Lung Cancer Pathology Blueprint for Future Work

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Despite great research advances, lung cancer remains the most common major cancer worldwide in terms of both incidence and mortality. In addition there has been little change in the mortality over the past several decades with 5-year survival remaining between 10-15%.

Nevertheless, progress in understanding of lung cancer pathology has led to deeper insights into clinically and biologically relevant diagnostic criteria and classification. The major areas where additional work needs to be focused include: 1) adenocarcinoma, 2) neuroendocrine lung tumors, and 3) multiple lung tumors (synchronous, metachronous and metastatic).

ADENOCARCINOMA

Since the paper by Noguchi and Shimosato in 1995 which showed that patients with small peripheral adenocarcinomas with a pure bronchioloalveolar carcinoma (BAC) had a 100% five-year survival, the field of lung adenocarcinoma pathology has been transformed. A series of key papers from Japan by Suzuki, Yokose, Sakurai and Terasaki have provided innovative insights into how to identify favorable prognostic subsets of small peripheral adenocarcinomas. Work by the IASLC/ASCO pathology/radiology panel suggests that semiquantitative assessment of 2004 WHO adenocarcinoma subtypes within tumors may have clinical and biologic relevance. Hopefully practical ways can be developed for defining a "minimally invasive" favorable prognostic subset of lung adenocarcinoma in addition to those tumors with a pure BAC growth pattern.

Atypical adenomatous hyperplasia has also been recognized as a preinvasive lesion for lung adenocarcinoma. This has opened an entirely new and exciting area of research in the carcinogenesis of lung adenocarcinoma.

NEUROENDOCRINE LUNG TUMORS

Over the past 15 years we have learned to separate the major categories of typical carcinoid, atypical carcinoid, large cell neuroendocrine carcinoma and small cell carcinoma. Nevertheless, neuroendocrine lung tumors continue to present challenges particularly in how to treat patients with atypical carcinoid and large cell neuroendocrine carcinoma. A proposal is being made to develop an international registry of pulmonary neuroendocrine tumors to address this question and to further refine diagnostic criteria.

MULTIPLE LUNG TUMORS (SYNCHRONOUS, METACHRONOUS, METASTASIS)

One of the greatest challenges in lung cancer diagnosis is the vexing problem of sorting out whether patients with more than one lung cancer nodule in the lung have synchronous primaries or intrapulmonary metastases. This has great implications for staging and determining patient management. Similarly the question of metachronous primaries versus recurrence or metastasis from the previous primary also is problematic. The question of metastatic carcinoma versus a primary lung carcinoma (particularly with head and neck vs lung squamous cell carcinoma) is often also difficult to address by morphology alone. The current morphologic criteria for each of these scenarios need to be supplemented by molecular tools to address these questions.

SUMMARY

This is a very exciting time to be working in the field of lung cancer pathology. In recent years clinically and biologically significant pathologic subsets of lung cancers have been identified, but further work bound a close collaboration between pathologists, molecular biologists, radiologists, surgeons and oncologists will be necessary to further advance this field.

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