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Liquid biopsies offer hope for earlier treatment, better tracking of ovarian cancer

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Credit: Mayo Clinic

Researchers at the Mayo Clinic Center for Individualized Medicine have found a promising new way to monitor and treat recurrence of ovarian cancer—a hard-to-detect disease that claims many lives. New research from George Vasmatzis, Ph.D., of the Department of Laboratory Medicine and Pathology at Mayo Clinic, finds liquid biopsies from blood tests and DNA sequencing can detect a return of ovarian cancer

long before a tumor reappears. That could lead to earlier intervention and more effective, individualized treatment. Dr. Vasmatzis' research on the "Quantification of Somatic Chromosomal Rearrangements in Circulating Cell-free DNA From Ovarian Cancers" is published in the July 20 edition of *Scientific Reports*.

"With liquid biopsies, we don't have to wait for tumor growth to get a DNA sample," says Dr. Vasmatzis. "This important discovery makes it possible for us detect recurrence of the disease earlier than other diagnostic methods. We can repeat liquid biopsies to monitor the progression of the cancer. That gives hope of a better treatment plan over time."

The study was done on 10 patients in advanced stages of ovarian cancer. Blood was drawn before and after surgery. Investigators compared DNA from the liquid blood biopsies to DNA tissue samples from the tumor, using mate-pair sequencing—an inexpensive whole exome sequencing that can reveal genetic changes that contribute to tumor growth.

"In this study, the blood drawn before and after surgery and the surgical tissue was used to identify DNA fragments with abnormal junctions that can only be seen in this patient's tumor DNA," explains Dr. Vasmatzis. "Next-generation mate-pair sequencing was used to identify specific DNA changes of the tumor to create an individualized monitoring panel for liquid biopsy. This allows us to shape treatment to the individual patient rather than using a standard treatment that may not work for everyone."

When post-surgery DNA matched that of the tumor, patients were later found to have had a recurrence of ovarian cancer. However, when the post-surgery DNA did not match the DNA of the tumor, patients were found to be in remission.

Ovarian cancer has one of the highest death rates of all gynecological cancers, because the tumor often cannot be detected until the late stages. Most patients go into remission after initial treatment, but the tumor returns 75 percent of the time. The next stage of ovarian cancer that develops typically does not respond to chemotherapy. More than 21,000 women in the U.S. were diagnosed with ovarian cancer, and 14,000 women died of the disease in 2015.

Provided by Mayo Clinic

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