMC Women's Health 23, 5 (2023). https://doi.org/10.1186/s12905-022-02142-w
4. Luis Costa, Rakesh Kumar, Cynthia Villaneal Garza *et al.* Diagnostic delays in breast cancer among young women: An emphasis on health care providers. www.journals.elsevier.com/the-breast. https://doi.org/10.1016/J.breast 2023 103623, Dec. 2023
5. Shavers VL, Harlan LC, Steven JL. Racial/ ethnic variation in clinical presentation, treatment and survival among breast cancer patients under age 25. Cancer 2013; 97: 134-147
6. GLOBOCAN 2020: Global Cancer Observatory. International Agency for Research on Cancer 2022. https://gco.iarc.fr/today/online-analysis-pie?v=2020&mode=cancer&mode_population=continents&population=900&populations=900&key=total&sex=0&cancer=39&type=0&statistic=5&prevalence=0&population_group=0&ages_group%5B%5D=0&ages_group%5B%5D=17&nb_items=7&group_cancer=1&include_nmsc=1&include_nmsc_other=1&half_pie=0&donut=0. Last accessed on 30th Nov 2022.
7. Batori M, Rugerri M, Chatelou E, Stranero A, Marriotta G, L. Palombi L, G. Casella, M. Basilo, M.C. Casella. Breast cancer in young women: Case Report and a review. European review for medical Pharmacological Sciences. 2006;10, 51-52.
8. Paluch-Shion, Cardoso F, Patuge AH, Abdukahir O, AzinthBianch G, Cardoso MJ, *et al.* ESO-ESMO Fifth international consensus for breast cancer

in young women. Ann Oncol 2022, Nov 33(11), 1097, -118 https:/doi.org/10.1016/J/annonc 2022.07.007

9. Lambertini M, Blondaux E, Perove F, Delmastro L. Improving adjuvant endocrine treatment tailoring premenopausal women with hormone positive breast cancer/Clinoncol 2020; 38(12):125-167. Doi: 10.1200/JCO.19-02242
10. Paluch-Shimon S, Cardoso F, Partridge AH, *et al.* ESO-ESMO 4th International Consensus Guidelines for Breast Cancer in Young Women (BCY4). Annals of Oncology: Official Journal of the European Society for Medical Oncology. 2020 Jun;31(6):674-696. DOI: 10.1016/j.annonc.2020.03.284. PMID: 32199930.ESO-ESMO 4th International conservative guideline for breast cancer in young women (Bay4) Ann Oncol (2020) 31(6)674-96. Doi: 10.1016/J.annonc 202003. 284
11. Mostkonz M. Breast at age specific growth rates and screening strategies. Radioly 1986. Oct 16(1)37-41 https:/doi/10.1148/radiology.161.1.3532 183
12. BrensterAM, Carey McGregor MM, Brown P. Epidemiology, biology and Treatment of Triple Negative Breast cancer. The Lancet Oncology 2014; 15(16):625-634
13. Newman CA. Breast Cancer Disparities High Risk Breast Cancer and African Ancestry. Surgical oncology clinics of North America 2014;23(3): 579-592
14. Benz CC. Impact of aging on the biology of breast cancer. Crit Rev OncolHematol. 2008;66(1):65-74. doi: 10.1016/j.critrevonc.2007.09.001. Epub 2007 Oct 18. PMID: 17949989; PMCID: PMC2626623.
15. Obajimi MO, Adeniji-sofolure AT, AO Oluwasola AO *et al.* Screening mammography in Ibadan our experience. Nigerian Journal of Basic and Clinical. 2015;12(2)
16. Mahe-Giagreco M, Ursin G, Sullevan Halley J, Bernstein L. Induced abortion abortion miscarriage and breast cancer risk of young women, cancer epidermiolBiomakers breast 2014; 2:209-214
17. Shoshana M Rosenburg, YueZheng, Katherine Rudy, Philip D Poorvu, Craig Snow et al. Helping we; Helping others: The Young women's Breast cancer study- A multisite Prospective Cohort study to advance the understanding of breast cancer diagnosed in women 40 years and younger. BMJ Open doi 10.1136-081157 july 2024
18. Kocic B, Filipovic S, Vrbic V, Pejcic I. Breast cancer in women under 40 years of age. J BUON. 2011;16(4):635-9. PMID: 22331714.
19. McAree B, O'Donnell ME, Spence A, Lioe TF, McManus DT, Spence RAJ. Breast cancer in women under 40years of age: A series of 57 cases from Northern Ireland. The Breast 2010; 19(2): 97-104 ISSN 0960-9776, https://doi.org/10.1016/j.breast.2009.12.002
20. Sukumar J, Gast K, Quiroga D, Lustberg M, Williams N. Triple-negative breast cancer: promising prognostic biomarkers currently in development. Expert Rev Anticancer Ther. 2021;21(2):135-148. doi: 10.1080/14737140.2021.1840984. PMID: 33198517; PMCID: PMC8174647.

21. da Silva JL, Cardoso Nunes NC, Izetti P, de Mesquita GG, de Melo AC. Triple negative breast cancer: a thorough review of biomarkers. Crit Rev OncolHematol. 2020; 145:102855.
22. Lehmann BD, Pietenpol JA. Clinical implications of molecular heterogeneity in triple negative breast cancer. Breast. 2015;24(Suppl 2): S36–40.
23. Heidi M. Sowter, Alan Ashworth, BRCA1 and BRCA2 as ovarian cancer susceptibility genes, Carcinogenesis, Volume 26, Issue 10, October 2005, Pages 1651–1656, https://doi.org/10.1093/carcin/bgi136
24. Lambertini M., Lambertini M, Kim HJ and Poorvu P. Editorial: Breast Cancer in Young Women: Dedicated Research Efforts Are Needed. Front. Oncol. 2022; 12:913167. doi: 10.3389/fonc.2022.913167
25. Azim HA, Partridge AH. Biology of breast cancer in young women. Breast Cancer Res 2014; 16: 427. https://doi.org/10.1186/s13058-014-0427-5
26. Goethals A, Rose J. Mastectomy. [Updated 2022 Oct 6]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK538212/
27. Hanna K, Mayden K. Chemotherapy Treatment Considerations in Metastatic Breast Cancer. J AdvPractOncol. 2021 Mar;12(Suppl 2):6-12. doi: 10.6004/jadpro.2021.12.2.11. Epub 2021 Mar 1. PMID: 34113474; PMCID: PMC8020942.