Commentary: It is not as bad as they say: The risks of surgery in screening-detected lung cancer are overstated

Michael K. Hsin, MD, and James C. Ho, MD

From the Department of Cardiothoracic Surgery, Queen Mary Hospital, Hong Kong, China; and Department of Medicine, Hong Kong University, Hong Kong, China.

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Address for reprints: Michael K. Hsin, MD, Department of Cardiothoracic Surgery, Queen Mary Hospital, 102 Pok Fu Lam Rd, High West, Hong Kong, China (E-mail: mkhsin@hotmail.com).

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Central Message

Analysis of the National Lung Screening Trial surgical cohort should dispel the misconception surrounding the overstated risks of surgery for screening-detected lung cancer.

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The goal of a cancer screening program is to target an at-risk population of individuals without any symptoms and thus to detect cancer at an early stage, when timely treatment may be beneficial. The National Lung Screening Trial (NLST) showed a 20% reduction of lung cancer mortality, and a 6.7% reduction in all-cause mortality, when using low-dose CT (LDCT) rather than chest x-ray screening.¹ Between 2010 and 2015, however, only 3.9% of eligible patients were screened for lung cancer in the United States.² Reasons put forward to explain this low uptake of LDCT screening include the following:

1. Several European studies (Danish Lung Cancer Screening Trial, Multi-centric Italian Lung Detection Trial, Detection and Screening of Early Lung Cancer with Novel Imaging Technology and Molecular Assays) failed to demonstrate lung cancer mortality benefit with screening.³⁻⁵
2. Cost-effectiveness of LDCT screening may not be acceptable in many countries.
3. There are concerns regarding the risks associated with LDCT screening. These include radiation, false positives, overtreatment, and, importantly, the morbidity of surgical procedures as a result of screening detected abnormalities, which in the NLST was reported to be 32%.¹

The study in this issue of the *Journal* by Kemal and colleagues,⁶ which focuses on the surgical patients in the NLST cohort, should allay some of the concerns regarding the risks of surgery in patients with screening-detected lung cancer. The NLST did not have a predefined management protocol for screening-detected abnormalities, and, not surprisingly given the era of the study, Kemal and colleagues,⁶ found low use of preoperative positron-emission tomography and nonsurgical biopsy. Lobectomy or pneumonectomy was performed in 83.98% of the cases, and 16.1% of the patients had sublobar resection. Video-assisted thoracoscopic surgery was the surgical approach in 29.6% of the cases. With respect to complications after surgery for lung

cancer, 15.5% were classified as major, of which the most common category was prolonged air leak or bronchial stump leak (6.5% of the cohort and 42% of the “major complications”). The NLST data set did not differentiate between these types of leak; however, it is highly probable that bronchial stump leak was uncommon. For the remaining major complications, respiratory failure occurred in 3.7%, major adverse cardiovascular events in 0.8%, and cerebrovascular accident in 1%. Overall 30-day mortality was reassuringly low at 1.7%. On multivariate analysis, the use of sublobar resection was significantly associated with decreased complications, and the use of video-assisted thoracoscopic surgery approached significance.

As far as the conflicting data on mortality benefits of lung cancer screening are concerned, the recently presented findings of the Netherlands Levens Longkanker Screenings Onderzoek (NELSON), a Dutch-Belgian randomized, controlled trial, reconfirmed the benefits of computed tomographic screening.⁷ Relative to a control population, men at high risk of lung cancer had a 26% reduction in lung cancer-related death at 10 years; in women, the reduction was between 39% and 61% at different years of follow-up. Important differences between NELSON and NLST include the use of computed tomographic volumetry and a protocolized algorithm for the management of screening-detected nodules.

The study of Kemal and colleagues⁶ should dispel some of the misguided concerns regarding the risks of surgery

associated with screening. Post hoc analysis of NLST data suggests decreased complications with the use of sublobar resection and video-assisted thoracoscopic surgery. Standardized computed tomographic volumetry—with or without artificial intelligence technology, protocolized management algorithm of lung nodules, and state-of-the-art surgical techniques—should be incorporated in future designs of LDCT lung screening programs.

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