Small Cell Lung Cancer* 
Case Report

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The selection of appropriate chemotherapeutic and/or radiation therapy for small cell lung cancer should be done after careful diagnosis and staging workup. A patient with small cell lung cancer is presented and explanation given for each step in diagnosis and staging.

(CHEST 1995; 107:241S-242S)

Small cell lung cancer (SCLC) accounts for only 15 to 20% of all lung cancer cases. However, the unique sensitivity of this cell type to chemotherapy and radiation therapy has led to the classification of the five or more cell types of lung cancer into the two categories of SCLC and non-small cell lung cancer (NSCLC). NSCLC tends to extend, metastasize, and recur locally, and is therefore generally classified at presentation into operable, potentially operable, and inoperable disease stages. In contrast, SCLC is best considered a systemic disease. At presentation, SCLC has already spread beyond the confines of a single hemithorax in two thirds of patients. Therefore, once the diagnosis of SCLC has been established, a staging workup is undertaken to ascertain whether limited or extensive disease is present, enabling the selection of the appropriate chemotherapeutic and/or radiation therapy regimen.

Clinical Case Report

A 55-year-old man presented to his internist with a nonproductive cough of 4 weeks' duration. He had smoked two packs of cigarettes a day for 30 years. He had no exertional dyspnea, chest pain, or other respiratory symptoms. Previously, he had experienced neither chronic cough nor phlegm production. Review of symptoms did not disclose any neurologic complaints, constitutional symptoms such as weight loss, anorexia, fevers, or night sweats, and he had no musculoskeletal complaints. Medical history was notable only for essential hypertension treated with atenolol, 50 mg daily, with no history of tuberculosis or tuberculosis exposure, asthma, pneumonia, or other illness.

The physical examination was notable for a well-nourished man with a respiratory rate of 18, midline trachea, absence of cervical or supraclavicular lymphadenopathy, and dullness to percussion with decreased breath sounds in the right upper chest. Abdominal examination showed no hepatosplenomegaly or masses by palpation, and a normal liver span by percussion. Neurologic examination showed no focal deficits.

The chest radiograph disclosed a markedly enlarged right hilum and right paratracheal region consistent with adenopathy and partial atelectasis of the right upper lobe. Serum electrolytes were within normal limits, as were serum calcium, phosphate, albumin, alanine aminotransferase (ALT), serum aspartate aminotransferase (AST), alkaline phosphatase, and bilirubin values. The serum lactate dehydrogenase (LDH) level was 301 IU (normal range, 107 to 291 IU).

Diagnostic Approach

The optimal approach to treating this patient should entail establishing the most definitive diagnosis required for therapy, while entailing the least risk. The radiographic pattern of a central mass in a heavy smoker strongly suggests either squamous cell carcinoma of the lung or SCLC. The combination of a central mass, atelectasis, and substantial adenopathy is suggestive of SCLC, which tends to arise and spread along the submucosa, and causes bulky adenopathy. Nevertheless, empiric treatment for SCLC based on the patient's clinical and radiographic presentation would not be warranted, given the variability in presentation of so many thoracic neoplasms and nonneoplastic disorders such as TB.

Expectorated sputum could be obtained noninvasively for cytologic examination. Sputum induction to obtain a specimen from a patient without a productive cough might be considered, as it also would not require an invasive procedure. However, studies of the diagnostic yield of sputum cytologic examination in the diagnosis of lung cancer indicate that lung cancer is diagnosed in less than 40% of cases. More importantly, the rates of misclassification of SCLC as NSCLC and vice versa are too high to allow accurate classification and thus the proper selection of therapy. Percutaneous fine-needle aspiration and/or biopsy of tissue for cytologic and pathologic examination might also be considered. However, the yield for such a transthoracic approach is lowest when the lesion is centrally, rather than peripherally, located, as in this case. The low expected yield of this procedure must also be weighed against the high risk of pneumothorax (25 to 30%).

