clears the opalescence caused by high cholesterol levels. These cases further expand the array of pleural manifestations in hematologic malignancies.

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CO\textsubscript{2} Retention in Acute Severe Asthma

To the Editor:

I applaud the authors for writing a comprehensive review on asthma (March 2004).\textsuperscript{1} However, I believe that further clarity needs to be given to their section on gas exchange (page 1083). The first paragraph states that the occurrence of hypercapnia is “a result of muscle fatigue and inability to maintain adequate alveolar ventilation.” While muscle fatigue is undeniably a major cause of hypercapnia in acute severe asthma, it has to be pointed out that there are other factors that cause CO\textsubscript{2} retention in these patients.\textsuperscript{2} I will limit this letter to the processes that create increase in dead space.

In addition to the low ventilation/perfusion (V/Q) areas (which cause hypoxia), uneven distribution of ventilation gives rise to regions of alveolar hyperinflation and high V/Q ratios, which cause increase in pulmonary dead space and CO\textsubscript{2} retention. Alterations in regional perfusion from the increased intra-alveolar pressure and hypoxic pulmonary vasoconstriction are believed to contribute to this “dead space” effect. I had two patients with severe asthma in my ICU last year who had persistently high PaCO\textsubscript{2} despite being intubated and receiving minute ventilation of > 10 L. In one of these patients, I even went to the extent of ordering a CT angiogram to eliminate the possibility of pulmonary embolism (which showed only hyperinflation). Needless to say, the PaCO\textsubscript{2} came down to normal levels after the bronchoscopy was corrected.

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Negative Pressure Pulmonary Edema as an Unsuspected Imitator of Acute Lung Injury/ARDS

To the Editor:

Further to the recent review article by Schwarz and Albert\textsuperscript{1} (April 2004), we would like to add negative pressure pulmonary edema (NPPE) as a further important imitator. NPPE may rarely fall into the category of diffuse alveolar hemorrhage (DAH) through damage of the pulmonary capillaries by mechanical disruption of the alveolar-capillary membrane, resulting in diffuse alveolar injury. More usually, pulmonary edema is manifest, with fulfillment of the clinical, physiologic, and radiographic criteria for acute lung injury (ALI)/ARDS.

Several hypotheses have been postulated to explain the pathophysiologic sequelae of NPPE.\textsuperscript{2–5} While early recognition and specific treatment of an underlying condition\textsuperscript{6–9} may rule in NPPE or rule out other causes of DAH, an obvious underlying cause may be absent particularly after emergence from anesthesia and unwitnessed upper airway obstruction. Indeed, symptoms of NPPE may be considerably delayed after extubation.\textsuperscript{9} Although symptoms usually resolve rapidly with restoration and/or maintenance of a patent airway and supplemental oxygen, positive end-expiratory pressure and mechanical ventilation may be required for a prolonged period of time.\textsuperscript{10} Failure to consider NPPE in the differential diagnosis of acute clinical, physiologic, and radiographic changes that fit the criteria for ALI/ARDS may lead to unnecessary and potentially deleterious iatrogenic complications.

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Tumor Necrosis Factor-α in Parapneumonic Effusion

To the Editor:

We read with great interest the study by Porcel et al.1 (January 2004) investigating the role of tumor necrosis factor-α in pleural fluid as a marker of complicated parapneumonic effusions (CPPEs). The results of this study support the results of our previous studies in this regard.2,3 However, we have some reservations regarding the design, statistical analysis, and, therefore, some of the conclusions of the study.

The authors stated that the final decision concerning pleural space drainage was at the discretion of the attending physician, and patients who underwent pleural space drainage were selected as the group of patients having CPPE. However, the criteria that guided the attending physicians to decide that a patient had a CPPE are given very vaguely. If their decision depended on the current acceptable criteria for discrimination between CPPE and uncomplicated parapneumonic effusion (UPPE) [criteria for CPPE were positive pleural fluid culture result or Gram stain for bacteria, and/or pH < 7.20, and/or the presence of loculations in the pleural cavity], it is improper to compare the diagnostic accuracy of the pleural fluid pH for categorizing a parapneumonic effusion (PPE) as complicated, with that of pleural fluid lactate dehydrogenase (LDH), glucose, or tumor necrosis factor-α because, in most patients, the classification of a PPE as complicated or uncomplicated depends, according to the current acceptable criteria, mainly on pH value. It is so because the sensitivity of a positive Gram stain or culture result for CPPE is relatively low, and pH is superior to LDH and glucose in this regard. The same statement is valid also for LDH and glucose if the patient selection in the present study depended on pleural fluid levels of LDH or glucose. Furthermore, two patients in the study population were selected as having UPPE, although they had positive pleural fluid culture results for bacteria. This antagonizes the current acceptable criteria for discrimination between CPPE and UPPE in which, by definition, a culture-positive PPE is a CPPE.4-5 The clinical criteria for discrimination between CPPE and UPPE have to be defined more precisely if the validity of the current acceptable criteria is being reevaluated.

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To the Editor:

We appreciate the comments of Drs. Odeh and Oliven regarding our study in CHEST (January 2004)1 on pleural tumor necrosis factor-α as a marker of complicated parapneumonic effusions (CPPEs). They express concern about the criteria used to classify parapneumonic effusions (PPEs) as uncomplicated or complicated. We followed the definitions established by Light,2 in that the term CPPE refers to those effusions that do not resolve without tube thoracostomy. Drs. Odeh and Oliven failed to recognize that there is no errorless “gold standard” to judge whether the attending physician’s decision for chest tube drainage in the setting of pneumonia is correct. Obviously, clinician judgment about the convenience of tube thoracostomy is a complex process that depends on a variety of either objective criteria (eg, pleural pH, glucose level, lactate dehydrogenase level, culture finding, effusion size, or patient clinical status) or even subjective criteria (eg, physicians’ feeling about the patient’s outcome).

As a matter of fact, a few reports have noted caveats in determining the need for draining PPEs on the basis of biochemical or microbiological criteria. For example, in a retrospective study1 of 62 patients with PPEs, 26 nonpurulent CPPEs (defined as pleural fluid with a pH < 7.20, or a positive Gram stain or culture result) were identified. Thirteen of the 16 patients with CPPEs who were initially treated with antibiotics alone were cured uneventfully. Another retrospective analysis2 of 91 patients with PPEs found that 10 of 22 patients who met one or more criteria for tube thoracostomy (ie, frank purulence, pleural glucose level < 40 mg/dL, pleural pH < 7.00, or pleural lactate dehydrogenase level > 1,000 U/L) recovered without chest tube placement. Undoubtedly, there are some patients with PPEs and poor prognostic variables found in their pleural fluid who can be cured with antibiotic therapy alone. A retrospective update from our series, including 240 patients with PPEs (uncomplicated PPEs, 85 patients; CPPEs, 67 patients; and empyemas, 88 patients; defined as previously reported3), showed that the American College of Chest Physicians guidelines4 and the British Thoracic Society guidelines5 are associated with respective sensitivities of 97% and 98%, and respective specificities of 68% and 56% to discriminate nonpurulent CPPEs from uncomplicated PPEs (unpublished data). Specifically, the conditions of 12 patients with nonpurulent culture-positive pleural fluid samples and 2 patients with empyemas were resolved solely with antibiotic therapy.

Overall, these guidelines perform satisfactorily in the identification of CPPEs, although they lead to some unnecessary chest tube placements, which is a misclassification cost that is acceptable from the clinical standpoint. In conclusion, Drs. Odeh and Oliven are mistaken in suggesting that some pleural fluid char-