Lung Cancer Screening

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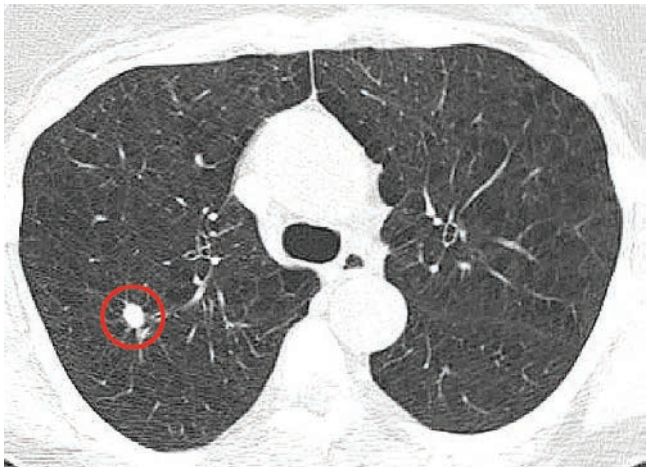
The Deadliest of Cancers

Lung cancer is the leading cause of cancer-related deaths worldwide. In 2012 it is estimated that more than 160,000 Americans died of lung cancer, representing about 28% of all cancer deaths.1 Lung cancer kills more people than the next four leading causes of cancer-related deaths combined (i.e., colon, breast, pancreas and prostate).1 Lung cancer also is the second most commonly diagnosed cancer in men and women, with an estimated 226,000 new cases in 2012.1

Cigarette smoking is by far the major cause of lung cancer, causing approximately 80-90% of cases.2 The relative risk of death from lung cancer in current smokers, compared to never smokers, is 24.97 in men and 25.66 in women. These relative risks have risen since 1960 more than two-fold for men and nearly 10-fold for women.3 In non-smokers, passive exposure to smoking may cause up to 25% of lung cancer.

Finding the Best Screening Test

There are more than 94 million current and former smokers in the United States.2 Current standard treatments for lung cancer are ineffective, with only 16% of patients alive 5 years after diagnosis. Surgery seldom offers a long-term cure, because we do not detect cancer early enough. Until recently, there was no effective method for lung cancer screening. Chest X-ray has been shown ineffective in lung cancer screening. Low-dose computed tomography (CT), however, recently was proven to be effective in the National Lung Screening Trial (NLST).4 This study, published in the New England Journal of Medicine, consisted of three annual screenings, comparing screening with low-dose computed tomography (CT) to screening with a single view chest X-ray. More than 53,000 current or former heavy smokers, ages 55 to 74, enrolled in study centers across the country. The compliance rate with screening was better than 90%. After an average follow-up of 6.5 years, researchers found 20% fewer lung cancer deaths among trial participants screened with CT compared to X-ray. CT screening detected more than twice as many lung cancers as did chest X-ray screening. In the low-dose CT screened group, 62 lung cancer-related deaths per 100,000 people per year were prevented.



Screening Guidelines Introduced

Since the initial results of NLST were reported, the American College of Chest Physicians (ACCP) and American Society of Clinical Oncology (ASCO) jointly have published evidence-based practice guidelines about who is eligible for lung cancer screening and how and where it should be performed.5 In 2013 the U.S. Preventive Services Task Force issued a recommendation for lung cancer screening among those facing the highest risks. The Task Force recommended that annual screening with low-dose chest CT be offered to individuals between 55-80 years old (with history of 30 pack years), and former smokers, between 55-80 years old who quit smoking (with history of 30 pack years) within the past 15 years.6 Eligible screenees should be counseled with a complete description of benefits and harms, so that each individual can make an informed decision. Annual screening with low-dose CT was not recommended for:

- individuals under age 55 or over 80 years
- individuals who have smoked fewer than 30 pack years
- individuals who quit smoking more than 15 years ago, or
- individuals with severe health concerns that would limit potentially curative treatment and/or life expectancy

Weighing the Benefits and Harms

When considering eligibility, benefits, limitations, and potential risks associated with CT lung cancer screening, individuals are highly encouraged to ask their providers for guidance. Providers may refer patients and their families to a Shared Decision-Making Center, where counselors have tools to aid informed and personalized decisions. The major benefit of screening is a reduction in risk of dying from lung cancer. The most common harm is a false positive finding. Although the false positivity rate was 27% at the baseline screening in NLST, this could be lowered to 13% using the recently developed reporting system, LungRADS.7 A false-positive test may require further testing and, in some cases, an invasive procedure, like removing a sample of lung tissue. Less than one in 1,000 patients with a false positive test has a major complication from further testing or procedures. Some deaths from complications of follow-up testing have been reported, but this occurrence is rare, most often occurring in patients who do have lung cancer. Another potential harm is overdiagnosis, or the finding of a lung cancer that otherwise would not have become symptomatic. With regard to the radiation delivered by low-dose CT screening, the estimated harm is much smaller than the estimated benefit in those who meet the criteria for screening. The limitations of low-dose CT screening are that it will not find all lung cancers, cancers may not be found early, and not all patients who have a lung cancer diagnosed by low-dose CT will avoid death from lung cancer.

Addressing Tobacco Dependence

Screening is not an alternative to smoking cessation. All current smokers should be counseled on the benefits of smoking cessation. Research suggests that the absolute risks of continuing to smoke are large, and the absolute benefits of cessation also are large. Current smokers interested in CT screening for lung cancer are encouraged strongly to seek smoking cessation counseling. Screening centers can provide patients and families with support and tools to successfully quit smoking, including referral to tobacco cessation clinics or national quitlines of anyone over the age of 18 who wants to end their dependence on tobacco.

References:

1 Siegel, R., Naishadham, D. and Jemal, A. Cancer statistics, 2012. CA Cancer J Clin, 2012. 62(1): p. 10-29.

2 Cigarette smoking among adults and trends in smoking cessation - United States, 2008. MMWR Morb Mortal Wkly Rep, 2009. 58(44): p. 1227-32.

3 Thun, M.J., et al. 50-Year Trends in Smoking-Related Mortality in the United States. N Engl J Med 2013; 368:351-364

4 Aberle, D.R., et al., Reduced lung-cancer mortality with low-dose computed tomographic screening. N Engl J Med, 2011. 365(5): p. 395-409.

5 Bach, P.B., et al., Benefits and harms of CT screening for lung cancer: a systematic review. JAMA, 2012. 307(22): p. 2418-29.

6 http://www.uspreventiveservicestaskforce.org/uspstf/uspslung.htm

7 http://journals.lww.com/thoracicimaging/Fulltext/2014/09000/ACR_STR_Practice_Parameter_for_the_Performance_and.12.aspx

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