Early Lung Cancer Detection: Approaching the 'Tipping Point'?  

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On October 20, 2006, the International-Early Lung Cancer Action Program (I-ELCAP), an international consortium of leading early lung cancer detection researchers and allied health-care providers including radiologists, thoracic surgeons, pulmonologists, oncologists, statisticians, research nurses, and computer scientists met at Cornell University Medical Center for their 15th International Conference. The meeting occurred as the New England Journal of Medicine was publishing I-ELCAP's landmark experience in using spiral computed tomography (CT) in over 31,000 individuals at risk for lung cancers from 38 institutions across three continents (NEJM 355:1763-1771, 2006).

Spurred by the knowledge of lethality of lung cancer with best standard approaches, these professionals, led by Prof. Claudia Henschke and a team from Cornell, have worked over the past 15 years to improve the detection of localized potentially curable lung cancer. In a series of peer-reviewed publications in leading specialty journals, the investigators have reported the results of their work to the medical and scientific community. As a result, new forms of early lung cancer have been described. New and more efficient approaches have been defined to screen for lung cancer. This involves the innovative use of spiral CT, image-processing techniques, and Internet-based clinical trial coordination, as well as successful integration with tobacco-cessation measures.

Even in high-risk populations for screening, the frequency of detected lung cancers is only about 1 in 100 cases (NEJM 352:2714-2720, 2005). Economical approaches to confirm the occurrence in this setting have been developed that entail minimal use of surgical techniques for early lung cancer diagnosis. The overwhelming majority of people going to surgery in the I-ELCAP program are found to have lung cancers. A panel including many of the most respected thoracic pathologists in the world has reviewed these cases and reported that the cases found by CT screening fulfill standard criteria for full-fledged aggressive lung cancers (Am J Surg Pathol 30:606-613, 2006). This supports recent tumor biology information suggesting that these screen-detected tumors behave like routinely detected lung cancers (Clin Cancer Res 10:5973-5974, 2004). Fortunately, 85% of the cases are found in stage I, where the chance for cure is the greatest. The estimated 10-year survival is approximately 90% for the more than 400 patients in the study with clinical stage I lung cancer. This reflects both the utility of the detection protocol to minimize side effects and the fact that the preponderance of cancers were found while still curable. Published analyses of this approach have demonstrated that this favorable result can be achieved at a cost that is lower than most other vital federally supported medical services.

As related in the NEJM report, this result of CT screening could translate to a profound reduction in lung cancer mortality. Lung cancer is the world’s leading cause of cancer death, killing over 160,000 people every year in the United States alone. The I-ELCAP investigators have developed a detailed protocol that outlines the best approach to each of the many critical steps in achieving these excellent results.

A remarkable aspect of this study is that it was largely conducted by "sweat equity." While other groups such as the National Cancer Institute, American Cancer Society, and other organizations have funded portions of this research, the vast majority of the I-ELCAP research was conducted by the voluntary efforts of the investigators. This involved hundreds of professionals in the execution of this study along with the tens of thousands of study participants from across the world whose voluntary efforts were united only by a fervent desire to finally demonstrate that we can routinely cure even the world's most feared cancer. These I-ELCAP results convincingly demonstrate that systematic efforts to find early lung cancer can lead to favorable results, as has been already been shown for
cervical, breast, and colon cancer. At the I-ELCAP conference, there was an important and challenging discussion of where to go next. This involved leaders from the American Cancer Society, National Cancer Institute, Agency for Healthcare Research and Quality, American Association for Cancer Research, American Legacy Foundation, Lung Cancer Alliance, and the Cancer Research and Prevention Foundation, among others. While there were many perspectives, it is clear that the I-ELCAP report precipitated a multitiered dialogue regarding the challenges and opportunities in lung cancer screening. I-ELCAP investigators reaffirmed their commitment to working together with all relevant parties to bring CT-based early lung cancer management to the public in a safe, economical, and effective fashion. It is a critical public health discussion that is long overdue.

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