



DOI: 10.32768/abc.20196296-99

## Diagnosis and Management of Metastatic Breast Cancer During Pregnancy by a Multidisciplinary Team: A Case Report

Mahdis Mohamadianamiri<sup>a</sup>, Majid Aklamli<sup>b</sup>, Seyedeh Fahimeh Shojaei<sup>\*c</sup><sup>a</sup> Department of Obstetrics and Gynecology, Firoozgar Clinical Research Development Center, Iran University of Medical Sciences, Tehran, Iran<sup>b</sup> Department of Anesthesiology, Akbar Abadie Hospital, Iran University of Medical Sciences, Tehran, Iran<sup>c</sup> Clinical Psychologist, Firoozgar Clinical Research Development Center, Iran University of Medical Sciences, Tehran, Iran

### ARTICLE INFO

**Received:**  
20 January 2019  
**Revised:**  
10 February 2019  
**Accepted:**  
19 February 2019

**Key words:**  
Metastatic breast cancer,  
pregnancy,  
diagnosis,  
management.

### ABSTRACT

**Background:** When breast cancer is diagnosed during pregnancy or within the first year after delivery, the condition is named as pregnancy-associated breast cancer (PABC). Breast cancer during pregnancy is a devastating situation for the patient, her family, and the medical team. Providing guidance for diagnosis and treatment of PABC, we report a case along with review of the literature.

**Case presentation:** Here we present a 31-year-old pregnant woman with low back pain who was referred to the gynecology ward. She was at 25 weeks and 6 days pregnancy. After workup, it was discovered that she had a lytic lesion in her spine. Further workup revealed that she had metastatic breast cancer with the pathology of invasive ductal carcinoma. After consultation with a multidisciplinary team (a gynecologist, an oncologist, a radiotherapist, a hematologist-oncologist, and a neurosurgeon), we terminated the pregnancy and put her on radiotherapy for the spine metastasis and systemic therapy. Also, we reviewed 36 pregnant patients with primary or recurrent breast cancer who were managed with outpatient chemotherapy, surgery, or surgery plus radiation therapy. Care was provided by medical oncologists, breast surgeons, and perinatal obstetricians.

**Conclusion:** Since there are no sufficient data in the literature to guide the development of standard protocols for management of PABC patients (specially in metastatic disease), pregnant women must be followed up by a multidisciplinary team, and each case should be managed considering the gestational age and the stage of cancer.

### Introduction

Breast cancer is the second most prevalent malignancy affected by pregnancy. Breast cancer in a pregnant woman is more distressing for the patient and her family than in a nonpregnant woman. The management of pregnancy-associated breast cancer (PABC) requires a multidisciplinary team as well as psychological support. The incidence rate for PABC

is estimated to be 1 in 3000 pregnancies.<sup>1</sup>

Breast cancer is usually hormone-dependent; therefore, abortion is often recommended during the first trimester to avoid tumor growth due to estrogen and progesterone increase. However, termination of pregnancy does not seem to improve patient survival.<sup>2-5</sup> Because of advanced maternal age, the incidence of PABC is expected to increase.<sup>6,7</sup> Due to dense breast tissue during pregnancy, examination of breasts is difficult, which can prevent a breast mass from being detected by both the patient and the physician.<sup>8,9</sup> Ultrasonography is the first approach when facing a breast mass in a pregnant woman.<sup>8-11</sup> Mammography is less sensitive and has a high false-negative rate, but it also plays a key role in

### \* Address for correspondence:

Seyedeh Fahimeh Shojaei, MS  
Address: Firoozgar Clinical Research Development Center (FCRDC), Iran University of Medical Sciences, No. 73, Shahid Hassankhani Alley, Baghnardeh St., Eslamshahr City, Tehran Province, 3316995355, Iran  
Fax: +98 21 56122224  
Email: [Shojaee.fahimeh@yahoo.com](mailto:Shojaee.fahimeh@yahoo.com)



the detection of PABC.<sup>11</sup>

Breast cancer during pregnancy can be optimally treated using a combination therapy approach, including surgical resection, radiation therapy, systemic chemotherapy, and also proper prenatal care. While radiation therapy is contraindicated in pregnancy and certain chemotherapy agents have been shown to cause malformation in the embryo during the first trimester, chemotherapy has been used successfully without visible harm to the mother or her unborn child.<sup>12,13</sup>

Here we present a case of PABC. Our aim is to show that PABC should be followed up by a multidisciplinary team and that each case should be evaluated separately depending on the gestational age and stage of cancer.

