development techniques and applications for monoclonal antibodies (MoAbs) in the diagnosis, therapy, and study of lung cancer. They also described some of the limitations encountered in the in vitro use of radiolabeled MoAbs.

We agree with them that the successful clinical application of radiolabeled MoAbs requires the selective localization of the radiolabeled antibody at the tumor site and the achievement of a high tumor-to-background ratio. Unfortunately, tumor accretion of radiolabeled MoAbs is usually low, which appears to be a considerable limitation to the clinical use of radiolabeled MoAbs. Furthermore, when given intravenously, radiolabeled MoAbs produce some undesirable activity in certain organs, such as the liver, spleen, and bone marrow. This nonspecific uptake can be critical in therapeutic trials with radiolabeled MoAbs.

In a recent study we tried to overcome these limitations using endobronchial administration of radiolabeled MoAbs in patients with non-small-cell lung cancer. We tested the feasibility of endobronchial direct delivery of radiolabeled MoAbs and the biodistribution of the radiotracer $^{181}$I-B72.3, a pancarcinoma MoAb that reacts with adenocarcinoma and adenosquamous lung cancer cells was placed on the tumor protruding into the bronchial lumen under visual monitoring, using a catheter during fiberoptic bronchoscopy. A nonspecific anti-hepatitis B virus antibody was used as the negative control.

We demonstrated that radiolabeled MoAbs can be administered through a bronchoscope without side effects or adverse reactions. Furthermore, analysis of serial imaging data showed that radiolabeled MoAb was specifically retained at the tumor site for up to six days. No other organ was visualized with the exception of faint activity in the gastrointestinal tract, bladder, and thyroid gland (Fig 1). The activity removed from the bronchi by ciliary action was in fact swallowed, digested, and partially absorbed. The ciliary epithelium of the bronchi, however, proved to be an effective barrier to molecules with a high molecular weight, such as MoAb molecules.

In conclusion, we have found that endobronchial administration of radiolabeled MoAbs is a feasible technique and leads to very efficient targeting of lung tumors. It would be of interest to know whether the authors consider this approach suitable for therapeutic trials with radiolabeled MoAbs.

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To the Editor:

We appreciate the comments of Sofia and colleagues, and generally concur with their view that locoregional application of antibodies may provide advantages in tumor targeting and accretion. Indeed, intraperitoneal, intrapleural, and intrathoracic administrations of radiolabeled antibodies have been reported.14 With regard to endobronchial administration for radioimmunotherapy of cancer, this is in principle feasible. However, caution in the use of deep-penetrating beta-emitters should be exercised, since these may be toxic to adjacent normal tissues, particularly the lung. It will also be important to select an antibody that has a high discrimination between neoplastic and normal lung, and in this regard the B72.3 antibody may not be the best choice.

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FIGURE 1. Anterior views of whole body scans performed 2 h (left) and 6 days (right) after endobronchial deposition of radioactive monoclonal antibody (MoAb) in two patients with non-small-cell lung cancer. Top left, Early scan after deposition of specific MoAb $^{181}$I-B72.3 shows retention of radioactivity at tumor site. Top right, Later scan in the same patient shows retention of radioactivity at the tumor site and the presence of thyroid activity. Bottom left, Early scan after deposition of nonspecific (control) MoAb $^{181}$I-4CA in another patient shows large amount of radioactivity in the left main bronchus, trachea, and gastrointestinal tract. Bottom right, Later scan shows that the nonspecific antibody is not retained at the tumor site, and activity is present only in the thyroid gland. (Reprinted with permission from reference 2.)
We are confused by the statement that radiolabeled monoclonal antibodies "produce some undesirable activity in certain organs, such as the liver, spleen, and bone marrow." It is more probably the nature of the isotope, not the antibody, that results in this radioactivity. The bone marrow is the critical dose-limiting organ in radioimmunotherapy, and this is likely due more to red marrow targeting of blood-borne radioactivity than to nontoxic antibody accretion. Excessive liver and spleen radioactivity usually is seen when indium-111 labels are used.4

