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A 68-year-old man with a history of diabetes mellitus, advanced ischemic cardiomyopathy and hemodialysis-dependent renal failure was admitted to the hospital with a one-week history of confusion and weakness. Six months prior to admission, he was noted to have a large left pleural effusion, for which he had refused further workup. The patient denied alcohol use. He smoked three cigarettes/day but had been a heavy smoker previously. On examination, he was afebrile, blood pressure was 85/48 mmHg, paced heart rate 60 beats/minute and respiratory rate 22 breaths/minute. Physical examination revealed decreased breath sounds and crackles over the left chest. Initial chest X-ray showed complete opacification of the left hemithorax and patchy infiltrates on the right lung base [Figure 1A]. Empiric treatment of sepsis was begun with broad spectrum antibiotics and crystalloid volume resuscitation. An ultrasound-guided thoracentesis yielded one liter of serous fluid with a pH of 7.2; total cell count of 450/mm³, 60% neutrophils; total protein 3 g/dl; glucose 32 mg/dl and LDH 790U/L. Cultures grew pan-sensitive Streptococcus pneumoniae. Acid-fast bacilli, fungal stains and cytology of the pleural fluid were negative. Post-thoracentesis chest X-ray demonstrated a decrease in left pleural effusion and left anterior pneumothorax [Figure 1B]. A chest computed tomographic scan revealed a septated area of ex vacuo pneumothorax with collapsed lung and a left pleural effusion [Figure 2]. The patient refused to undergo thoracotomy with decortication and was treated conservatively with chest tube drainage (pigtail indwelling pleural catheter) and a six-week antibiotic course.

Discussion

Chest radiographs obtained after needle thoracentesis often do not divulge procedure-related complications.[1] Yet, in the present report the chest radiograph helped to direct the diagnosis and management of an “unsuspected pneumothorax”.

Trapped lung occurs when the visceral pleura becomes encased with a fibrous peel, often as a result of an inflammatory process, preventing the lung from re-expanding. This creates a negative pressure gradient, which causes a chronic fluid-filled pleural space.[2]

Bronchogenic carcinoma, obstructing a bronchus also leads to trapped (atelectatic) lobes of the lung. Combined right upper and middle lobe atelectasis usually arises from such malignancy. Upper lobe atelectasis may lead to a localized pneumothorax (ex vacuo pneumothorax). Other differentials of trapped lung include chronic pulmonary consolidations and cryptogenic organizing pneumonia or bronchiolitis obliterans organizing pneumonia.[3]

In contrast to pneumothorax, trapped lung radiographically does not appear larger on expiration than on inspiration and the visceral pleural line delineates the scarred lung contour. Because apposition of the visceral and parietal pleura cannot be achieved, sclerosis attempts are rarely successful. In symptomatic patients with underlying normal lung parenchyma the definitive therapy

Figure 1: (A) Posteroanterior chest X-ray showing a large left-sided effusion. (B) Post-thoracentesis chest X-ray demonstrating a lucency overlying the left cardiac silhouette consistent with anterior “pneumothorax”. (C) Left basilar “hydropneumothorax” decreased in size two months after pigtail catheter placement

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Received : 04-06-06
Review completed : 06-08-06
Accepted : 07-08-06
PubMed ID : 119-20
J Postgrad Med 2007;53:
of trapped lung is pleurectomy and decortication. However, extended drainage by pleural catheter may be a reasonable alternative, particularly in patients in whom more invasive procedures may pose too great a risk. [Figure 1C].

References


Source of Support: Nil, Conflict of Interest: None declared.