Answer

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The answer is B. The patient returned in extremis because of a tension pneumothorax. At this time, the emergency physician noted diffuse subcutaneous emphysema extending from her forehead to her inguinal region (Fig. 1).

The Heimlich valve was reopened; there was a huge "whoosh" of air, and the patient's tachypnea resolved. A larger chest tube was placed, and she was admitted to hospital for a video-assisted thoracic surgery procedure to repair the bulla causing the pneumothorax. The patient made an uneventful recovery, although the subcutaneous emphysema took approximately 2 weeks to resolve.

Discussion

Young patients with spontaneous, uncomplicated pneumothoraces can be considered for discharge with a Heimlich valve pneumothorax kit in place. Patients with recurrent pneumothoraces (2 or more), underlying cardiorespiratory pathology, or elderly patients usually require admission.[1,2]

In assessing patients prior to discharge the physician should look for evidence of persistent air leak from the lung lesion, such as bubbling through the water seal. Initially, this is expected as the pneumothorax gradually decompresses; however, the ruptured bullus should (hopefully) seal over, and the air leak should stop. In this case, there was evidence of a persistent leak prior to the patient's first discharge from hospital. It was not documented that anyone checked for evidence of an ongoing leak during her second visit.

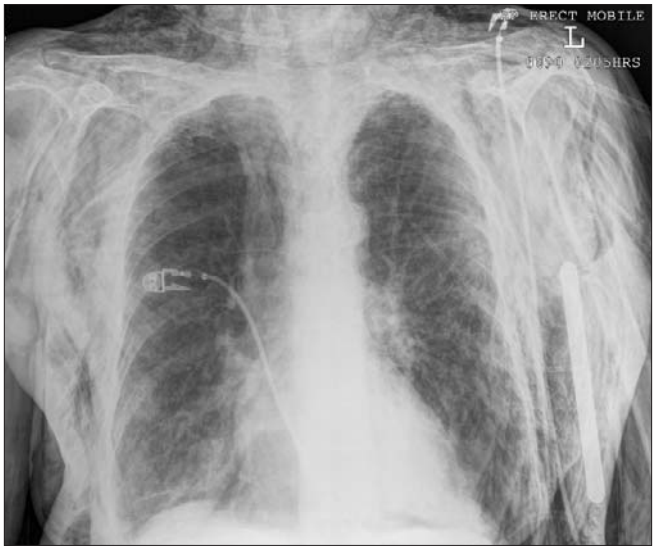

Fig. 1. Chest x-ray, taken after opening the Heimlich valve, showing resolution of the tension pneumothorax but extensive subcutaneous emphysema

This case highlights 3 process issues.

1. Management of this problem as an outpatient in an elderly patient with chronic obstructive pulmonary disease is risky.
2. During the patient's second visit the treating physician should have checked for and documented the presence or absence of an air leak prior to closing the Heimlich valve. If there was evidence of an ongoing leak, the valve should have been left open.
3. When the Heimlich valve is turned off the patient should be asked to remain in the emergency department for 2 to 6 hours for observation. This is followed by a repeat chest radiograph and discharge if there is no evidence of pneumothorax. The patient can be asked to return the following day for a final examination, repeat chest radiograph, and removal of the chest tube if the chest x-ray still shows no resolution of the pneumothorax.

Competing interests: None declared.

Key words: chronic obstructive pulmonary disease; emphysema; pneumothorax; tension; thoracostomy, management

References

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For the Challenge, see page 361.

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Can J Emerg Med 2003;5(5):370