When the patient turned onto his right side, further narrowing of the left main-stem bronchus was observed.

**Discussion**

This report demonstrates the development of dyspnea and oxygen desaturation related to partial mechanical obstruction of the left main-stem bronchus when the patient lay on his right side. We believe that these changes are due to the effects of gravity on the mass originating in the left upper lobe surgical stump. With the patient in the left lateral position, the mass was inferior or lower than the left main bronchus and would not affect its patency. In contrast, in the right lateral position, gravity caused the mass to protrude further into the airway of the left main-stem bronchus and thereby decrease ventilation to the left lower lobe. Conceivably, this led to hypoxemia based on low ventilation-perfusion matching in the left lower lobe. Because the patient’s symptoms developed immediately upon turning onto his right side, we believe that the mechanism of the tachypnea and dyspnea was mechanical rather than related to desaturation.

In patients with unilateral lung disease, such as atelectasis or pneumonia, involving either the right or left lung, Remolina and colleagues noted that lower arterial oxygen tension occurred when the involved “sick” lung was dependent as opposed to the lateral position with the “good” lung dependent. Three of the nine patients had primary bronchogenic or metastatic carcinoma involving the lung. The authors postulated that these changes were due to ventilation-perfusion mismatching associated with the gravitational influences on pulmonary blood flow.

Our patient also had bronchogenic carcinoma, but there was no evidence of volume loss or an alveolar filling process on the chest roentgenogram. Fiberoptic bronchoscopic study demonstrated that partial mechanical obstruction contributed to his positional symptoms and oxygen desaturation rather than increased perfusion to dependent lungs with impaired ventilation.

The information obtained in the investigation of our patient provided a physiologic understanding of his complaints and led to an early diagnosis prior to any radiologic changes. Localized radiation therapy was then instituted. Our results showed that oxygenation worsened when the patient was in the lateral position with his “good” or noninvolved lung dependent, and thus “up with the good lung” was most appropriate for his condition. Furthermore, this experience demonstrates the importance of careful interpretation of positional symptoms and physiologic alterations in such patients.

**References**


**Pulmonary Function In Paracoccidioidomycosis (South American Blastomycosis)**

**An Analysis of the Obstructive Defect**

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Comparison of the mean results of routine pulmonary function studies of 17 patients with diffuse pulmonary paracoccidioidomycosis (PM) and manifestations of chronic obstructive pulmonary disease (COPD) to those of 17 matched patients with pure COPD showed no significant differences. These findings were interpreted as fresh evidence suggesting that expiratory obstruction in PM may be secondary to underlying COPD. Other evidence to that effect is discussed.

The lung is involved in almost all patients with paracoccidioidomycosis (PM), one of the most important systemic mycoses in much of Latin America. There is usually a diffuse, polymorphic granulomatous pneumonitis, with infiltrations, areas of consolidation, and occasional small-sized cavitation. Residual fibrotic streaking is common, particularly after treatment. Studies of pulmonary function most often show a predominantly obstructive defect, usually with hypoxemia of varying degree and mechanisms. Since patients with PM are practically always mature male farmers who smoke, obstruction may be caused by underlying chronic obstructive pulmonary disease (COPD). This fact has not been generally considered, and care for patients with PM frequently consists exclusively of fungicidal treatment.

Since nonsmoking patients with PM are exceedingly rare, we undertook to study the relative contribution of non-specific obstruction due to COPD in patients with PM who have manifestations of COPD by comparing the pulmonary function of patients with PM who have manifestations of COPD (PM-COPD) to those of matched patients with pure COPD.

**Materials and Methods**

The patients with PM-COPD were selected from a population of 34 parasitologically proven cases consecutively seen at our laboratory. The patients with COPD were drawn from our files. Selection was based on the possibility of matching a pair of patients from each group on the basis of sex, age, the degrees of dyspnea, clinical hyperinflation, and, on inspiratory and expiratory x-ray studies, the decrease of diaphragmatic motion and the presence of air trapping.

