CASE REPORT
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Therapeutic approach to triple negative breast cancer in pregnant woman: case report

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ABSTRACT

Pregnancy-associated breast cancer includes tumors that occur during pregnancy, lactation, or within one year postpartum. It is a rare clinical condition, with an incidence ranging from 1:3,000 to 1:10,000 pregnancies. Therapeutic strategies take into account factors such as tumor staging, patient characteristics, and gestational age. Radical mastectomy was the main surgical intervention in triple-negative breast cancer. Currently, studies suggest that mastectomy should not be mandatory for the treatment of breast cancer solely due to the presence of pregnancy, and breast conservation is discussed whenever possible. Despite the aggressive biology of the triple-negative subtype, approximately 40% of patients have tumors that are highly sensitive to chemotherapy, achieving a complete pathological response. The objective of this study was to report a clinical case of breast cancer in a young pregnant patient, describing the clinical presentation, histological characteristics, as well as the diagnostic methods and therapeutic measures adopted, with the aim of contributing didactically to the academic community, offering theoretical support for the improvement of clinical practice in the management of triple-negative breast cancer during and after the gestational period.

KEYWORDS: therapeutic approach; triple negative breast cancer; pregnant.

INTRODUCTION

Breast cancer is a heterogeneous disease with great variation in its morphological and molecular characteristics and in its clinical response. Worldwide, it is the most common cancer in women, being a frequent cause of cancer death in this population, with an estimated 660,000 deaths for the year 2024[1]. Pregnancy-associated breast cancer, by definition, includes tumors that develop during pregnancy, lactation or within one year of the postpartum period. However, some studies suggest extending this concept to up to 5 - 10 years postpartum given the clinical implications of this period in recurrence and mortality from breast cancer[2]. Its incidence ranges from 1:3,000 to 1:10,000 pregnancies, being a rare clinical condition, although there is a tendency for it to grow, since women have been delaying motherhood[3,4].

It is known that pregnancy and lactation promote the creation of a microenvironment with high carcinogenic potential in the breast through remodeling of the glandular architecture and high hormone concentration, which thus favors tumor proliferation[5,6]. Despite this, the majority of breast cancers associated with pregnancy are not hormone-dependent, with triple negative being the most prevalent subtype in this population[5].

Diagnosis is a clinical challenge as there is a transposition of signs and symptoms resulting from physiological changes during pregnancy, such as increased breast density and volume, with the repercussions of neoplasia, in addition to restrictions on the use of imaging tests. This makes screening and early detection of the problem difficult[2,5].

The therapeutic approach should be multidisciplinary, defining the modality and sequence of treatment depending on the characteristics related to the tumor and the gestational age, as well as the patient's preferences[2]. For decades, radical mastectomy was the main surgical intervention for triple-negative breast cancer. However, this procedure implies numerous repercussions in the patient's life, such as the development of lymphedema and other postoperative complications, decreased self-esteem, impact on femininity and sexuality, and the development of psycho-emotional disorders[7].

Currently, there are promising methods of organ preservation and prosthesis surgery, the feasibility and efficacy of which are being discussed[8]. Furthermore, despite the aggressive biology of the triple-negative subtype, approximately 40% of patients have tumors that are highly sensitive to chemotherapy, achieving a complete pathological response[9]. However, because it is

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a relatively rare indication, therapeutic approaches are mostly derived from large trials in non-pregnant women. Thus, evidence that takes into account the repercussions on the mother-fetus binomial remains scarce or controversial[10].

The objective of this study was to report a clinical case of breast cancer in a young pregnant patient, discussing the clinical presentation, histological characteristics, as well as the diagnostic methods and therapeutic measures adopted. The aim was to contribute didactically to the academic community, offering theoretical support for the improvement of clinical practice in the management of triple-negative breast cancer during the gestational period.

CASE REPORT

This study was approved by the institution's ethics committee under the Certificate of Presentation for Ethical Appreciation (CAAE): 80536624.5.0000.5176.

