

Editor's note:

In the era of personalized medicine, a critical appraisal new developments and controversies are essential in order to derived tailored approaches. In addition to its educative aspect, we expect these discussions to help younger researchers to refine their own research strategies.

Controversies on Lung Cancer: Pros and Cons

Pros: long-term CT scan follow-up should be the standard of care in patients who are curatively treated for an early-stage non-small cell lung cancer

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There is absolutely no doubt that long-term follow-up with computed tomography (CT) should be the standard of care for survivors of early-stage non-small cell lung cancer (NSCLC). In the following argument, I will present the logical reasoning, overwhelming evidence and solid consensus guidelines that mandate CT surveillance as the highest standard of care that we can offer to our patients.

The risk of survivors

Survivors of early-stage NSCLC are among the highest-risk patients for developing another lung cancer; either a new metachronous primary tumor (1-2% per-year risk) or recurrent disease (10-38% overall risk) (1). It has been consistently demonstrated that, although the risk of recurrent lung cancer decreases with time, the risk of a new metachronous primary cancer continues to increase to as high as 6% person-years (2). When compared to the high-risk population of smokers in the National Lung Cancer Screening Trial (NLST), who had a cumulative lung cancer risk of 0.6% person-years, survivors of NSCLC have 10 times that risk (3). Based on this fact alone, it is logical to extrapolate that survivors of lung cancer will derive a much higher benefit from CT surveillance than the 20% relative reduction in mortality that was reported in the NLST (3).

Overwhelming evidence for early detection and survival

The high-quality evidence supporting CT surveillance after curative treatment for NSCLC is very hard to refute. A recent study evaluating low dose CT surveillance after NSCLC resection found that 8.1% of patients will be diagnosed with a second lung cancer at a median follow-up of 4.3 years. In 87% of those patients, CT was able to detect the cancer at Stage I, and those patients were offered a second round of curative treatment with an overall 5-year survival of 69% (4). Another prospective study, comparing surveillance with minimal dose CT to surveillance with chest X-ray after curative resection of early-stage NSCLC, demonstrated that CT is more sensitive (94% vs. 21%; $P < 0.0001$) and has a higher negative predictive value (99% vs. 96%; $P = 0.007$) than chest X-ray for the diagnosis of new or recurrent cancer (5). In that study, the prevalence of new or recurrent disease was 23.2%, and the majority of patients (78%) had asymptomatic Stage I cancer that was only detected on CT. These patients were treated for a second round with curative intent and had a median survival of 69 months. A multitude of other series in NSCLC survivors have consistently reproduced this data, confirming the excellent sensitivity of CT in the early

detection of asymptomatic new NSCLC, the potential for offering curative treatment for a second time, and the positive effect on prolonged survival (6-8). A recent meta-analysis of pooled data from 1,669 patients who underwent resection of NSCLC has demonstrated that CT surveillance is associated with a statistically significant improvement in survival when disease is detected at the asymptomatic stage (9).

Adherence to guidelines

Clinicians who treat NSCLC in an evidence-based manner are guided by a combination of clinical judgment, multidisciplinary tumor board discussions, and recommendations from practice guidelines. Agencies advocating for surveillance after resection of early-stage NSCLC include the National Cancer Centre Network (NCCN) (10), American Association for Thoracic Surgery (AATS) (11), American College of Radiology (ACR) (12), American College of Chest Physicians (6), American Society of Clinical Oncology (13), and the European Society of Medical Oncology (14). Although these recommendations differ on the imaging modalities and intervals for surveillance, the most widely followed guidelines of the NCCN, AATS, and ACR mandate for the use of CT in surveillance. Intensive surveillance with CT every 6 months is recommended for the first 2-4 years after resection of early-stage NSCLC, when the chance of cancer recurrence is highest. Beyond 5 years after treatment, most guidelines recommend yearly low dose CT screening to detect new metachronous primary lung cancer.

Summary

There should be no doubt in anybody's mind that CT surveillance is the standard of care for patients who are curatively treated for early-stage NSCLC. These are the patients at highest risk for developing another lung cancer in the future, and there is high-quality evidence and unequivocal guidelines to support their surveillance.

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Footnote

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declare.

References

1. Hanna WC, Keshavjee S. How to follow up patients after curative resection of lung cancer. *Semin Thorac Cardiovasc Surg* 2013;25:213-7.
2. Lou F, Huang J, Sima CS, et al. Patterns of recurrence and second primary lung cancer in early-stage lung cancer survivors followed with routine computed tomography surveillance. *J Thorac Cardiovasc Surg* 2013;145:75-81; discussion 81-2.
3. National Lung Screening Trial Research Team, Aberle DR, Adams AM, et al. Reduced lung-cancer mortality with low-dose computed tomographic screening. *N Engl J Med* 2011;365:395-409.
4. Ripley RT, McMillan RR, Sima CS, et al. Second primary lung cancers: smokers versus nonsmokers after resection of stage I lung adenocarcinoma. *Ann Thorac Surg* 2014;98:968-74.
5. Hanna WC, Paul NS, Darling GE, et al. Minimal-dose computed tomography is superior to chest x-ray for the follow-up and treatment of patients with resected lung cancer. *J Thorac Cardiovasc Surg* 2014;147:30-3.
6. Rubins J, Unger M, Colice GL, et al. Follow-up and surveillance of the lung cancer patient following curative intent therapy: ACCP evidence-based clinical practice guideline (2nd edition). *Chest* 2007;132:355S-67S.
7. Korst RJ, Kansler AL, Port JL, et al. Accuracy of surveillance computed tomography in detecting recurrent or new primary lung cancer in patients with completely resected lung cancer. *Ann Thorac Surg* 2006;82:1009-15; discussion 1015.
8. Mollberg NM, Ferguson MK. Postoperative surveillance for non-small cell lung cancer resected with curative intent: developing a patient-centered approach. *Ann Thorac Surg* 2013;95:1112-21.
9. Calman L, Beaver K, Hind D, et al. Survival benefits from follow-up of patients with lung cancer: a systematic review and meta-analysis. *J Thorac Oncol* 2011;6:1993-2004.
10. National Comprehensive Cancer Network. NCCN Clinical practice guidelines in oncology (NCCN Guidelines®): non-small cell lung cancer, version 2.2013. Available online: <http://www.respiratory-thessaly.gr/assets/nscl%202013.pdf>, accessed on Jul 16, 2014.
11. Jaklitsch MT, Jacobson FL, Austin JH, et al. The American Association for Thoracic Surgery guidelines for lung cancer screening using low-dose computed tomography

- scans for lung cancer survivors and other high-risk groups. *J Thorac Cardiovasc Surg* 2012;144:33-8.
12. Sause WT, Byhardt RW, Curran WJ Jr, et al. Follow-up of non-small cell lung cancer. American College of Radiology. ACR Appropriateness Criteria. *Radiology*. 2000;215 Suppl:1363-72.
 13. Pfister DG, Johnson DH, Azzoli CG, et al. American Society of Clinical Oncology treatment of unresectable

- non-small-cell lung cancer guideline: update 2003. *J Clin Oncol* 2004;22:330-53.
14. Crinò L, Weder W, van Meerbeeck J, et al. Early stage and locally advanced (non-metastatic) non-small-cell lung cancer: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. *Ann Oncol* 2010;21 Suppl 5:v103-15.

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