

Case Report

Large Ascites in a Cirrhotic Patient Reveal an Isolated and Late Metastasis of Ductal Breast Cancer: A Case Study

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Keywords

Breast cancer · Invasive ductal carcinoma · Malignant ascites · Peritoneal carcinomatosis · Case report

Abstract

Breast cancer is the most prevalent cancer in women worldwide, and its prevalence has increased since the introduction of screening programs. Most cases are discovered at an early stage; however, despite effective treatment, some cases progress to metastasis. The most common breast cancer metastatic locations are the bone, liver, and lungs. Ascites malignant due to peritoneal involvement is a rare manifestation of metastatic breast cancer. After 8 years of well-controlled breast cancer, we report a 54-year-old woman who presents with malignant ascites and is known to have cirrhosis of the liver.

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Introduction

Breast cancer is the most common malignancy in women, particularly invasive ductal carcinoma accounting for 76% of affected individuals, followed by invasive lobular breast cancer cases accounting for 8% [1, 2]. Metastasis frequently occurs in the bones, liver, lungs, and brain, in order of prevalence; however, numerous reports and case studies have demonstrated metastasis in atypical places, including the gastrointestinal (GI) tract, the peritoneum, the retroperitoneum, and the genitourinary tract [3, 4]. 9.3% of women with invasive

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breast cancer manifested with distant metastasis at the time of diagnosis or developed metastases at a median follow-up of 83 months, according to a retrospective analysis [4]. Regarding peritoneal carcinomatosis specifically, peritoneal metastasis from breast cancer has a prevalence between 0.5% and 0.7%, which represents 7.6% of women affected by distant metastasis overall, and only 18.2% of these instances are isolated metastases [4, 5]. Patients with peritoneal carcinomatosis tend to be younger, have a lower BMI, develop metastasis to the peritoneum substantially later than patients with non-peritoneal metastases (77.1% vs. 60%), and have the worst prognosis, along with brain metastasis [4]. In addition, multivariate logistic regression analyses demonstrated that high grading, lobular invasive type, and advanced TNM staging (containing both large tumor size and high lymph node involvement) are significant predictors of peritoneal metastatic development.

Peritoneal carcinomatosis is a life-threatening disease with a high death rate and poor prognosis when identified, as well as inadequate data on the efficacy of the treatment offered to patients with this condition. This report describes the case of a 54-year-old woman with liver cirrhosis and recurrent ductal carcinoma in situ of the left breast, who presented with GI symptoms and was diagnosed with isolated and late metastasis of ductal breast cancer in the peritoneum 7 years after her initial diagnosis of primary breast cancer.

Case Presentation

A 54-year-old female with a history of diabetes mellitus, subclinical hypothyroidism, and liver cirrhosis, Child-Pugh class C, due to nonalcoholic fatty liver disease complicated by moderate ascites on furosemide 40 mg and spironolactone 100 mg, and non-bleeding esophageal varices for which she was prescribed a nonselective β -Blocker.

In 2014, she was diagnosed with stage IIA (cT2cN0M0) left breast cancer, high-grade invasive ductal carcinoma. The tumor cells were found to be positive for estrogen receptors (ER) in approximately 90% of the cells and progesterone receptors (PR) in approximately 90% of the cells. The human epidermal growth factor receptor 2 (HER2) status was negative (score 1+). The cancer was classified as SBR grade 3/3, with Ki-67 showing positivity in approximately 90% of the tumor cells. Additionally, E-cadherin was found to be positive, while p63 was negative. This type of breast cancer is categorized as luminal B.

Following neoadjuvant chemotherapy, she underwent lumpectomy and found to have negative sentinel lymph nodes (ypT1N0M0). Subsequently, radiotherapy was administered, followed by a 5-year course of hormonal treatment, which was completed approximately 1 year ago.

In addition, she had a recurrence of her left breast cancer with ductal carcinoma in situ in March 2021. Post-mastectomy histology results of left breast, nipple-sparing mastectomy in the same year were as follows: High nuclear grade cribriform and solid ductal carcinoma in situ, pTis pathologic stage (DCIS), no invasive carcinoma was found in the regions investigated, and one lymph node was negative for metastatic carcinoma. Moreover, she had a laparoscopic-assisted vaginal hysterectomy with bilateral salpingo-oophorectomy in 2021 for adenomyosis, with no peritoneal seeding nodules noted at that time. The patient was admitted for upper GI hemorrhage due to esophageal varices, and significant ascites were discovered. The peritoneal wash cytology revealed breast-originating cancer cells after she had peritoneal tapping. The positron emission tomography (PET) scan (Fig. 1) revealed a negligible uptake in peritoneal alterations indicative of peritoneal carcinomatosis. A left adrenal lesion with low uptake had been stable for a long time and was consistent with an adenoma. No other metastases were identified. Prior to discharge, the following laboratory test results are obtained shown in Table 1.

