Unexpected B-hCG elevation in metastatic inflammatory breast cancer: a diagnostic dilemma

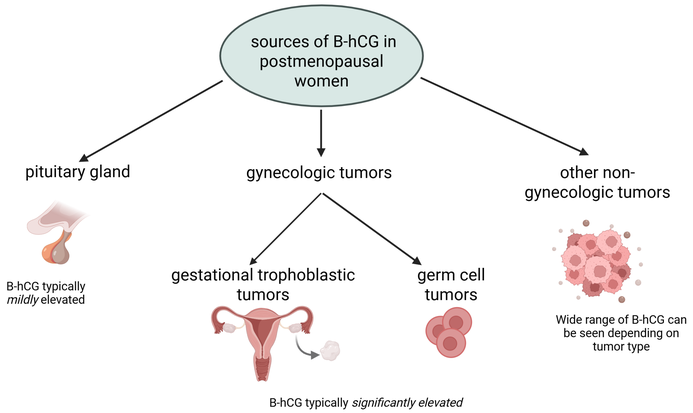
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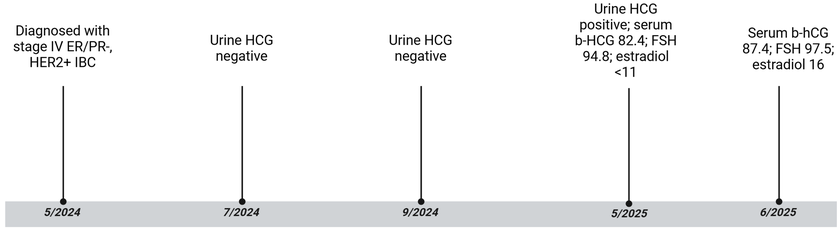
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Background

- The beta subunit of human chorionic gonadotropin (B-hCG) is often used as a marker of pregnancy, but can be produced by several different sources, including the placenta, trophoblastic tumors, nontrophoblastic tumors, and the pituitary gland.
- Some studies have shown that hCG from a placental source appears to be protective against breast cancer, while ectopic production of B-hCG appears to be associated with poor prognosis.
- Currently B-hCG is not used as a routine tumor marker for breast malignancies.
- As part of routine testing during chemotherapy at our institution, all patients undergo a pregnancy test due to the risks of chemotherapy on the developing fetus.
- Here we present a case of an unexpected B-hCG elevation in a patient with metastatic inflammatory breast cancer discovered on routine pregnancy test.





Case Presentation

- A 49 year old female was diagnosed with breast cancer in May 2024 after developing a palpable mass, swelling, and erythema of the left breast. She underwent a left breast biopsy which showed ER/PR-, HER2+ IDC, and left axillary lymph node biopsy showing metastatic carcinoma. PET/CT showed disease to multiple lymph nodes and pulmonary nodules. She was diagnosed with stage IV HER2+ inflammatory breast cancer. At the time of diagnosis, patient was premenopausal.
- Disease progressed through several lines of therapy, including pertuzumab, docetaxel, trastuzumab; dose dense doxorubicin and cyclophosphamide; and trastuzumab deruxtecan. Most recent therapy was tucatinib, capecitabine, and trastuzumab.
- In May 2025, she had routine labs done including a urine pregnancy test which resulted positive. She had two prior urine pregnancy tests which were negative in July and September 2024.
- A follow up serum B-hCG quantitative test in May 2025 showed a B-hCG of 82.4 mIU/mL. Additional labwork which showed an estradiol of <11 pg/mL and FSH of 94.8 IU/L, consistent with a post-menopausal state. Patient had also reported abstinence and amenorrhea for the past year. Gynecology was consulted and it was determined to be a false positive pregnancy test and her therapy was continued.
- Repeat labs in June 2025 showed a serum B-hCG of 87.4 mIU/mL, estradiol of 16 pg/mL, and FSH of 97.5 IU/L, again consistent with a post-menopausal state.

Discussion

- This entity of elevated B-hCG in breast malignancies is not well described. There are select case reports that have described elevated B-hCG in breast malignancies with choriocarcinomatous features and phyllodes tumor.
- Case studies have evaluated the prognostic implication of elevated B-hCG in breast malignancies, however levels in these studies were only very mildly elevated (e.g. <5 mIU/mL).
- While one explanation is that the B-hCG elevation could be due to a pituitary source, typically in these cases the B-hCG is only mildly elevated (e.g. a mean of 9.5 mIU/mL with a range of 2.1-32 mIU/mL in one study). On the other hand, in trophoblastic tumors, B-hCG is typically very significantly elevated, greatly above the level seen in this patient. Case reports have described B-hCG production by a variety of non-gynecologic tumors, with a wide range of degree of B-hCG elevation. This patient's case would be suspicious for paraneoplastic B-hCG production by her breast cancer.
- Future studies are needed to further understand if elevated B-hCG in breast cancer has an impact on prognosis.

References

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