In summary, although locoregional administration of monoclonal antibodies is another intriguing possibility for cancer radioimmunotherapy, there is still a great dependence on the choice of antibody, antibody form, radionuclide, and dosage schedule.5

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Thromboembolism Associated with Acquired Immunodeficiency Syndrome

To the Editor:

Noninfectious thromboembolic disease is infrequently considered in the differential diagnosis of acquired immunodeficiency syndrome (AIDS)-related pleuropulmonary complications. Circulating antiphospholipid antibodies, though commonly detectable, are usually not associated with thrombotic complications in patients with human immunodeficiency virus (HIV) disease.1 Stimulated by the report of a case of unexplained pulmonary embolism,2 which appeared in the September 1991 issue of Chest, we describe a second case, in which the perceived rarity of this condition in AIDS led to a delay in diagnosis.

A 37-year-old Haitian man presented with a three-day history of dyspnea, right-sided pleurisy, fever (maximum, 39.5°C), and scant hemoptysis. He had advanced HIV disease (CD4+ lymphocytes, 6/cu mm; prior cerebral toxoplasmosis) but had recently been stable and ambulatory on a regimen of zidovudine. A chest roentgenogram showed a moderate right pleural effusion, consolidation of the underlying lung, and a small left effusion. The right-sided exudate contained 17,500 erythrocytes and 8,500 leukocytes (88 percent polymorphs) per cubic millimeter. Penicillin and cefotaxime were administered for suspected bacterial pneumonia. Cultures of blood, sputum, and pleural fluid were unrevealing.

The patient's symptoms and fever diminished over several days, but on day 10 he developed acute left pleurisy, tachycardia (120 beats per minute), and tachypnea (30 breaths per minute), followed by recrudescence of fever (38.9°C) and recurrence of the left-sided effusion. Uncontrolled infection remained the focus of diagnostic thinking for another week, until radionuclide scans showed multiple, bilateral segmental perfusion defects in regions with normal ventilation, indicating a high probability of pulmonary embolism. Venous Doppler examination and computed tomography of the abdomen revealed no source of emboli. Routine coagulation studies on admission were normal, as were protein C, protein S, and antithrombin III levels. Circulating lupus anticoagulant was not detected. The patient recovered with anticoagulant therapy alone.

We believe that pulmonary emboli accounted for this patient's entire presentation, although an initial right-sided bacterial pneumonia cannot be excluded. No antecedent risk factor for venous thrombosis was identified. The predisposing role of HIV disease itself, if any, remains speculative. This and other recent cases3 emphasize the need to consider thromboembolism in AIDS patients, despite their young age and the usually infectious nature of pleuropulmonary disease with fever in this setting.

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Pulmonary Intubation with Nasogastric Tubes

To the Editor:

I read with interest the "Roentgenogram of the Month" feature1 in the November 1991 issue of Chest, in which pulmonary intubation with nasogastric tubes was discussed. This excellent discussion does not, however, address methods to prevent this common complication.

Roubenoff and Ravich2 describe a two-step method of feeding tube insertion, whereby the tube is first advanced to a point estimated to be at the ziphoid process and its position is then confirmed by an anteroposterior chest roentgenogram, which should show no lateral deviation from the midline, as occurs with bronchial intubation. The tube is then advanced into the stomach, and the position is confirmed with an abdominal x-ray film.

At the University of New Mexico Hospital Intensive Care Unit, we encountered eight episodes of pulmonary intubation in 170 instances of attempted nasogastric feeding tube placement (4.7 percent incidence) over a two-year period. We have modified our method of nasogastric feeding tube placement by rotating the patient's head to either shoulder. This simple maneuver causes deviation of the feeding tube tip from the midline laryngeal opening; this can be verified by visualization of the pharynx. With reeducation of physicians and nursing staff in the passage of fine-bore feeding tubes and meticulous documentation by a single abdominal x-ray film of appropriate tube location, this problem has not recurred.