To the Editor:

We agree that a key procedure in the management of malignant pleural effusions is complete evacuation of pleural fluid from the pleural space so that the visceral pleural surface can come into contact with the parietal pleural surface at the time of instillation of the sclerosing agent. We also recommend that chest tube drainage be employed for this purpose.1 Tube drainage should be continued until the chest radiograph shows little or no pleural fluid and pleural space drainage is less than 150 ml per day. Further, complete pleural space drainage avoids the problem of dilution of the sclerosing agent which could impair its efficiency. Pleural symphysis will never be effective if the pleural surfaces are not in contact. An example of this would be in the case of a "trapped lung" from marked carcinomatous involvement of the visceral pleural surface. A clue that this situation exists is in the patient with a low pH-low glucose malignant effusion.2

We made an initial observation that the pH of the sclerosing agent could be an important determinant in the production of pleural symphysis.3 This was based on the results from clinical studies and measurement of the pH of different sclerosing agents. We have pursued this observation with experimental studies.4 We have instilled .01 N hydrochloric acid, which has a pH similar to that of tetracycline, into the rabbit pleural space and found that none of the animals developed pleural symphysis at 30 days. In addition, we have instilled 0.5 percent NaOH (pH = 13) into the rabbit pleural space and found no evidence of pleural symphysis at 30 days. In fact, the pleural space was entirely normal. In this animal model only tetracycline at 35 mg/kg produced pleural symphysis. Based on these experimental data, it appears that the pH of the sclerosing agent is not a critical factor in the production of pleural symphysis. Other properties of the sclerosing agent (in this case tetracycline) must be important in leading to fibrosis in the pleural space. Preliminary data suggest that enhancement of pleural fluid clotting and inhibition of pleural fibrinolysis may be important in this regard.3,4

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Preoperative Pulmonary Preparation of Patients with COPD

To the Editor:

The recent paper on preoperative pulmonary preparation of patients with chronic obstructive pulmonary disease (COPD) by Gracey, Divertie and Didier (Chest 1979; 76:123-129) represents a valuable contribution to our understanding of the role of pulmonary function measurements in predicting the risk of surgical procedures in patients with COPD. I would like to make several comments and raise some questions.

It seems important to emphasize that although changes in pulmonary function measurements before and after a 48-hour preparative regimen did not explain why postoperative pulmonary complications were reduced, these did appear to have been reduced. In the retrospective series which the authors used for comparison,1 the incidence of respiratory complications in 357 men with COPD was 43 percent after surgery for those not given preoperative pulmonary preparation, and 24 percent for those given such preparation. The 19 percent incidence of pulmonary complications in the 134 patients given general anesthesia in the current series is quite similar to the latter value. An "unprepared" group alternated with prepared patients in the present series would have been much preferable as controls; nevertheless, the preoperative regimen, with its associated personal attention, seems to have been impressive in preventing postoperative complications.

I am not surprised that in most patients the response of pulmonary function measurements to the preparatory regimen appeared not to have predictive value for the development of postoperative pulmonary complications. The patients accepted into this study met the generally accepted diagnostic criteria for chronic bronchitis and emphysema. It is well established that little reversibility of airflow obstruction and improvement in arterial blood gas levels would be expected in stable COPD patients after a 48-hour treatment regimen.2 In fact, small but statistically significant improvements were observed in many of the function tests, but as the authors point out, these were of doubtful physiologic significance. It seems highly likely that these physiologic tests do not assess all factors which are important in determining whether postoperative complications do or do not occur. The investigators made the observation that patients who had a daily quantity of sputum that exceeded 60 ml were at an increased risk of postoperative complications. The effects of the regimen on sputum volume was not measured, and there may be other unmeasured factors which are important.

All of the seven patients who required assisted ventilation had thoracic or upper abdominal operations and all had measured FEF25-75% values of less than 50 percent of predicted. These patients are adequately identified by the combination of preoperative pulmonary function and the type of surgery to be done. It does not seem necessary to carry out pulmonary function tests before and after a period of preparation to help predict that this was a high risk group.