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Smoking habits were the same in seven pairs, the patient with PM COPD smoked slightly more in two, and the patient with COPD smoked more in seven. In one, information was not exact (total, 17 pairs).

Spirometric studies were performed on a 9-L water spirometer coupled to a helium analyzing cathometer (Pulmonet; Godart). Samples of arterial blood and expired air were analyzed for respiratory gases and pH on the Clark and Severinghaus electrodes according to previously discussed methods. The fractional uptake of carbon monoxide (FCO), calculated as the fraction of inspired carbon monoxide minus the fraction of expired carbon monoxide divided by the fraction of inspired carbon monoxide times 100, was determined with a commercially available apparatus (Diffusometer; Godart) which measures the diffusing capacity by the steady-state end-tidal sampling method.

**RESULTS**

The patients with PM COPD had a slightly higher mean ratio of the forced expiratory volume in one second over the vital capacity (FEV1/VC; 51.8±15.2 percent vs 46.8±16.7 percent of predicted), a lower mean VC (83.8±20.2 percent vs 93.2±30.1 percent) and a slightly lower mean residual volume (RV; 171.7±56.4 percent vs 197.3±59.3 percent) than their counterparts with COPD; however, none of these differences was significant at the 5 percent level.

The FEV,VC was higher in the patient with PM COPD in 11 pairs and in the patient with COPD in one pair, and was equal in five pairs. The VC was larger in the patient with PM COPD in six pairs and in the patient with COPD in seven, and was equal in four pairs. The RV, available for 13 pairs, was larger in the patient with PM COPD in four pairs and in the patient with COPD in eight pairs, and was equal in one pair.

Because of missing data points, gas transfer parameters were confronted by a simple comparison of means, in a nonmatched fashion. Mean resting arterial oxygen tension (PaO2), available in 15 patients with PM COPD and five patients with COPD, was 76.8±14.1 mm Hg and 77.2±3.1 mm Hg, respectively. Mean PaO2 after breathing pure oxygen, available in 13 patients with PM COPD and five patients with COPD, was 528.7±76.5 mm Hg and 560.0±44.7 mm Hg, respectively. Mean FCO, available in four patients in each group, was 46.7±6.8 percent for the patients with PM COPD and 47.5±4.4 percent for the patients with COPD. None of the differences between these means was significant at the 5 percent level.

**DISCUSSION**

The absence of significant differences between the means of the results of pulmonary function tests of patients with PM COPD and with COPD suggests that the changes in the group with PM COPD may be due to underlying obstruction rather than to the coexisting infiltrates. One may speculate that if the mycotic inflammation had a considerable impact on function, the results in the patients with PM COPD should be different from those of comparable patients with COPD.

These findings agree with conclusions tentatively drawn from other evidence, namely the lack of endoscopic or pathologic data showing mycotic bronchial lesions capable of causing manifestations of COPD. Autopsies are rare because patients are usually lost to follow-up, as they return to their villages after therapy. In one of our few autopsied cases, that of a treated man with diffuse fibrosis on the x-ray film, bronchi were carefully studied down to the terminal bronchioles, and only typical nonspecific lesions of chronic bronchitis were found.

Tests of pulmonary function before and after specific treatment show no consistent change in obstruction, even with significant radiologic clearing. The decisive data would, of course, be found in the study of nonsmoking patients free of COPD. These are very rare. In the literature, correlation of functional changes to the smoking status in PM has not been reported regularly by others. The only nonsmoking patient in our series (also the only woman) had a normal spirogram (VC of 3,280 ml, 107 percent of predicted, and FEV, of 2,430 ml, 75 percent of VC).

The only evidence for a relationship between PM and COPD comes from Lima Neto, who found that basilar bullae may be prominent and may develop rapidly in patients with PM COPD, suggesting the presence of some special emphysema-forming mechanism in PM.

**REFERENCES**

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