### Case presentation

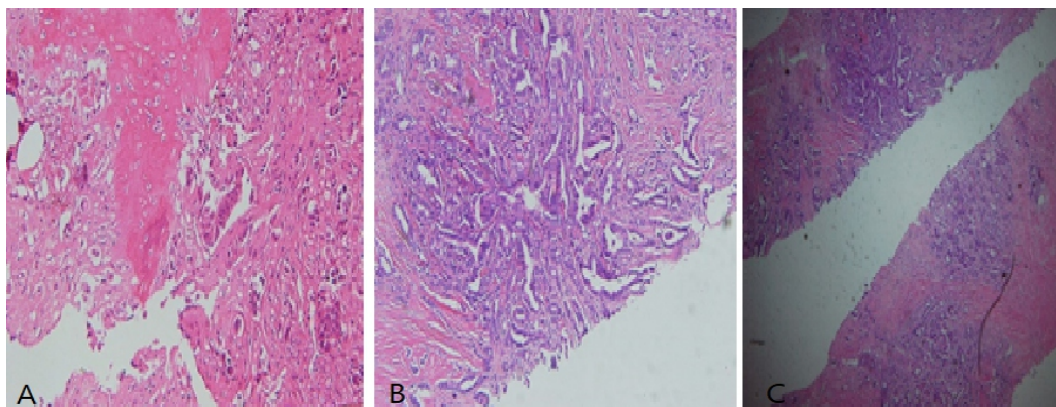
A 31-year-old pregnant woman came to our hospital with low back pain, lower limb paralysis and walking inability. She had had the backache since 2 months before presenting to the hospital, and a rheumatologist had given corticosteroid under the diagnosis of ankylosing spondylitis. Her gestational age was 25 weeks and 6 days.

After workup by the neurosurgery team, lytic

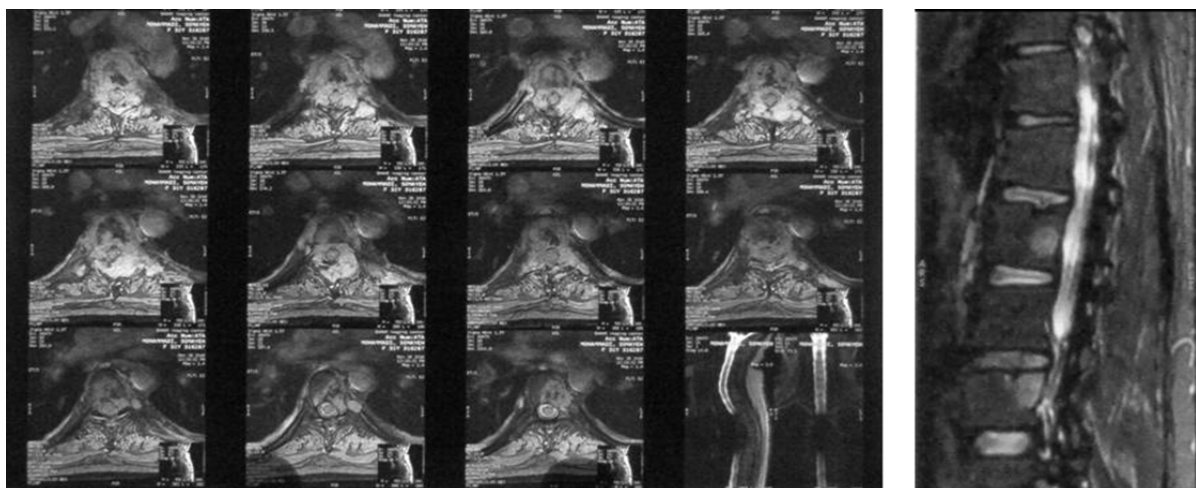
lesions were found in the spinal MRI in T10 to L4. There was no palpable mass in the breast in the physical examination.