A 26-year-old female patient, GIIIPIIA0, in the second trimester of pregnancy, was treated at a hospital in the state of Paraíba, Brazil, in November 2022, complaining of a lump in her left breast for six months. After core needle biopsy and immunohistochemistry analysis, the patient was diagnosed with infiltrating ductal carcinoma in the left breast, with negativity for estrogen and progesterone receptors, negative HER2 and KI67 of 70%. At 24 weeks of gestational age, she started a chemotherapy regimen with cyclophosphamide and doxorubicin, in four cycles, with intervals of 21 days. The doses varied between 951.51 and 1141.95 mg for cyclophosphamide and 95.15 mg and 114.19 mg for doxorubicin, with the treatment being suspended two weeks before delivery.

In April 2023, she returned for evaluation, when a breast ultrasound (USG) was requested, which revealed a nodular image with BI-RADS 6 in the left breast, markedly hypoechoic, with irregular contours, with discrete, punctiform and peripheral vascularization on Doppler, heterogeneous content and a combined pattern of posterior acoustic reinforcement, measuring 4.53 x 3.35 cm and 2.18 cm from the skin to the center of the nodule and extending to the subdermal region (Figure 1). The right breast showed no changes. In addition, the retromammary fascia had preserved integrity and the armpits were without abnormalities in both breasts. In that same month, at 38 weeks of gestational age, the patient underwent cesarean section, which occurred uneventfully, with the birth of a male neonate, with good vitality. Breastfeeding was not recommended from the first postpartum moment.

Three weeks after the cesarean section, a new neoadjuvant treatment plan was started with a weekly regimen of carboplatin and paclitaxel, in 12 sessions. In the first eight sessions, carboplatin 285 mg and paclitaxel 144 mg were used. The patient developed nephrotic colic, and the dose of the four subsequent sessions was reduced by 20%. In a new radiological evaluation in September 2023, dimensions of the lesion became 1.78 cm (in its largest diameter) and 1.77 cm from the skin, maintaining the characteristics of the previous ultrasound examination. The following month, a quadrantectomy was performed with evaluation of the sentinel lymph node, which concluded that it was free of neoplasia. The material received for histopathological study included a left breast segment measuring 12.0 x 8.5 x 5.0 cm, with a white-yellowish nodular tumor lesion measuring 2.5 x 1.7 cm, which was classified as grade III invasive ductal carcinoma, with free surgical margins.

In November 2023, she began adjuvant chemotherapy with capecitabine for eight cycles. Three months later, the patient returned for consultation reporting nodules in the operated breast, and a new ultrasound was requested, which showed local recurrence with the presence of 1.04 cm nodules in the union of the upper quadrants and 1.2 cm in the upper lateral quadrant of the left breast. In April 2024, the patient began adjuvant radiotherapy. She then returned for preoperative evaluation, and a left breast mastectomy with immediate prosthesis reconstruction was proposed, which was then performed in June 2024. The surgical specimen was sent for histopathological study. The material received for examination contained a product weighing 710 g and measuring 18 x 16 x 5.0 cm. The sections revealed two irregular, yellowish-white, firm-elastic areas measuring 0.9 x 0.8 and 0.4 x 0.3 cm, 4.0 and 3.5 cm from the deep margin, respectively, and 1.2 cm apart. The analysis showed residual invasive ductal carcinoma, with neoplasia present in two of eight slides, with the largest focus measuring 0.8 cm.

In September 2024, the patient began adjuvant chemotherapy with a combination of carboplatin and docetaxel, in six sessions, with a 21-day interval. In the first session, she used carboplatin 960 mg and docetaxel 138 mg. In subsequent sessions, there was an 80% reduction in the dose due to the patient's fever, myalgia and fatigue after the first cycle. She is currently undergoing chemotherapy treatment, with a cranial tomography, abdominal MRI and chest X-ray showing no evidence of metastasis.

