Early detection of disease relapse in patients with operable breast cancer by circulating tumor dna monitoring.

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Abstract

Background & Objectives

A characteristic feature of breast cancer is its propensity for late recurrence. Current follow-up do not include radiological imaging or blood-based monitoring to detect systemic relapse. Hence, we aimed to investigate whether circulating tumor DNA could be used for the early detection of systemic breast cancer relapse after curative treatment.

Methods

This case-control study included 70 patients with operable breast cancer from a larger observational study (PBCB). The cases were 35 patients with systemic relapse over a median follow-up of 8.29 years, while the control group had 35 matched relapse-free patients. Plasma samples from 35 healthy women were also analyzed. Tissue biopsies were collected from primary tumors at diagnosis and metastases at relapse, with blood samples taken every 6-12 months for up to 11 years post-surgery. Tissue samples were analyzed using the Oncomine™ Comprehensive Assay v3C, and blood samples for ctDNA using the Oncomine™ Breast cfDNA Research Assay v2

Results

Nineteen out of 35 patients with relapse were ctDNA positive at systemic disease relapse. ctDNA was detected before clinically or radiologically relapse in 17 of 35 relapsed patients, with a median lead time of 9.9 months (P=0.0002). In 13 of 19 ctDNA-positive relapsed patients, the same mutations were found in both ctDNA and primary tumor tissue; in 7 of these, the ctDNA variant was also detected in the metastasis biopsy.Two patients had ctDNA variants detected in metastasis but not in the primary tumor. Among 35 patients without relapse, 7 were ctDNA positive after surgery, with no plasma-primary tumor variant associations.

Conclusion

Serial postoperative ctDNA assessment enables early detection of systemic disease relapse in patients with operable breast cancer.

Do you have any conflicts of interest?

No, I do not have a conflict of interest.