Laminectomy and decompression were performed as soon as possible, and the pathology report suggested metastatic carcinoma of breast origin. Sonography demonstrated a 23×15 mm lesion in the left breast and a 26×86 mm lymph node in her left axillary. Then, core needle biopsy of the breast was done and the pathological examination showed invasive ductal carcinoma ER positive and PR positive and HER2-negative.

She had a family history of breast cancer in her 30-year-old sister. Metastatic workup showed isolated spine metastasis. Chest x-ray and abdominal and pelvic sonography were normal. The next step was radiotherapy to the spine, so pregnancy termination was inevitable. The medical consultation team including a neurosurgeon, a radiotherapist, an oncologist, and a gynecologist gathered for decision making. Finally, after consulting with patient and her husband, cesarean section was performed. At the 27<sup>th</sup> week of pregnancy, just one day before radiotherapy and after corticosteroid administration, a baby girl weighing 450 g with Apgar score 5 was delivered.



**Figure 1.** Invasive ductal carcinoma grade 2 to 3 infiltrating sclerotic breast tissue. A: metastatic ductal carcinoma infiltrating the bone, B and C: Core needle biopsy



**Figure 2.** Spinal metastasis from breast



The mother was then treated with radiation therapy and chemotherapy, and surgery of breast was not necessary at that time. After treatment, that patient was followed up for .... months. There is no recurrence was found during the follow up period. Also, the baby is normal with no significant problem.

### Discussion

Breast cancer is one of the most common cancers in women and can invade many other organs.<sup>14</sup> The goal of treatment for breast cancer in pregnant and nonpregnant women is the same, namely, to control the tumor locally and preventing the disease from spreading in the body. During pregnancy, some treatment modalities should be modified because of adverse effects on the fetus.<sup>15</sup>

Radiation therapy is contraindicated during pregnancy and is not considered a safe treatment. The main risks associated with this treatment are the increased odds of bearing babies with mental retardation (when administered after the 8<sup>th</sup> week of pregnancy) and an increased risk of childhood cancer.<sup>16-18</sup>

Rovera et al. reported six breast cancer patients who were diagnosed during pregnancy (median age: 34 years; range: 28–44 years) and six other patients whose breast cancer was discovered during breastfeeding. In all cases, the histological type of tumor was invasive ductal carcinoma, 10 patients with grade 3 and 2 patients with grade 2. Ten patients underwent breast-conserving surgery. Eleven of 12 patients received adjuvant chemotherapy and 1 patient received both adjuvant and neoadjuvant therapies. In 3 cases, radiation therapy was also performed after delivery. In all cases, healthy babies were born. Nine of 12 patients were alive and disease-free after a median follow-up of 20 months (range 3–52 months). The other 3 patients died of systemic progression of the disease. In conclusion, there is not sufficient evidence to help with the development of standard protocols. Pregnant women must be followed by a multidisciplinary team.<sup>16</sup>

Berry et al. managed 24 pregnant patients with primary (n = 22) or recurrent (n = 2) breast cancer with a combination of outpatient chemotherapy regimens, surgery, or surgery plus radiation therapy over an 8-year period. Of the 22 patients with primary breast cancer, 18 received modified radical mastectomy and 2 were treated with segmental mastectomy with postpartum radiation therapy. A median of 4 cycles of combination chemotherapy was performed during pregnancy, with no chemotherapy-related antepartum complications. The mean gestational age at delivery was 38 weeks. All of the neonates had normal birth weights and were healthy. The authors concluded that treatment of breast cancer with chemotherapy during the second and third trimesters of pregnancy is completely safe.<sup>19</sup>

Our case was a stage IV breast cancer patient with isolated spinal metastasis. Because she needed radiotherapy, we terminated the pregnancy to avoid possible radiotherapy side effects on the fetus. Although the gestational age was 25 weeks and 6 days, waiting for the development of the lungs in the fetus was impossible.

In conclusion, management of PABC patients requires a multidisciplinary team as well as psychological support. Diagnosis of cancer during pregnancy remains an unusual event. However, its possibility should always be considered, and all cases should be referred to specialized centers so that the best decision is reached through counseling and appropriate medical and psychological support is provided. Also, we should consider the parent's preferences. The diagnosis of breast cancer during pregnancy has a high psychological impact on the patient's life, her family, and even the multidisciplinary team. The difficult management of this situation necessitates advice from other specialties to make the best decision. The decision of the patient, the stage of cancer, and gestational age should always be considered.