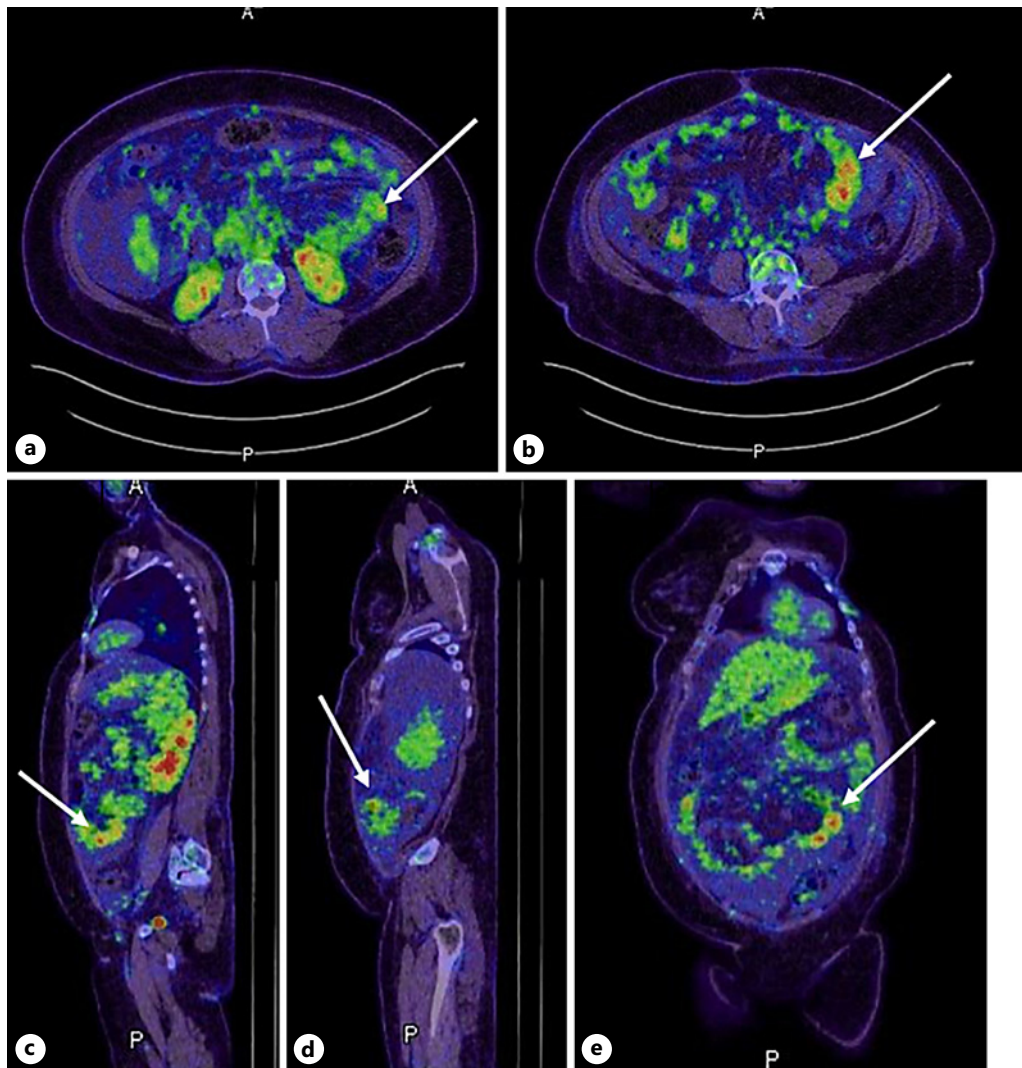


Fig. 1. a–e PET scan images with arrows showing minimal uptake in peritoneal changes that represent peritoneal carcinomatosis.

The patient was put on palbociclib and letrozole, and a PET CT was performed 3 months after establishing the diagnosis, revealing stable omental illness and minor ascites. After observing disease regression and clear ascetic fluid on restaging pictures, the palbociclib treatment was discontinued and letrozole was administered alone. A PET scan was performed 2 months later, and it continues to demonstrate disease control (Fig. 2).