DISCUSSION

In this article, we present the case of a patient diagnosed with triple-negative breast cancer detected during pregnancy, whose course presented clinical challenges that interfered with the antineoplastic approach.

Triple-negative breast cancer is defined by no or minimal staining for estrogen and progesterone receptors and lack of overexpression of human epidermal growth factor receptor 2 (HER 2), which is associated with a higher risk of recurrence and worse overall prognosis[8]. This subtype is associated with aggressive behavior and is more common in pregnant patients than in non-pregnant patients. Therefore, therapeutic strategies should take into account factors such as tumor staging, patient characteristics, and gestational age[2].

For patients in the first trimester, treatment options are limited during the first weeks of pregnancy, since endocrine treatments are not viable and chemotherapy is prohibited during

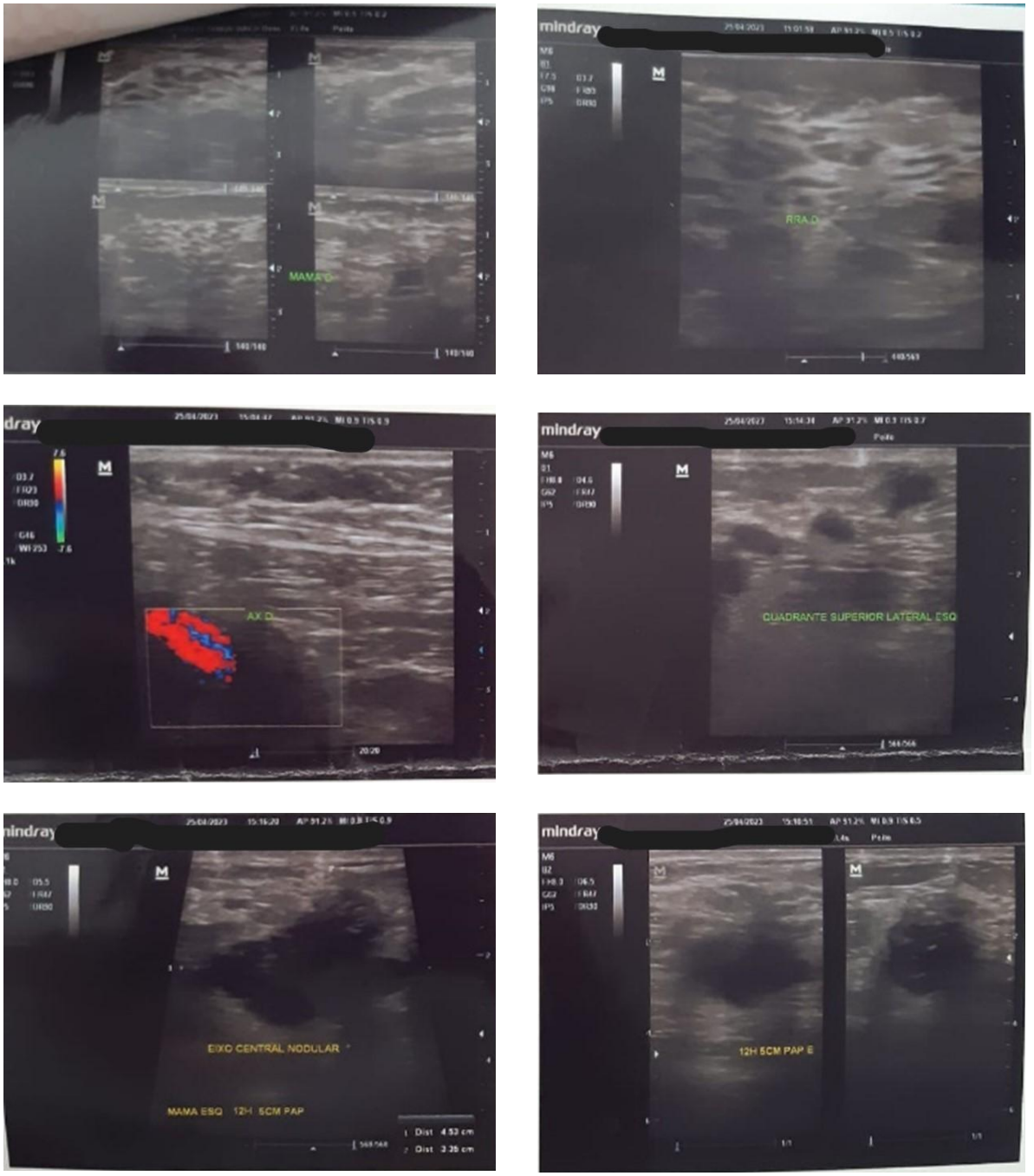

Figure 1. Breast ultrasound revealing a nodular image with BI-RADS 6 in the left breast, markedly hypoechoic, with irregular contours, with discrete, punctiform and peripheral vascularization on Doppler, with heterogeneous content and a combined pattern of posterior acoustic enhancement, measuring 4.53 x 3.35 cm.

this period due to teratogenicity. Surgical treatment, in turn, is considered safe at any time during pregnancy[11]. In patients diagnosed with breast cancer in the second or third trimester, as in the case described, conservative therapeutic modalities are recommended, as is the case for most non-pregnant patients[2].

Regarding systemic therapy, chemotherapy can be neoadjuvant or adjuvant, depending on the overall treatment plan[2]. The greatest experience with chemotherapy for breast cancer during pregnancy comes from regimens that use various combinations of doxorubicin, cyclophosphamide and fluorouracil[11]. The taxanes, such as paclitaxel and docetaxel used in this case, are a group of antineoplastic drugs with antimitotic action that appear to improve the prognosis of women with breast cancer, especially those with lymph node involvement. However, there is limited data on their use during pregnancy[12].

Furthermore, the inclusion of platinum agents, such as carboplatin, as neoadjuvant chemotherapy for triple-negative breast