### Acknowledgments

The authors thank Firoozgar Clinical Research Development Center (FCRDC), Firoozgar Hospital, Iran University of Medical Sciences, for their assistance.

### Ethical Consideration

In accordance with medical ethics committee requirements, written informed consent was provided by the patient for the publication of this article and the accompanying images.

### Conflict of Interest

None of the authors has any potential conflict of interest.

### References

1. Shlensky V, Hallmeyer S, Juarez L, Parilla BV. Management of breast cancer during pregnancy: are we compliant with current guidelines? *American Journal of Perinatology Reports*. 2017;7(01):e39-e43.
2. Hubay CA, Barry FM, Marr CC. Pregnancy and breast cancer. *The Surgical clinics of North America*. 1978;58(4):819-31.
3. Ribeiro G, Jones D, Jones M. Carcinoma of the breast associated with pregnancy. *British journal of surgery*. 1986;73(8):607-9.
4. Nugent P, O'Connell TX. Breast cancer and pregnancy. *Archives of Surgery*. 1985;120(11):1221-4.
5. Barnavon Y, Wallack M. Management of the pregnant patient with carcinoma of the breast. *Surgery, gynecology & obstetrics*. 1990;171(4):



- 347-52.
6. Kosary CL. SEER cancer statistics review, 1973-1992: tables and graphs 1996.
  7. Donegan W. Common benign conditions of the breast in: Donegan WL. Cancer Breast WB Saunders Co. 1995:88-9.
  8. Bonnier P, Romain S, Dilhuydy JM, Bonichon F, Julien JP, Charpin C, et al. Influence of pregnancy on the outcome of breast cancer: a case-control study. Societe Francaise de Senologie et de Pathologie Mammaire Study Group. *Int J Cancer*. 1997;72(5):720-7.
  9. Pavlidis N, Pentheroudakis G. The pregnant mother with breast cancer: diagnostic and therapeutic management. *Cancer Treat Rev*. 2005;31(6):439-47.
  10. Amant F, Loibl S, Neven P, Van Calsteren K. Breast cancer in pregnancy. *Lancet*. 2012;379(9815):570-9.
  11. Mazonakis M, Varveris H, Damilakis J, Theoharopoulos N, Gourtsoyiannis N. Radiation dose to conceptus resulting from tangential breast irradiation. *Int J Radiat Oncol Biol Phys*. 2003;55(2):386-91.
  12. Gililland J, Weinstein L. The effects of cancer chemotherapeutic agents on the developing fetus. *Obstet Gynecol Surv*. 1983;38(1):6-13.
  13. Wiebe VJ, Sipila PE. Pharmacology of antineoplastic agents in pregnancy. *Crit Rev Oncol Hematol*. 1994;16(2):75-112.
  14. Mohamadianamiri M, Ameri A, Sourati A, Shojaei SF, Bozorgzade Vosta Kolaei S. Ovarian Papillary Serous Cancer Recurrence with Ipsilateral Isolated Axillary Lymph node Metastasis as an Unusual Presentation: A Case Report. *The Iranian Journal of Obstetrics, Gynecology and Infertility*. 2018;21(5):108-11.
  15. Van der Giessen P-H. Measurement of the peripheral dose for the tangential breast treatment technique with Co-60 gamma radiation and high energy X-rays. *Radiotherapy and oncology*. 1997;42(3):257-64.
  16. Rovera F, Chiappa C, Coglitore A, Baratelli GM, Fachinetti A, Marelli M, et al. Management of breast cancer during pregnancy. *International Journal of Surgery*. 2013;11:S64-S8.
  17. Kal HB, Struikmans H. Radiotherapy during pregnancy: fact and fiction. *The lancet oncology*. 2005;6(5):328-33.
  18. Behrman RH, Homer MJ, Yang W, Whitman GJ. Mammography and fetal dose. *Radiology*. 2007;243(2):605; author reply -6.
  19. Berry DL, Theriault RL, Holmes FA, Parisi VM, Booser DJ, Singletary SE, et al. Management of breast cancer during pregnancy using a standardized protocol. *Obstetrical & gynecological survey*. 1999;54(10):620-1.