Utility of a targeted NGS oncology assay for circulating tumor DNA in a multi-histology clinical setting

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OVERVIEW

Profiling of circulating tumor DNA (ctDNA) from peripheral blood of cancer patients is an attractive alternative to tissue biopsy to identify actionable mutations and guide treatment decisions.

The Revolution Bioscience ctDNA assay is designed to analyze ctDNA in a multi-histology clinical setting. The assay is based on a targeted next-generation sequencing (NGS) panel, which is designed to detect a broad range of somatic mutations in cancer-related genes.

Methods

Targeted ctDNA was performed at Revolution Bioscience as described in Powser et al. (2019), using an NGS panel targeting actionable mutations and rearrangements found in NSCLC. Peripheral blood was collected in 2x10mL K3EDTA collection tubes and plasma was extracted on-site and shipped to Revolution Bioscience (CA, USA).

Results

Specimens were accessioned into Revolution's custom LIMS system. ctDNA was extracted, amplified, and analyzed using an NGS platform targeting 460 genes. Following hybridization and purification of predesigned primers, the probe was analyzed using a custom-designed, clinically validated gene panel.

The disease progressed at bony sites and paclitaxel was started with a response. After 6 months of treatment, she again presented with an Acetabular fracture which required prolonged inpatient hospitalization and a lumbar spine biopsy was performed due to back pain. She was treated with epidural steroid injections and remained on this treatment for 2 years. The disease progressed and severe pain required additional interventions.

Additionally, single gene NGS confirmed a ROS1-CD74 fusion. When the positive result from ctDNA was communicated to the patient, she was treated with crizotinib and remained on this treatment for 4 months before she progressed with malignant pleural effusion.

Due to disease exacerbation, the patient was treated with cabozantinib (American Cancer Society, 2018).

Methods

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