cancer remains controversial because, despite the improvement in pathological complete response, the long-term results remain unknown[13]. Capecitabine and olaparib, as adjuvant therapy, have shown an improvement in the prognosis of patients with residual HER2-negative invasive breast cancer after neoadjuvant chemotherapy[14]. It is worth noting that chemotherapy should be suspended at least three weeks before delivery to allow a window for maternal and fetal bone marrow recovery between chemotherapy cycles, thus avoiding hematologic complications during delivery[3,15].

Regarding the surgical approach, it can be performed safely during any stage of pregnancy[16]. The timing of the procedure should be determined based on the gestational age, the characteristics of the patient and the tumor. However, it is worth noting that in cases of elective surgery, it is preferable to postpone it until after delivery[2]. For decades, mastectomy was considered the standard treatment for patients with breast cancer during pregnancy[17]. However, studies suggest that mastectomy should not be mandatory for the treatment of breast cancer simply because of the presence of pregnancy, and that breast conservation should be discussed whenever possible[16]. Therefore, as in non-pregnant patients, the ideal choice of procedure is based on a shared decision made by the patient and the physician after discussing the risks and benefits between mastectomy and conservative surgery in relation to long-term survival, the risk of local recurrence and the impact on the aesthetic result and overall quality of life[11,17].

In the perioperative context, sentinel lymph node testing is the standard procedure for axillary evaluation in patients with early-stage breast cancer and negative clinical examination, thus helping to define the need for axillary lymphadenectomy[18]. However, during the gestational period, adherence to this procedure is still not a consensus in the literature, and there is not enough data to make basic recommendations for its use in this scenario, making it necessary to individualize the cases of indication[11].

Regarding radiotherapy, it is rarely indicated in pregnant women with breast cancer, since fetal tissues are sensitive to radiation, and the risks of toxicity depend on gestational age[10]. In general, it is indicated in patients who opt for breast conservation or who require post-mastectomy radiation. The start of treatment is essential, since patients undergoing surgery with adjuvant radiation should start radiotherapy within 8 to 12 weeks to maintain disease-free survival and avoid an increased risk of local recurrence[17].

