Methodology in Transbronchial Lung Biopsy

To the Editor:

We feel compelled to comment on Zavala's1 article entitled "Pulmonary Hemorrhage in Fiberoptic Transbronchial Biopsy." While we share his concern over the problem of hemorrhage following transbronchial lung biopsy, our beliefs regarding methodology differ significantly.

There should be no question that the patient's safety is of paramount importance. On the other hand, methods required to ensure safety are, and should be, open to critical appraisal. It is with Zavala's rigid methodology that we disagree. His comments regarding methods were stated very dogmatically, but we know of no evidence that his method is safer than others used around the country.

At our institution, transbronchial lung biopsies are performed transnasally without premedication unless specifically indicated. Our current experience includes 175 patients who underwent two to four biopsies each. Some of these cases have previously been reported.1-5 While significant bleeding has occurred in several patients, only one patient has required intubation for respiratory support, and she had significant respiratory insufficiency prior to the procedure. There have been no deaths associated with the procedure. In our hands, it appears that the use of an endotracheal tube for all patients undergoing transbronchial biopsy is unnecessary; however, the use of such a tube in selected individuals, particularly those with respiratory insufficiency or bleeding tendencies (or both), may be indicated.

Our experience also differs from Zavala's1 in the routine use of fiberoscopy. Physical limitations at our institution make the routine use of fluoroscopic techniques difficult; thus, most of our procedures are done without fluoroscopic guidance unless the patient has localized disease (less than lobar). Our complications include only two pneumothoraces in the 175 patients, which we believe is an acceptable rate.

While the patient's safety and comfort should remain the first priority in the performance of any procedure, our experience with transbronchial lung biopsy indicates a more critical appraisal of the methodology is indicated.

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REFERENCES

1 Zavala DC: Pulmonary hemorrhage in fiberoptic transbronchial biopsy. Chest 70:584-588, 1976

To the Editor:

In response to an article1 written dealing with pulmonary hemorrhage in fiberoptic transbronchial biopsy, Hooper and associates have made several comments to the editor. First, they agree that safety for the patient is of paramount importance; and secondly, they firmly believe that the methodology for transbronchial lung biopsy presented in my article1 is rigid and dogmatic. In my opinion, they are entirely correct on both counts! Our basic disagreement really hinges on the following two factors: (1) the method of insertion of the fiberoptic bronchoscope, namely, the nasal (without tube) vs the oral (via tube) route; and (2) the use of fiberoscopy.

Although convenient for examination of the tracheobronchial tree, transnasal insertion fails to establish an airway and, therefore, should not be used for taking transbronchial biopsies or trying to aspirate a pulmonary abscess. The suction channel of the fiberoptic bronchoscope is too narrow to handle massive flooding of the tracheobronchial tree with blood or thick purulent material. In this respect the new models of instruments with 2.6-mm aspirating channels are helpful but need further trial and evaluation. Nevertheless, with an 8.5-

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bronchogenic carcinoma, 42 percent of all lesions were not visible endoscopically. Thus, when dealing with primary lung cancer, any endoscopist would be at least 40 percent “out of business” without the aid of fluoroscopic guidance (since blind biopsies have an extremely low diagnostic yield). In diffuse pulmonary disease the original transbronchial biopsies, as reported by Anderson and his group at the Mayo Clinic, were performed under fluoroscopic control through an open-tube straight bronchoscope. With experience, Anderson and associates discovered that tactile sensation alone was satisfactory for passing the biopsy forceps to the periphery of the pulmonary bases. Unfortunately, when the forceps is inserted through the long restricted channel of a fiberoptic bronchoscope, tactile sensation is greatly reduced, especially when the distal tip of the fiberoptic bronchoscope is flexed. For this reason, I prefer to rely on fluoroscopic control to position the forceps into the area of involvement.

Hooper and his colleagues are fortunate not to have encountered frightening hemorrhage. How do they propose to handle such a situation, should it occur? My position is that it is far better to be prepared than to wish you had been prepared.

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REFERENCES
1 Zavala DC: Pulmonary hemorrhage in fiberoptic transbronchial biopsy. Chest 70:584-588, 1976

Salivary Levels of Calcium and Potassium as Indicators of Digitalis Toxicity

To the Editor:

Salivary levels of electrolytes have been suggested as indicators of digitalis toxicity; however, no consensus has been reached so far as to the validity of this test. In the present study, the following problems were investigated: (1) the use of unstimulated saliva for detection of digitalis toxicity; and (2) salivary levels of electrolytes as a means of follow-up in patients treated with digitalis.

MATERIALS AND METHODS

The population under study consisted of 65 individuals, as follows: 30 healthy volunteers; 20 patients who were receiving digitalis; and 15 patients with digitalis toxicity. The diagnosis of digitalis toxicity was based on clinical signs and electrocardiographic changes. Serum levels of digoxin were measured by radioimmunoassay as well.

Unstimulated whole saliva was collected by a standard method. Unstimulated saliva was preferred because stimulation changes salivary composition. The level of potassium was analyzed by flame photometry, and the level of calcium was determined by atomic-absorption spectrophotometry.

RESULTS AND DISCUSSION

The results are summarized in Table 1. The difference between the mean values of patients who were receiving digitalis and healthy controls is significant (P < 0.001), and the difference between mean values of patients who were receiving digitalis without toxicity and those with digitalis toxicity is also highly significant (P < 0.001). The overlap of the levels of calcium is smaller than that of the levels of potassium (Table 1). Therefore, it appears that the salivary level of calcium is a better indicator of digitalis toxicity, a finding that is in agreement with the data of Avisser et al.

Another aspect of this study was a follow-up of the patients with digitalis toxicity. A correlation between the clinical condition of the patient and the salivary levels of electrolytes was sought. Salivary samples were collected daily during and after the clinically established digitalis intoxication. In Figure 1, the results of a follow-up of four patients with digitalis toxicity are presented. The arrows show the clinically established days of digitalis intoxication. Treatment with digoxin was stopped on the same day. The decrease in salivary levels of electrolytes followed and paralleled the improvement in each patient's clinical condition.

Thus, salivary levels of electrolytes may be recommended for detection of digitalis toxicity and for follow-up of the large population of patients treated with digitalis. The question remains whether it would be

<table>
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<tr>
<th>Subjects</th>
<th>Calcium, MEq/L</th>
<th>Potassium, MEq/L</th>
<th>Ca++×K+</th>
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<tr>
<td>Healthy individuals</td>
<td>2.6±0.9</td>
<td>20.0±4.2</td>
<td>61±28</td>
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<td></td>
<td>(1.0-5.0)</td>
<td>(14.0-38.0)</td>
<td>(22-140)</td>
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<td>Patients receiving</td>
<td>4.2±1.7</td>
<td>40.0±8.6</td>
<td>176±92</td>
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<tr>
<td>digitalis</td>
<td>(1.3-6.5)</td>
<td>(24.0-49.5)</td>
<td>(33-300)</td>
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<td>Patients with digitalis</td>
<td>12.5±3.0</td>
<td>56.7±16.4</td>
<td>703±329</td>
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<tr>
<td>toxicity</td>
<td>(8.4-14.5)</td>
<td>(40.0-100.0)</td>
<td>(380-1,600)</td>
</tr>
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</table>

*Table values are means ± SD; numbers within parentheses are ranges.

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