



Post-treatment lung cancer patients: residual tumor, recurrence, and second primary tumor

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In an article published in the current issue of the *Jornal Brasileiro de Pneumologia*, the usefulness of routine CT follow-up for lung cancer recurrence and second primary lung cancer is questioned.⁽¹⁾ This question is relevant, particularly in the field of cancer imaging.

In recent years, there have been several reports of increased survival in patients with lung cancer. This is due to improved treatment options to control lung cancer and lung cancer recurrence, including surgery, radiation therapy, and systemic therapies, as well as new experimental modalities.⁽²⁾

Although the likelihood of local and distant recurrence decreases with time, the risk of second primary cancers does not, the reported incidence of second primary cancers being 8.6% in a study by Rice et al.⁽³⁾ and 7.3% in a study by Fink-Neuboeck et al.⁽⁴⁾ It has also been reported that, regardless of stage and histological type, lung cancer patients are more likely to have distant metastases than local recurrence, being candidates for additional treatment.⁽⁵⁾

A considerable number of patients with stage I-III lung cancer will have local recurrence (22-50%) or distant recurrence (3-20%) after treatment with curative intent.⁽⁶⁾ Because of the high risk of non-small cell lung cancer recurrence and second primary lung cancer, the National Comprehensive Cancer Network and the American Association for Thoracic Surgery recommend patient monitoring.⁽⁷⁾ The American Society of Clinical Oncology recommends that patients undergo follow-up chest CT for recurrence every six months for two years and then annually for detection of new primary lung cancers.⁽⁸⁾ Radiologists and nuclear medicine physicians should be able to distinguish between treatment-related findings and cancer-related findings. In comparison with CT, 18F-FDG PET/CT is associated with higher rates of detection of postsurgical recurrence, being recommended by the National Comprehensive Cancer Network to differentiate tumor recurrence from benign conditions such as atelectasis, consolidations, and radiation-induced

fibrosis; however, it should be borne in mind that 18F-FDG uptake can be seen up to three months after tumor removal and up to six months after radiation therapy, particularly stereotactic body radiation therapy, and is not always indicative of tumor recurrence.⁽⁷⁾

According to the Union for International Cancer Control, an incomplete resection is defined by the presence of tumor in the primary site, lymph nodes, or distant sites after treatment.^(9,10) This plays a major role in determining a prognosis and indicating the need for additional treatment. Because it is difficult to distinguish between recurrent and residual tumor after an apparently complete resection, surgeons have attempted to refine these definitions. In 1998, the Spanish Society of Pulmonology and Thoracic Surgery proposed the following definition of complete resection: (a) resection margins microscopically free of tumor; (b) complete mediastinal lymphadenectomy; (c) absence of extracapsular lymph node extension; and (d) the most distant lymph node stations (the highest in the superior paratracheal node and the lowest in the pulmonary ligament) must be disease free.⁽⁹⁾ Therefore, the completeness of resection is classified as R0 (no residual tumor), R1 (microscopic residual tumor), or R2 (macroscopic residual tumor). The International Association for the Study of Lung Cancer has also proposed a definition for uncertain resection, referred to as R(un).⁽¹¹⁾ An R(un) is defined by examination of fewer than three N1 lymph nodes and three N2 lymph nodes; failure to perform lobe-specific systematic nodal dissection; the highest mediastinal lymph node removed being positive; carcinoma in situ at the bronchial margin; and positive pleural lavage cytology.⁽¹¹⁾

According to Morellato et al.,⁽¹⁾ there is controversy in the literature regarding the types of tests that lung cancer patients should undergo, how often they should undergo such tests, and how long. In addition, it is not always easy to determine whether a cancer patient has a residual tumor, recurrence, or second primary tumor. Therefore, a multidisciplinary approach to diagnosis, treatment, and follow-up can minimize these uncertainties.

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