Breast reconstruction after mastectomy is a critical element in the treatment of breast cancer, especially at a young age. The literature demonstrates the reduction of the emotional impact of the injury in immediate reconstruction[4]. However, in order to reduce the time of anesthesia and complications of surgery, delayed reconstruction is preferable[19]. Therefore, an individualized and multidisciplinary strategy is key in the treatment of these women[4].

It is known that termination of pregnancy does not change the prognosis and that induced abortion in this situation is not permitted by Brazilian law. Therefore, patients must be monitored in a high-risk obstetrics unit, and the timing of delivery must take fetal maturation into account[3]. Thus, the preferred route of delivery is vaginal if there are no contraindications, and oncological treatment can be resumed immediately after delivery. That said, it is extremely important that the patient receives obstetric, oncological, pediatric, radiotherapy, ethical and psychological guidance during treatment, since this has a significant impact on pregnancy, postpartum, breastfeeding and even the woman's reproductive life[2].

Therefore, a multidisciplinary approach to these patients is essential to ensure good care and maternal and fetal well-being. As with non-pregnant patients, every effort should be made to provide the patient with maximum benefit and the best prognosis in the gestational context[20].

CONCLUSIONS

This report highlights the complexity and therapeutic challenges involved in the management of triple-negative breast cancer in a pregnant patient, emphasizing the importance of a multidisciplinary approach. Given that the incidence of breast cancer during pregnancy is rare, it is essential to develop more reports and studies documenting similar cases, with the aim of improving treatment guidelines and offering better therapeutic options for these cases.

AUTHORS' CONTRIBUTION

TPS: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Visualization, Writing – original draft, Writing – review & editing. VRL: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Visualization, Writing – original draft, Writing – review & editing. ATU: Methodology, Project administration, Supervision, Validation, Visualization, Writing – review & editing.

REFERENCES

1. Brasil. Instituto Nacional de Câncer. Controle do Câncer de Mama: Conceito e Magnitude [Internet]. Rio de Janeiro; 2022 [cited on 2024 May 13]. Available from: https://www.gov.br/inca/pt-br/assuntos/gestor-e-profissional-de-saude/controle-do-cancer-de-mama/conceito-e-magnitude.

2. Boere I, Lok C, Poortmans P, Koppert L, Painter R, Heudvel-Eibrink M, et al. Breast cancer during pregnancy: epidemiology, phenotypes, presentation during pregnancy and therapeutic modalities. Best Pract Res Clin Obstet Gynaecol. 2022;82:46-59. https://doi.org/10.1016/j.bpobgyn.2022.05.001

