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Lung tumor test is big step

UNC team's work may improve care

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Physicians at UNC-Chapel Hill have helped develop a genetic test that could one day provide lung cancer patients and their doctors with specific information about lung tumors, including whether the tumors will respond to certain treatments.

A similar test is already used to provide more precise diagnoses and treatments to patients with breast cancer. But the science, while likely still a few years away from routine use in lung cancer patients, represents a significant step forward in lung cancer research.

Lung cancer is the deadliest of all cancers, with a five-year survival rate of just 15 percent, yet techniques for diagnosing and determining the severity of the disease have not advanced significantly for decades. Diagnoses are based on a crude analysis of cells under a microscope, which determines whether a patient has non-small-cell disease -- a catch-all term that applies to about 80 percent of all lung cancers -- or the rarer small-cell lung cancer.

Doctors have long observed that certain patients respond to treatment while others do not, and that some lung cancers progress rapidly while others plug slowly along. However, they don't know why and can't predict those outcomes.

Dr. David Neil Hayes, a UNC-Chapel Hill oncologist, was the lead investigator on the team that developed the lung tumor test and is lead author of a paper that reports the team's results in the Nov. 1 issue of the Journal of Clinical Oncology.

The findings suggest a way to provide the data patients and doctors need to make educated decisions about how, or even whether, to treat lung cancer.

Hayes and colleagues at Harvard, Johns Hopkins and elsewhere used their testing process to look at the genetic makeup of 230 tumor samples banked at academic medical centers. Researchers successfully identified three distinct types of lung cancer tumors.

All three newly identified tumor types look identical under a microscope, Hayes said. But each has a genetic "fingerprint" that investigators showed they could reliably identify at multiple research sites using their method.

That's significant because no other research group looking into genetic testing for lung cancer has developed a process that can repeatedly and reliably detect specific tumor types.

"They have done something no one has done before," said Dr. David Harpole, a cardiothoracic surgeon at Duke University Medical Center and director of Duke's lung cancer research center. "There is potential here to do something that could really impact patient care."

Hayes noted that the testing process needs refinement and validation in multiple patient trials before it can be adapted as a routine diagnostic test. He said researchers hope soon to begin patient trials using the process.

After identifying the tumor types, the team reviewed medical records of patients whose tumor samples were analyzed, to determine how the disease progressed.

One tumor variety, which the researchers dubbed "squamoid" type, was found to be associated with the vast majority of cases where cancers spread to patients' brains. Another type, which they called the "bronchoid" tumor, was linked to recurrences in patients' bones. Bronchoid tumors also contained a large number of genes known to be associated with resistance to cisplatin, a drug often used to treat lung cancer.

David Work of Chapel Hill said that kind of specific information would have been helpful to him six years ago, when his wife, Rebecca, was diagnosed with advanced lung cancer. Work said both he and Rebecca, a nonsmoker who died in August, were dismayed at the lack of good information about lung cancer and how it can progress.

Having data like that produced by the UNC-led team "would have been much more comforting and much more reassuring that you are on the right track," Work said.

Rebecca Work had surgery in 2000 to remove the upper lobe of her left lung, immediately followed by chemotherapy and radiation. But the cancer spread to her lymph nodes, liver and bones. She had radiation therapy this spring, which alleviated her bone pain. But she declined further chemotherapy, David Work said, which she feared would ultimately fail while leaving her weak and exhausted in her final days.

"It was her decision just to have some peace and quiet," he said.

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5 DEADLIEST CANCERS

Top five cancer killers in the United States, by sex, 2003:

MenDeaths per year

1. Lung90,330

2. Colon27,870

3. Prostate27,350

4. Pancreatic16,090

5. Leukemia12,470

WomenDeaths per year

1. Lung72,130

2. Breast40,970

3. Colon27,300

4. Pancreatic16,210

5. Ovarian15,310

AMERICAN CANCER SOCIETY; NATIONAL CENTER FOR HEALTH STATISTICS

* MOST RECENT YEAR FOR WHICH DATA ARE AVAILABLE

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