Pneumothorax and deep sulcus sign

A 93-year-old woman who had been a pedestrian was brought to the emergency department after a road traffic accident. On arrival, the patient was conscious and hemodynamically stable with a respiratory rate of 14 breaths/min, pulse rate of 81 beats/min, blood pressure of 141/46 mmHg. The physical examination revealed multiple limb injuries in addition to tenderness on palpation of the right chest wall. A supine chest radiograph showed a deep and radiolucent costophrenic sulcus (Figure 1a, arrows) without subcutaneous emphysema or ribs fracture. The subsequent computed tomography (CT) confirmed an anterior pneumothorax (Figure 1b, asterisk) and a collapsed lung. An intercostal tube drainage was inserted, and a repeat chest radiograph demonstrated reexpansion of the right lung.

Pneumothorax is a common and important clinic condition in polytraumatized or critically ill patients. Supine AP chest radiography is the most practical initial imaging modality in trauma patients, especially while spinal immobilization is necessary. However, up to 76% of all pneumothoraces may be occult when interpreted by trauma teams at the time of admission.1,2 The deep sulcus sign describes a deep and lucent costophrenic angle that extends more inferiorly than usual.3 In the supine position, intrapleural air accumulates from the anteromedial region to the laterocaudal region as the pneumothorax increases.4 In a retrospective review of 44 severely injured patients identified with occult pneumothoraces, the deep sulcus sign is the most common 'missed' radiologic sign.4 Thoracic ultrasonography, as a part of extended focused assessment with sonography for trauma, can be utilized promptly at the bedside for early detection. CT scan is the gold standard for the diagnosis of occult pneumothorax.5

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Conflict of interest: None declared

Figure 1. (a) Supine chest radiography showed an abnormally deep and lucent right costophrenic angle (arrows). (b) Thoracic CT revealed an anterior pneumothorax (asterisk) and a collapsed lung.
References