3. Carvalho CM, Cândido EB, Furtado RS, Almeida JVQ, Silva Filho AL. Aspectos clínicos do câncer durante o período gestacional: desafios diagnósticos e terapêuticos. Femina. 2022;50(10):582-88.
4. Liberale V, Tripodo E, Ottino L, Biglia N. Surgery on breast cancer in pregnancy. Transl Cancer Res. 2019;8:s493-s502. https://doi.org/10.21037/tcr.2019.07.16
5. Ruiz R, Herrero C, Strasser-Weippl K, Touya D, Louis J, Bukowski A, et al. Epidemiology and pathophysiology of pregnancy-associated breast cancer: A review. The Breast. 2017;35:136-41. https://doi.org/10.1016/j.breast.2017.07.008
6. Thorne C, Lee AV. Cross Talk Between Estrogen Receptor and IGF Signaling in Normal Mammary Gland Development and Breast Cancer. Breast Dis. 2003;17:105-14. https://doi.org/10.3233/bd-2003-17110
7. Aerts L, Christianes MR, Enzlin P, Neven P, Amant F. Sexual functioning in women after mastectomy versus breast conserving therapy for early-stage breast cancer: a prospective controlled study. The Breast. 2014;23(5):629-36. https://doi.org/10.1016/j.breast.2014.06.012
8. Baranova A, Krasnoselskyi M, Starikov V, Kartashov S, Zhulkevych I, Vlasenko V, et al. Triple-negative breast cancer: current treatment strategies and factors of negative prognosis. J Med Life . 2022;15(2):153-61. https://doi.org/10.25122/jml-2021-0108
9. Symmans WF, Wei C, Gould R, Yu X, Zhang Y, Liu M, et al. Long-Term Prognostic Risk After Neoadjuvant Chemotherapy Associated With Residual Cancer Burden and Breast Cancer Subtype. J Clin Oncol. 2017;35(10):1049-60. https://doi.org/10.1200/JCO.2015.63.1010
10. Loibl S, Azim Jr. HA, Bachelot T, Berveiller P, Bosch A, Cardonick E, et al. ESMO Expert Consensus Statements on the management of breast cancer during pregnancy (PrBC). Ann Oncol. 2023;34(10):849-66. https://doi.org/10.1016/j.annonc.2023.08.001
11. National Comprehensive Cancer Network. Breast Cancer: Clinical Practice Guidelines in Oncology [Internet]. National Comprehensive Cancer Network; 2024 [cited on 2024 Jul 27]. Available from: https://jnccn.org/view/journals/jnccn/22/5/article-p331.xml.
12. Monteiro DLM, Trajano AJB, Menezes DCS, Silveira NLM, Magalhães AC, Miranda FRD, et al. Câncer de mama na gravidez e quimioterapia: revisão sistemática. AMB Rev Assoc Med Bras. 2013;59(2):174-80. https://doi.org/10.1016/j.ramb.2012.10.003
13. Mayer IA, Zhao F, Arteaga CL, Symmans WF, Park BH, Burnette BL, et al. Randomized Phase III Postoperative Trial of Platinum-Based Chemotherapy Versus Capecitabine in Patients With Residual Triple-Negative Breast Cancer Following Neoadjuvant Chemotherapy: ECOG-ACRIN EA1131. J Clin Oncol. 2021;39(23):2539-51. https://doi.org/10.1200/JCO.21.00976
14. Geyer CE, Sikov WM, Huober J, Rugo HS, Wolmark N, O'Shaughnessy J, et al. Long-term efficacy and safety of addition of carboplatin with or without veliparib to standard neoadjuvant chemotherapy in triple-negative breast cancer: 4-year followup data from BrighTNess, a randomized phase III trial. Ann Oncol. 2022;33(4):384-94. https://doi.org/10.1016/j.annonc.2022.01.009
15. Wolters V, Heimovaara J, Maggen C, Cardonick E, Boeré I, Lenaerts L, et al. Management of pregnancy in women with cancer. Int J Gynecol Can. 2021;31(3):314-22. https://doi.org/10.1136/ijgc-2020-001776
16. Toesca A, Gentilini O, Peccatori F, Azim Jr HA, Amant F. Locoregional treatment of breast cancer during pregnancy. Gynecol Surg. 2014;11(4):279-84. https://doi.org/10.1007/s10397-014-0860-6
17. Rojas KE, Bilbro N, Manasseh DM, Borgen PI. A Review of Pregnancy-Associated Breast Cancer: Diagnosis, Local and Systemic Treatment, and Prognosis. J Womens Health. 2019;28(6):778-84. https://doi.org/10.1089/jwh.2018.7264
18. Matthes AGZ, Vieira RAC, Melo FY, Mendonça MLH, Bailão Jr A, Haikel RL, et al. Biópsia do linfonodo sentinela para o câncer de mama com anestesia local. Rev Bras Mastologia. 2011;20(4):170-6.
19. Omranipour R. Cirurgia de câncer de mama associado à gravidez. Springer. 2020:95-9. https://doi.org/10.1007/978-3-030-41596-9_12
20. Voulgaris E, Pentheroudakis G, Pavlidis N. Cancer and pregnancy:acomprehensivereview.SurgOncol.2011;20(4):e175-85. https://doi.org/10.1016/j.suronc.2011.06.002