Transcript Details

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Revolutionizing Breast Cancer Care: The Emerging Role of Liquid Biopsy Technologies

Announcer:
You're listening to *Project Oncology* on ReachMD. On this episode, Dr. Heather Parsons will discuss the technological advancements and innovations behind liquid biopsy approaches. Dr. Parsons is a medical oncologist at Dana-Farber Cancer Institute and an Assistant Professor of Medicine at Harvard Medical School. She also presented a session on this topic at the 2024 San Antonio Breast Cancer Symposium. Here's Dr. Parsons now.

Dr. Parsons:
So the way that liquid biopsy technologies compare to traditional methods of disease monitoring in terms of sensitivity, specificity, and clinical utility is that it is still early in terms of understanding all of those relationships. However, it's really exciting that in multiple studies across multiple solid tumors, and in breast cancer specifically, we've seen that liquid biopsies overall and circulating tumor DNA, or ctDNA, in particular have looked as though they will be as good as but most likely better than current approaches to monitoring disease.

In the metastatic setting, when we think about monitoring disease in breast cancer, we usually lean on things like CT scans, CAT scans, and PET scans as well as sometimes we use protein-based biomarkers that are called tumor markers like CEA, CA19-9, or CA15-3, and those historically have been okay metrics to identify and track disease, but they are not nearly sensitive enough. And when we move into the early-stage setting—thinking about either the preoperative setting or neoadjuvant setting as well as in the adjuvant setting—we don't have any technologies that are sufficient to monitor disease, so it's such that we don't use anything or recommend using anything currently aside from regular visits with a clinician, history, physical, and then symptom-targeted imaging based on a patient's presentation. And so the potential for liquid biopsy technologies to really change how we care for patients is vast, but we are still in the early stages of understanding MRD and ctDNA in this space.

Specifically thinking about sensitivity and specificity, it looks as though when we talk about ctDNA to detect MRD, or minimal residual disease, that the sensitivity is better than the current metrics that we have, and the specificity is exceptional. We see specificity right now if we see a positive ctDNA test after a patient has completed all of their curative intent treatments—so if you think of a patient who's been through surgery, radiation, and systemic therapy—and if we detect ctDNA, we see almost a hundred percent correlation between that positive test and likelihood of distant recurrence.

It's important to know that these are all studies in breast cancer that are based on retrospective observational studies, and the studies are typically quite small—although, we're starting to see larger numbers—and so the real gap in the literature right now is that we don't have any clinical utility data in breast cancer regarding ctDNA to detect MRD. There are clinical utility data in other cancer types—colon cancer is probably the best example—but we are still limited by the lack of clinical utility data in breast cancer, and we're looking forward to developing that in studies that are ongoing and planned.

So the main challenges or limitations with current liquid biopsy technologies are really focused on a couple of technical pieces. First is that when we think about ctDNA tests to look for minimal residual disease, the most sensitive approaches right now appear to be tests that are based on what we call a tumor-informed approach. So the way that we do those tests is that we do sequencing of a patient's primary tumor with either whole exome or increasingly whole genome sequencing and then create a patient-specific customized panel of alterations to look for in the blood and in the ctDNA from that patient, and those are very doable. They're very feasible and are being done in clinical situations right now, but you can imagine that obtaining a patient's archival tissue is actually a big step and can be cumbersome and that many patients actually in all different settings may not have sufficient tissue to be able to create an assay to develop one of these tests, so we have worked around it in the field so far, but the hope is that at some point, we may see and be able to

develop tests that can get around this issue of requiring tumor-informed approaches.

Announcer:
That was Dr. Heather Parsons discussing the latest advancements in liquid biopsy, which she spoke about at the 2024 San Antonio Breast Cancer Symposium. To access this and other episodes in our series, visit *Project Oncology* on ReachMD.com, where you can Be Part of the Knowledge. Thanks for listening!