The fluid landscape of liquid biopsy

Analysis of circulating tumour DNA (ctDNA), the so-called liquid biopsy, is fast, non-invasive and easy to arrange. So where is this technology best deployed?

At diagnosis, liquid biopsy is limited by a lack of sensitivity. 20-30% of patients have very little ctDNA and mutations can be missed[1,2]. Liquid biopsy is useful where tissue cannot be obtained but results could change management, for example unwell patients with suspected lung cancer. However, a negative result should be treated with caution and tissue biopsy also considered.

Liquid biopsy can be useful following progression on targeted (e.g. EGFR, PARP) or hormone-blocking therapies where specific genomic variants confer resistance. As resistance mutations can arise anywhere within the tumour or metastases, liquid biopsy may offer a better chance at detection. Results can be useful in guiding subsequent lines of therapy.

A potentially practice-changing use of liquid biopsy is the detection of residual disease following surgery, including early stage breast, lung and colorectal cancer[3-5]. Here, the persistence of ctDNA is strongly associated with disease progression. ctDNA is also showing utility for early cancer detection, with combined analysis of mutations and methylation patterns showing promise[6,7]. Clinical trials are underway to investigate both these applications.

[1]Clin Cancer Res. 2019 Nov 15;25(22):6644-6652.
[2]Nat Med. 2018 Sep;24(9):1441-1448.
[3]Nat Cancer. 2020 Jan;1(1):176-183.
[4]JAMA Oncol. 2019 Aug 1;5(10):1473-8.
[5]JAMA Oncol. 2019 Oct 17;5(12):1710-1717
[6]AACR 2020 abstract CT021
[7]Nat Med. 2020 Jul;26(7):1041-1043.

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