



Western Surgical Association 2020 Annual Meeting

Monday, November 9, 2020
4:00pm – 6:15pm Pacific Time
– Virtual Meeting –

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13. PRELIMINARY ANALYSIS OF LIQUID BIOPSY AFTER HEPATECTOMY FOR COLORECTAL LIVER METASTASES

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Background: Liquid biopsy represents a non-invasive modality for analyzing tumor biology in patients with circulating tumor cells. Its use in patients with colorectal liver metastases (CLM) is relatively new, and its potential diagnostic, surveillance, and therapeutic applications are not yet well-defined. We sought to describe the genetic information gained from liquid biopsy, examine the correlation of positive liquid biopsy with CT imaging and CEA, and study the impact on overall survival (OS) after CLM resection.

Methods: This is a retrospective cohort study of patients at a single institution with CLM from 2016-2018. All patients underwent CLM resection and had plasma drawn postoperatively for liquid biopsy analysis, in addition to associated surveillance imaging and CEA. A next-generation sequencing-based analysis was performed on plasma to detect somatic mutations in 70 genes. Standard descriptive statistics were used to describe the cohort. Chi-square was used to compare categorical variables. Patients were stratified by number of mutations on liquid biopsy. Overall survival (OS) was estimated using the Kaplan-Meier method.

Results: A total of 55 patients (58.2% male) underwent liver resection and had at least one liquid biopsy with genetic analysis. Of the 55 first liquid biopsies, 16 patients (29.1%) had no mutations, 9 (16.4%) had 1 mutation, 14 (25.5%) had 2-3 mutations, and 16 (29.1%) had ≥ 4 mutations. The most frequent mutations among positive biopsies were APC (88%), TP53 (82%), and KRAS (45%). A total of 80 liquid biopsies with matched serum CEA and CT scan results were available for analysis, as 12 of the 55 patients underwent serial liquid biopsies. Disease progression was identified on 63 CT scans, which correlated with positive liquid biopsy and CEA >3 ng/ml in 84% and 65% of samples, respectively (both $P < 0.001$). Among the 12 patients who had a second liquid biopsy, 5 (41.7%) showed a change in mutational status over time. Unadjusted OS at two years was significantly worse in patients with positive liquid biopsy (71% vs. 100% with negative biopsy, log-rank $p=0.005$). When further stratified, two-year OS was significantly worse with ≥ 4 mutations (47%, log-rank $p < 0.001$).

Conclusion: Liquid biopsy provides additional genetic mutational information in patients with CLM. Positive liquid biopsy is associated with worse survival, especially when multiple genes are mutated. Liquid biopsy may be used in addition to standard imaging and CEA as a non-invasive modality to augment surveillance in patients with CLM and may be useful for informing prognosis and potentially directing future therapies.