A surgical procedure such as mediastinoscopy or thoracotomy would almost certainly confirm the presence and type of bronchogenic carcinoma in this patient. It might be argued that because NSCLC is statistically the most likely diagnosis, thoracotomy and lobectomy would afford both diagnosis and treatment. However, if this mass were indeed NSCLC, clinical staging would place it at stage IIIA,

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and abdominal CT scan, cranial CT scan, radionuclide bone scan, and bone marrow aspiration and biopsy specimens (Table 2).

However, a recent study from the National Cancer Institute analyzing the utility of this staging workup found that the data from the initial evaluation (prior to screening scans and bone marrow examinations) would have detected almost two thirds of cases of extensive disease in their large series. The authors suggest that a sequential approach to staging spares many patients with extensive disease the unnecessary tests performed in a “full” staging workup, and would be substantially more cost-effective.1

In the present case, the patient’s evaluation included bone scan and abdominal CT scan, which were normal. Cranial CT scan revealed a single asymptomatic right frontal lesion consistent with a metastasis, and the patient was therefore classified as having extensive disease. He was referred for entry into a research protocol involving both combination chemotherapy and radiotherapy; as part of that protocol, he underwent bilateral bone marrow biopsies, results of which showed no metastatic disease.

### Table 1—SCLC: Sites of Metastatic Spread*

<table>
<thead>
<tr>
<th>Site</th>
<th>% Cases</th>
</tr>
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<tbody>
<tr>
<td>Bone</td>
<td>35</td>
</tr>
<tr>
<td>Liver</td>
<td>25</td>
</tr>
<tr>
<td>Bone marrow</td>
<td>20</td>
</tr>
<tr>
<td>Brain</td>
<td>10</td>
</tr>
<tr>
<td>Extrathoracic lymph nodes</td>
<td>5</td>
</tr>
<tr>
<td>Subcutaneous masses</td>
<td>5</td>
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</tbody>
</table>

*Adapted from Johnson.5

where consideration of a multimodality approach would be more appropriate than surgical resection alone. If, as the scenario suggests, the patient has SCLC, then lobectomy might confirm the diagnosis, but without any potential therapeutic benefit as the treatment is usually nonsurgical.

Fiberoptic bronchoscopy would provide the highest possible diagnostic yield for both SCLC and NSCLC. Because the chest radiograph indicates the presence of an obstructing endobronchial lesion, the expected yield of an endobronchial examination with washings and brushings obtained for cytologic studies and endobronchial biopsy specimens for histopathologic examination would be very high, with low concomitant morbidity (cough during the procedure, minor risk of bleeding, or pneumothorax). In the event of NSCLC, bronchoscopy allows preoperative endobronchial staging of the extent of tumor in the tracheobronchial tree to help determine whether the lesion spares the tracheal carina and at least 2 cm of the mainstem bronchus, and is therefore still resectable. Commonly, lung cancer is but one of several possibilities on the list of differential diagnoses. Fiberoptic bronchoscopy would also expedite verification of TB, sarcoidosis, and other nonneoplastic disorders, as well as the exclusion of a synchronous primary.

In this case, fiberoptic bronchoscopy revealed an obstructing lesion in the anterior segment of the right upper lobe. Endobronchial biopsy specimens and bronchial washings were diagnostic of SCLC.

### Staging Workup

To allow tailored treatment, SCLC must be classified as either limited disease, generally defined as disease confined to a single hemithorax, mediastinum, and/or ipsilateral supraclavicular lymph nodes, or extensive disease, having spread beyond those regions and no longer able to be encompassed within a single radiotherapy portal.5 The most common sites of metastatic spread for SCLC are outlined in Table 1. To detect these local and distant sites of spread, the staging workup might logically include the patient’s medical history and results of physical examination, complete blood cell count, serum chemistry studies and liver function tests (ALT, AST, alkaline phosphatase, bilirubin, and LDH), chest radiograph, chest and abdominal CT scans, cranial CT scan, radionuclide bone scan, and bone marrow aspiration and biopsy specimens (Table 2).


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### References


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