Ultrasensitive ctDNA-based MRD monitoring predicts relapse in postoperative HR+ IBC

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Background

- Inflammatory breast cancer (IBC) is an aggressive subtype with ↑ recurrence rates and ↓ OS after definitive treatment
- Despite its high-risk biology, there are no separate guidelines for adjuvant treatment
- Our hypothesis: An ultrasensitive minimal residual disease (MRD) assay can stratify these patients to guide clinical decision-making

Patient Population

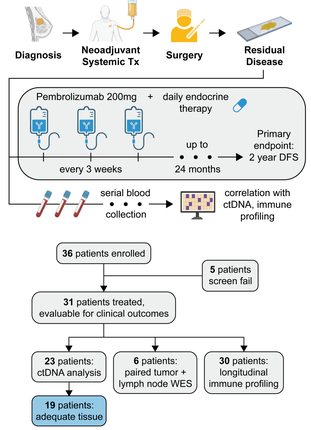


Figure 1. A phase II trial of adjuvant αPD-1 in HR+ IBC (NCT02971748). 19 patients with sufficient material to build tumor-informed panels were included in this analysis.

Ultrasensitive MRD in HR+ IBC

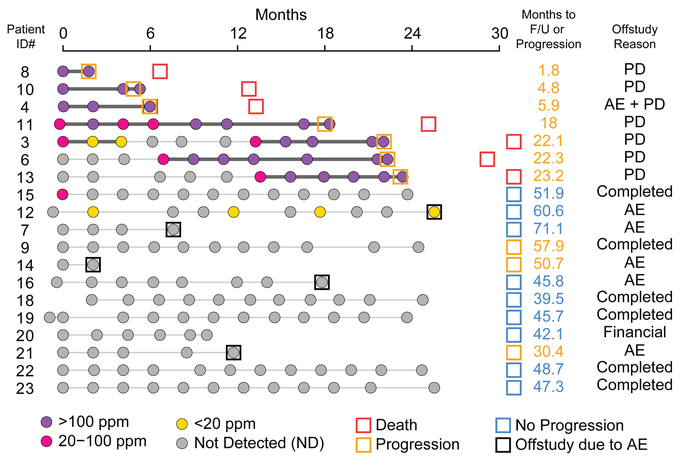


Figure 2. Ultrasensitive MRD assay can detect ctDNA at levels <100 ppm (parts per million) and precedes clinical progression. 153/154 (>99%) total samples passed QC. 14 out of 42 (33%) positive samples were detected at levels <100 ppm. PD: progressive disease, AE: adverse event, F/U: follow-up.

ctDNA Dynamics

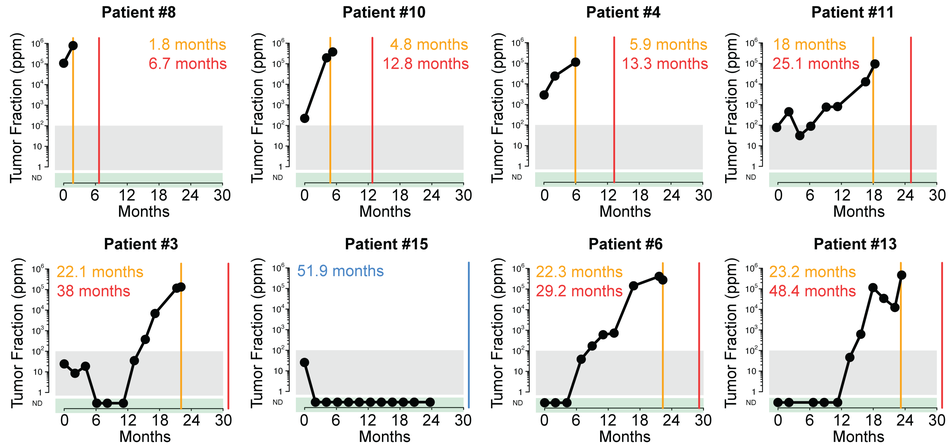


Figure 3. ctDNA kinetics reveal patterns of treatment response with lead time to progression of up to 15 months. Patients #8, #10, #4, and #11 were detectable at the post-operative baseline timepoint and were unresponsive to adjuvant therapy. Patients #3 and #15 achieved seroconversion to undetectable, with #15 maintaining a long-term remission. Patients #6 and #13 reveal a pattern of recurrence despite undetectable baseline. blue = last follow up without progression; orange = radiographic progression; red = death.

Clinical Outcomes

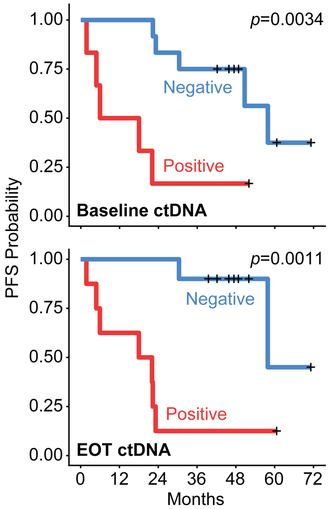


Figure 4. ctDNA detected at baseline or end of treatment (EOT) correlates with shorter progression-free survival (PFS).

Results and Conclusions

- ctDNA detection using an ultrasensitive MRD assay preceded radiographic relapse by up to 15 months.
- ctDNA levels correlated with clinical outcomes. ctDNA negativity at EOT was associated with 100% PFS at 24 months; in contrast, 7 of 8 (88%) ctDNA+ patients progressed within 24 months.
- Personalized ctDNA MRD testing is feasible and highly sensitive in the postoperative HR+ IBC setting.
- These findings support incorporating MRD monitoring in adjuvant trials to guide clinical management in IBC.

Acknowledgments

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