Discussion

The most common causes of ascites in the USA are liver cirrhosis and portal hypertension, which account for 85 percent of cases. Seven percent of patients had ascites caused by cancer. Some patients have cirrhosis in addition to peritoneal carcinomatosis [6]. The sites of breast cancer metastasis differ according to the histological subtype, with papillotubular carcinoma and scirrhous carcinoma being highly metastatic to the

Table 1. Patient's laboratory values compared to normal values

Parameter	Patient's values	Normal values
CEA ^a , µg/L	6.0	3.8–5.0 ^h
CA 19-9 ^b , U/mL	2.0	<27
CA 15-3 ^c , U/mL	28.0	<34.5
Albumin, g/L	28	35–50
Total bilirubin, µmol/L	31	<21
AST ^d , U/L	32	<32
ALT ^e	27 U/L	<33 µmol/L
Leukocyte count × 10 ³ /µL	4.4	4–104
Hemoglobin, g/dL	8.3	12–15
Hematocrit, %	26.3	36–46
Platelets, ×10 ³ /µL	78	150–410
INR ^f	1.6	<4.9
aPTT ^g , s	29.9	25.1–36.5

*Tumor markers.

^aCarcinoembryonic antigen.

^bCarbohydrate antigen 19-9.

^cCancer antigen 15-3.

^dAspartate aminotransferase.

^eAlanine transaminase.

^fInternational normalized ratio.

^gActivated partial thromboplastin time.

^hValues for nonsmokers.

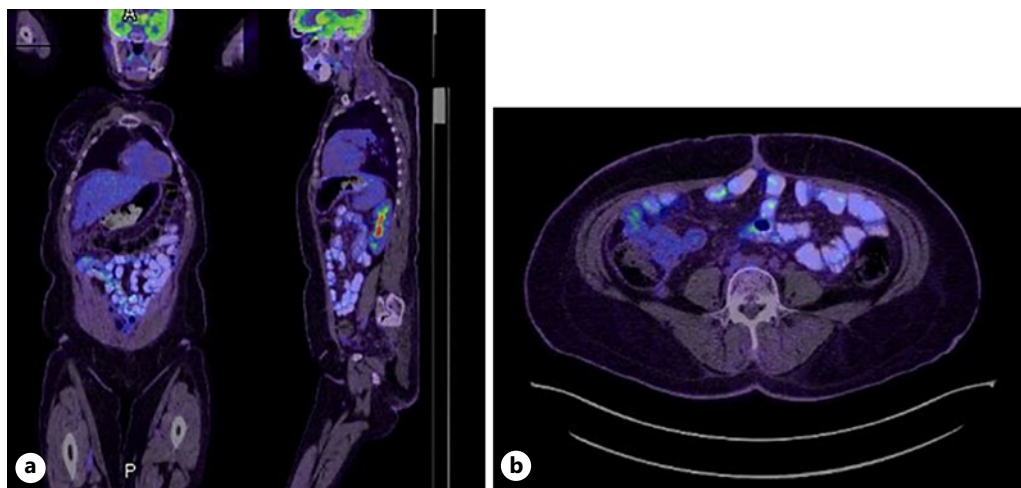


Fig. 2. a, b Repeated PET scan 2 months later that showed regressing peritoneal involvement with minimal activity.

peritoneum and tubular carcinoma being more metastatic to the liver and bone [7]. There is an association between peritoneal carcinomatosis and invasive lobular carcinoma. However, our patient developed it since she has a high-grade invasive ductal carcinoma.

Ovarian and stomach cancers are the leading causes of peritoneal carcinomatosis [8]. This case illustrates the difficulty in diagnosing peritoneal carcinomatosis in breast cancer patients, as the patient came with malignant ascites 8 years after diagnosis and 2 years after completing adjuvant treatment. According to the literature, there is no conventional strategy for managing these cases; therefore, she was treated with systemic palliative therapy. Cytoreduction and hyperthermic intraperitoneal chemotherapy are alternative therapeutic choices with a good overall survival [9, 10]. She was started on palbociclib and letrozole based on the results of the initial breast tissue histopathology, without a repeat biopsy, and had a favorable response around 1 year after beginning treatment.

Considering the stability of her disease and the presence of liver cirrhosis, it was determined that discontinuing palbociclib was the most appropriate course of action. This decision was based on the potential risk of transaminitis and the rare but possible occurrence of fulminant hepatitis that can be associated with the use of this medication [11–13].

Despite peritoneal carcinomatosis being a fatal disease with a high mortality rate and a median overall survival of 14–26 months, we can anticipate a favorable prognosis for our patient based on this knowledge [9]. This condition has a rapid progression and poor prognosis, making early detection and treatment crucial [14].

