case of TSS, even though the patient did not live long enough to exhibit all of the clinical criteria, (namely desqua-
mation). The criteria for TSS diagnosis include the following:
temperature >38.9°C; diffuse macular erythroderma; hy-
potension (systolic blood pressure <90 mm Hg); desqua-
mation of the palms and soles 2 to 3 weeks after the onset
of illness; and evidence of multisystem organ failure of at
least 3 organ systems. This patient had evidence of renal,
respiratory, and hematologic failure. In addition, the patient
must have negative blood, throat, or cerebrospinal fluid
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in the left upper lobe on preoperative chest radiograph (Fig 1). Computed tomography (CT) confirmed this finding (Fig 2). The patient was asymptomatic, but had a 75 pack-year smoking history.

Transbronchial biopsy via fiberoptic bronchoscopy (FOB) obtained cells consistent with BAC. One week following bronchoscopy, the patient experienced an isolated episode of hemoptysis. This was accompanied by wheezing that improved when she used a previously prescribed bronchodilator. Three weeks after bronchoscopy, the preoperative chest radiograph (CXR) (Fig 3) again demonstrated the left upper lobe mass, but now there was new left lower lobe atelectasis.

At surgery, repeated FOB prior to intubation demonstrated mature blood clots in the left main, left upper, and left lower lobe bronchi. These fragments were extracted by suctioning during the course of the upper lobectomy.

The preoperative diagnosis of BAC was confirmed on pathologic sections, and bronchial and vascular margins were clear. The pleura was not involved, and all 21 sampled lymph nodes were negative for tumor. Postoperative CXRs demonstrated reexpansion of the left lower lobe. The patient had an uneventful postoperative course.

A follow-up CT scan (Fig 4) obtained seven months after surgery revealed multiple small ill-defined nodules, located anteriorly in the lower left lobe. The distribution of the nodules directly corresponded to the location of the blood clots seen preoperatively, and were in direct relationship to small bronchi. No lesions were present elsewhere in the chest and there was no adenopathy.

A CT-guided fine-needle aspiration biopsy of the lesions was positive for malignant cells consistent with BAC. A left lower lobectomy was performed.

**DISCUSSION**

Diffuse, infiltrating BAC was characterized in 1903 by Musser only following earlier descriptions by Malassez. Only in 1953 was the solitary nodular form of this entity recognized as a different manifestation of the same disease. In 1960, Liebow defined BAC as well-differentiated adenocarcinomas arising in the peripheral lung "beyond a grossly recognizable bronchus" with local spread through the airspaces; the lung stroma is used as a framework, but direct invasion or destruction of pulmonary tissue is a late mani-

**CASE REPORT**

A 50-year-old woman was admitted to the hospital for a dilatation and curettage for menometrorrhagia. A 4 × 3-cm mass was present in the left upper lobe on preoperative chest radiograph (Fig 1). Computed tomography (CT) confirmed this finding (Fig 2). The patient was asymptomatic, but had a 75 pack-year smoking history.

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Bronchioloalveolar cell carcinoma constitutes between 1 and 9 percent of primary pulmonary malignant neoplasms. Unlike other primary lung cancers, BAC occurs as frequently in men as in women, and it has the weakest association with smoking, occupational exposure, or chronic lung disease. The average age at diagnosis is similar to that of adenocarcinoma of the lung, but patients are less likely to complain of constitutional symptoms (such as weight loss, fevers, and malaise) than with other lung tumors.

Its myriad manifestations—solitary pulmonary nodule, lobar consolidation, multiple nodules, diffuse infiltrate—continue to intrigue clinicians, radiologists, and pathologists. The solitary and diffuse forms certainly display dichotomous prognoses; recent studies have shown stage I BAC to have a prognosis more favorable than that of stage I adenocarcinoma (with five-year survival of 75 percent and 50 percent, respectively), whereas the survival times of stage II and III BAC are significantly shorter than that for stage III adenocarcinoma.

When it was realized that BAC demonstrated both solitary and diffuse forms, the natural assumption was that the former was the predecessor of the latter, and that earlier detection of BAC would assure a better prognosis. Thus, speculation as to whether solitary foci of BAC have the capability to spread and implant throughout the bronchial tree, thus giving rise to diffuse involvement, has been a source of discussion for decades but has never led to clear demonstration of such a case. Late development of local and distant metastases due to hematogenous and lymphogenous spread in patients who have undergone resection of a solitary BAC has been clearly documented similar to the typical metastatic spread of adenocarcinoma; but multiple studies following patients over various numbers of years have failed to identify any such patients with focal disease who have progressed to diffuse involvement by BAC in a manner suggesting rapid endobronchial spread.

The alternative hypothesis, advanced most notably by Miller et al., is that solitary and diffuse BAC may (or may not) share a common histology, but are in reality different clinical entities and should be treated as such, has therefore received favorable support. A review by Hill in 1984 directly contradicted this theory by asserting that in the absence of "surgical intervention, there was a transition from a solitary lesion to diffuse disease in every patient." Tracking of 45 patients in their study demonstrated "progression" in these patients from a nodule to a mass, to diffuse nodules, and to localized and diffuse consolidations. Other patients reportedly demonstrated progression from masses to consolidations and to diffuse nodules. The lack of convincing radiographic documentation in the review article hindered resolution of the debate, and there has been a significant lack of corroboration of Hill's stance in the literature in the years since his report appeared. The current case offers rather convincing evidence of endobronchial spread of BAC from a solitary focus, resulting in diffuse pulmonary involvement. Although the blood aspirated from the left lower lobe bronchus postoperatively was not sent for cytologic study, the short time span between the initial procedure and BAC recurrence in the lower lobe, its radiologic and pathologic appearance, and postoperative stage I of the patient, make endobronchial spread of BAC the most likely explanation.

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Needle/Wire Lung Nodule Localization for Thoroscopic Resection

Philip A. Templeton, M.D., F.C.C.P., and Mark Krama, M.D.

Small lung nodules undiagnosed by percutaneous needle biopsy have traditionally gone to thoracotomy for diagnosis. We describe a technique using computed tomographic needle/wire lung localization of these nodules, to be resected using video-assisted thoracoscopy. This is less invasive and less painful than thoracotomy and provides for cost-effective definitive diagnosis.

(Chest 1993; 104:953-54)

Thoracoscopy is a surgical technique enabling lung resection without thoracotomy and its associated complications. The lung is collapsed and three small incisions are made in the chest for insertion of a video thoracoscope, biopsy forceps, and a stapling and/or laser device. Peripheral lesions visible on the surface of the lung can be resected under direct vision. A wedge biopsy specimen 3×3 cm is obtained, and successive applications can be performed to obtain a specimen 9×9 cm. To allow resection of lesions deep to the surface of the lung, we report a system for needle/wire lung localization.

CASE REPORT

A 57-year-old man with a history of resected bladder carcinoma and an 80 pack-year smoking history had a small left upper lobe

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