The authors present data separately on the predictive value of the FEF25-75% and the FVC (their Fig 2) and the effects of the type of surgery (their Table 3). I wonder whether additional predictive information might come from studying these two variables simultaneously. Combining the upper abdominal and thoracic incisions into one group (UAT) and the lower abdominal, head and neck, bone and joint and miscellaneous operations into a non-UAT group (NUAT) the respiratory complication rates were 18/76 or

References


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23.0 percent and 8/56 or 14.2 percent respectively. It would be of great interest to further subclassify these four groups (UAT and NUAT, with and without complications) according to their preoperative FEV₁. Important information; with predictive value, might emerge.

The authors chose not to include the forced expiratory volume for one second (FEV₁) in their analysis. This index, expressed in liters or as percent predicted, is related to the MVV and I believe is in much wider use than the MVV in clinical pulmonary function laboratories. It would be helpful if some indication could be given of the predictive value of this index for the development of postoperative pulmonary complications.

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REFERENCES

To the Editor:

We appreciate Dr. Snider's comments regarding our article "Preoperative Pulmonary Preparation of Patients with Chronic Obstructive Pulmonary Disease." We agree with his point that it would have been preferable if we had had an "unprepared" group to compare to our prepared group as a control. Unfortunately, as we noted in the article, all the patients were felt to need pulmonary preparation because of the serious nature of their obstructive lung disease and the potential complications of anesthesia and major surgery. We did not feel that we could in good conscience withhold a potentially beneficial preoperative procedure from these patients. We were, therefore, forced to use a similar group of patients previously studied for pulmonary complications of surgery who had not received preoperative pulmonary preparation at our institution, published by Tarhan and associates.

We appreciate Dr. Snider's comments regarding alternative ways of analyzing our data. We analyzed this material in just about every conceivable combination. We will certainly accept Dr. Snider's recommendation, however, and look at these data in the manner he suggests.

We again wish to thank Dr. Snider for his interest in our article and appreciate his excellent comments.

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Pulmonary Artery Stenosis and Renal Artery Stenosis

To the Editor:

I should like to comment on the very interesting article by Carambas et al in Chest 75:402, 1979. The association of pulmonary artery stenosis and renal artery stenosis should raise the question of generalized nonspecific arteritis as a possible differential diagnosis.

In Mexico, this association is not exceptional. Different degrees and types of narrowing and/or obstruction of renal, pulmonary and other arteries have been reported in several series in children.1,2

Obviously, the patient of Carambas and colleagues had a murmur since birth and this might eliminate any possibility of an acquired condition. Still, it may be worthwhile to perform tests which point in the direction of an inflammatory condition such as a positive FPD, Mantoux test, gamma globulins, etc which we often have found in a large percentage of children with arteritis.

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2 Rivera A, Perez C, Perez A. Arch Inst Cardiol Mex 1969; 39:1

Persisting Pneumothorax as a Complication of Chest Suction

To the Editor:

While pneumothorax is generally well treated with only a chest tube and chest bottle, most surgeons apply suction if a significant air leak is present.1,2 Usually, one of the common "bubbler" type or vacuum regulation devices is used, but sometimes these devices can actually block the removal of air from the chest. Two examples are presented.

CASE 1

A 21-year-old student had a chest tube in place for right pneumothorax. There was a moderately large air leak, so a wall-mounted "bubbler" suction device (NCG) was used at 27 mm Hg (20 cm water). The flow through the bubble chamber was kept low to minimize noise. Pneumothorax persisted. It was finally noted that whenever she coughed, the bubbling of air ceased. When she coughed hard, water was pushed out of the air intake tube. The suction device was discontinued, and the pneumothorax resolved in a few hours.

CASE 2

A 20-year-old asthmatic student presented with left tension pneumothorax. A tube was placed, and suction (27 cm H₂O) was applied with a wall-mounted "bubbler" suction device (NCG). After 36 hours, she still had 30 percent pneumothorax. When she coughed, the bubbling of air stopped, and water was pushed up the air inlet tube. She was switched to a fan-operated suction device (Emerson) at 40 cm H₂O. The lung expanded completely. Her air leak persisted. Six days later, the fan-operated device was replaced by the "bubbler." The pneumothorax recurred. The fan-operated suction device was reconnected, and the lung promptly re-expanded. The air leak stopped five days later.

DISCUSSION

Wall suction (600-700 cm H₂O) cannot be applied directly to a chest tube. The bubble-chamber type of vacuum regulator is commonly used to reduce it to a 20-40 cm H₂O