Our patient has decompensated liver cirrhosis, and her breast cancer was in remission as a result of her completion of adjuvant endocrine therapy, which renders peritoneal metastasis less likely. Diagnosing peritoneal metastases in a patient with cirrhosis of the liver is difficult and can be easily missed, especially if the patient has ascites. As a result, we are reporting this case to shed light on and call attention to similar occurrences so that appropriate investigations can be conducted, and the diagnosis can be confirmed. Lastly, the CARE Checklist has been completed by the authors for this case report, attached as online supplementary material (for all online suppl. material, see <https://doi.org/10.1159/000531835>).

Conclusion

We would like to highlight the importance of good assessment and investigating ascites, especially in breast cancer patients with a history of cirrhosis. Malignant ascites secondary to peritoneal metastasis could be the first presentation of metastatic breast cancer.

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Statement of Ethics

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. Ethics approval was not required for the publication of this case report. This article was approved by Hamad Medical Corporation Medical Research Center, approval number 04-22-178.

Conflict of Interest Statement

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Author Contributions

All authors contributed equally to writing the manuscript's creation. S.M. was involved in conceptualization and writing the original draft. S.M., M.B.H., N.A., B.S., N.S., and A.A. participated in literature review and reviewed the manuscript. A.A. was involved in supervision, writing the review, and editing.

Data Availability Statement

All data generated or analyzed during this study are included in this article and its online supplementary material. Further inquiries can be directed to the corresponding author.

References

- 1 Li CI, Uribe DJ, Daling JR. Clinical characteristics of different histologic types of breast cancer. *Br J Cancer*. 2005 Oct;93(9):1046–52.
- 2 Franceschini G, Manno A, Mulè A, Verbo A, Rizzo G, Sermoneta D, et al. Gastro-intestinal symptoms as clinical manifestation of peritoneal and retroperitoneal spread of an invasive lobular breast cancer: report of a case and review of the literature. *BMC Cancer*. 2006;6(1):193.
- 3 Sheen-Chen S-M, Liu Y-W, Sun C-K, Lin S-E, Eng H-L, Huang W-T, et al. Abdominal carcinomatosis attributed to metastatic breast carcinoma. *Dig Dis Sci*. 2008 Nov;53(11):3043–5.
- 4 Bertozzi S, Londero AP, Cedolini C, Uzzau A, Seriau L, Bernardi S, et al. Prevalence, risk factors, and prognosis of peritoneal metastasis from breast cancer. *Springerplus*. 2015;4:688.
- 5 Flanagan M, Solon J, Chang KH, Deady S, Moran B, Cahill R, et al. Peritoneal metastases from extra-abdominal cancer - a population-based study. *Eur J Surg Oncol*. 2018 Nov;44(11):1811–7.
- 6 Runyon BA, Montano AA, Akriviadis EA, Antillon MR, Irving MA, McHutchison JG. The serum-ascites albumin gradient is superior to the exudate-transudate concept in the differential diagnosis of ascites. *Ann Intern Med*. 1992 Aug;117(3):215–20.
- 7 Fuke A, Tabei I, Okamoto T, Takeyama H. Complete remission from peritoneal metastasis of late recurrent breast cancer by endocrine therapy: a case report. *Surg Case Rep*. 2020;6(1):313.
- 8 Cortés-Guiral D, Hübner M, Alyami M, Bhatt A, Ceelen W, Glehen O, et al. Primary and metastatic peritoneal surface malignancies. *Nat Rev Dis Primers*. 2021;7(1):91.
- 9 McLemore EC, Pockaj BA, Reynolds C, Gray RJ, Hernandez JL, Grant CS, et al. Breast cancer: presentation and intervention in women with gastrointestinal metastasis and carcinomatosis. *Ann Surg Oncol*. 2005 Nov;12(11):886–94.
- 10 Cardi M, Sammartino P, Mingarelli V, Sibio S, Accarpio F, Biacchi D, et al. Cytoreduction and HIPEC in the treatment of “unconventional” secondary peritoneal carcinomatosis. *World J Surg Oncol*. 2015 Oct;13:305.
- 11 Turner NC, Ro J, André F, Loi S, Verma S, Iwata H, et al. Palbociclib in hormone-receptor-positive advanced breast cancer. *N Engl J Med*. 2015;373(3):209–19.
- 12 LiverTox. *Clinical and Research information on drug-induced liver injury* [Internet]. Bethesda (MD): National Institute of Diabetes and Digestive and Kidney Diseases; 2012. Palbociclib. [Updated 2020 May 10]. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK547882/>.
- 13 Hyppolite JJ, Hilzenrat N. Palbociclib-induced severe hepatitis: a case study and literature review. *Can Liver J*. 2021 Nov 11;4(4):433–7.
- 14 Beniey M. Peritoneal metastases from breast cancer: a scoping review. *Cureus*. 2019 Aug;11(8):e5367.