AB071. Perioperative liquid biopsy can help risk stratify breast cancer patients

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Background: Analysis of liquid biopsy as cell free DNA (cfDNA) and circulating tumour DNA (ctDNA) has emerged as a promising non-invasive technique to detect fragmented tumour DNA in circulation. Liquid biopsy has shown excellent diagnostic and prognostic potential in breast cancer. Thus, we wished to evaluate the peri-operative dynamics of cfDNA and ctDNA to establish their prognostic ability in breast cancer.

Methods: Breast cancer patients undergoing curative surgery were included. Blood samples were taken pre-operatively and 30 days post-operatively. cfDNA was extracted and measured using spectrophotometry. DNA integrity (long/short DNA fragments) was measured using ALU 247 and ALU115 primers. PIK3CA mutation (exon 9 and 20) detection in ctDNA was performed using high resolution melting (HRM) real-time PCR combined with parallel internal controls.

Results: A total of 29 patients were studied, 14 disease free group (DF) and 15 disease recurrence group (DR). The median patient follow-up was 36 months. cfDNA concentrations and DNA integrity were significantly higher in the DR group compared to the DF group pre-operatively (concentrations; P=0.0004, integrity; P=0.039) and at the 30 day post-operative time period (concentrations; P=0.04, integrity; P=0.03). Higher post-operative cfDNA concentrations was predictive of poor disease free survival (HR: 3.8, P=0.02). Post-operative detection of PIK3CA mutation in ctDNA was associated with a higher risk of recurrence (odds ratio: 1.86, 95% CI: 0.36–12.9).

Conclusions: Perioperative cfDNA and ctDNA evaluation can provide valuable prognostic information and has the potential to stratify risk of recurrence even further and allow a more personalised follow up plan in breast cancer patients.

Keywords: Liquid biopsy; cell free DNA (cfDNA); circulating tumour DNA (ctDNA); breast cancer; peri-operative period; recurrence

doi: 10.21037/map.2020.AB071

Cite this abstract as: Hassan F, O'Leary DP, Wang JH, Redmond P, Ita M, Corrigan M. Perioperative liquid biopsy can help risk stratify breast cancer patients. Mesentery Peritoneum 2020;4:AB071.