
Noninvasive Imaging Detects Genetic Mutations In Lung Cancer



A recent study has found that patients with lung cancer could benefit from a high-tech, noninvasive imaging analysis called quantitative computed tomography based texture analysis (QTA). The new method was shown to be a safe alternative to surgical biopsy, which can be dangerous for lung cancer patients. QTA has the ability to non-invasively detect genetic mutations and accurately indicate when tumours might become cancerous.

Lung Cancer and QTA

Researchers at the Translational Genomics (TGen) Research Institute, Scottsdale Healthcare's Virginia G. Piper Cancer Center, and Cancer Treatment Centers of America (CTCA) reviewed 48 patients with non-small cell lung cancer (NSCLC). NSCLC accounts for over 85 percent of all lung cancers and is a leading cause of cancer-related deaths in the United States. The five-year survival rate for patients with NSCLC is less than 10 percent, and 159,000 Americans die of the disease each year.

Scientists are increasingly confident that genetic mutations are responsible for some types of cancer development. Biopsy has been the standard method for obtaining proof of such mutations, but invasive surgery involving the lungs is risky. The investigation found that scanning tumour cells using QTA could successfully determine whether a patient's tumour had the K-ras gene mutation, which causes cancer. QTA was effective with nearly a 90 percent rate of accuracy.

Treatment Precision

Not only does QTA accurately determine the presence of cancerous mutations in tumours, but it allows doctors to track treatment progress for more precise therapies. The possibility to make genomic characterisations without biological sample analysis would help physicians to plan treatment based on each patient's unique profile.

"QTA applied to molecularly defined NSCLC cases may have a broader application to precision medicine by offering a noninvasive way to identifying the best therapies for each patient," said Dr. Glen Weiss, the lead author of the study and CTCA's Director of Clinical Research. He is also a medical oncologist at the centre, and Clinical Associate Professor at TGen's Cancer and Cell Biology Division.

Dr. Ronald Korn, the study's senior author, noted that the use of noninvasive imaging technology to characterise tumours and track treatment lets doctors know within days or weeks whether therapies are working for a patient. As Medical Director of both the Virginia G. Piper Cancer Center and image interpretation lab Imaging Endpoints Core Lab, Dr. Korn and his team have established a rapid detection and assessment of response (RADAR) program. Their hope is that the most recent findings will influence routine medical practice.

The report appears in the journal PLOS ONE.

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