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Case report

Giant bulla formation in the lung because of a check-valve mechanism

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ABSTRACT

The pathogenesis of bulla formation has not yet been demonstrated in pathologic examinations or through direct visualization during thoracotomy or thoracoscopic surgery. We present two cases of giant bulla formation after pneumothorax because of cryptogenic organizing pneumonia and lung abscess. The case findings suggested that the pathogenesis was attributable to a check-valve mechanism, secondary to bronchiolitis obliterans, or the presence of an obstructing air leakage due to a lung fistula. The lung fistula had been covered by inflammatory membranes consisting of blood and/or fibrous precipitates with detached visceral pleura.

1. Introduction

Reports on the precise mechanism underlying bulla/cyst formation in the lung are lacking in the literature. Nonetheless, the formation of pneumothorax and/or bulla in patients with cryptogenic organizing pneumonia (COP) or organizing pneumonia (OP) has been previously reported despite its low incidence. We present two cases of pneumothorax that were subsequently complicated by bulla formation following an incidence of COP and the formation of a lung abscess. The pathological findings and postulated schema of these two cases demonstrate the pathogenesis of giant bulla formation.

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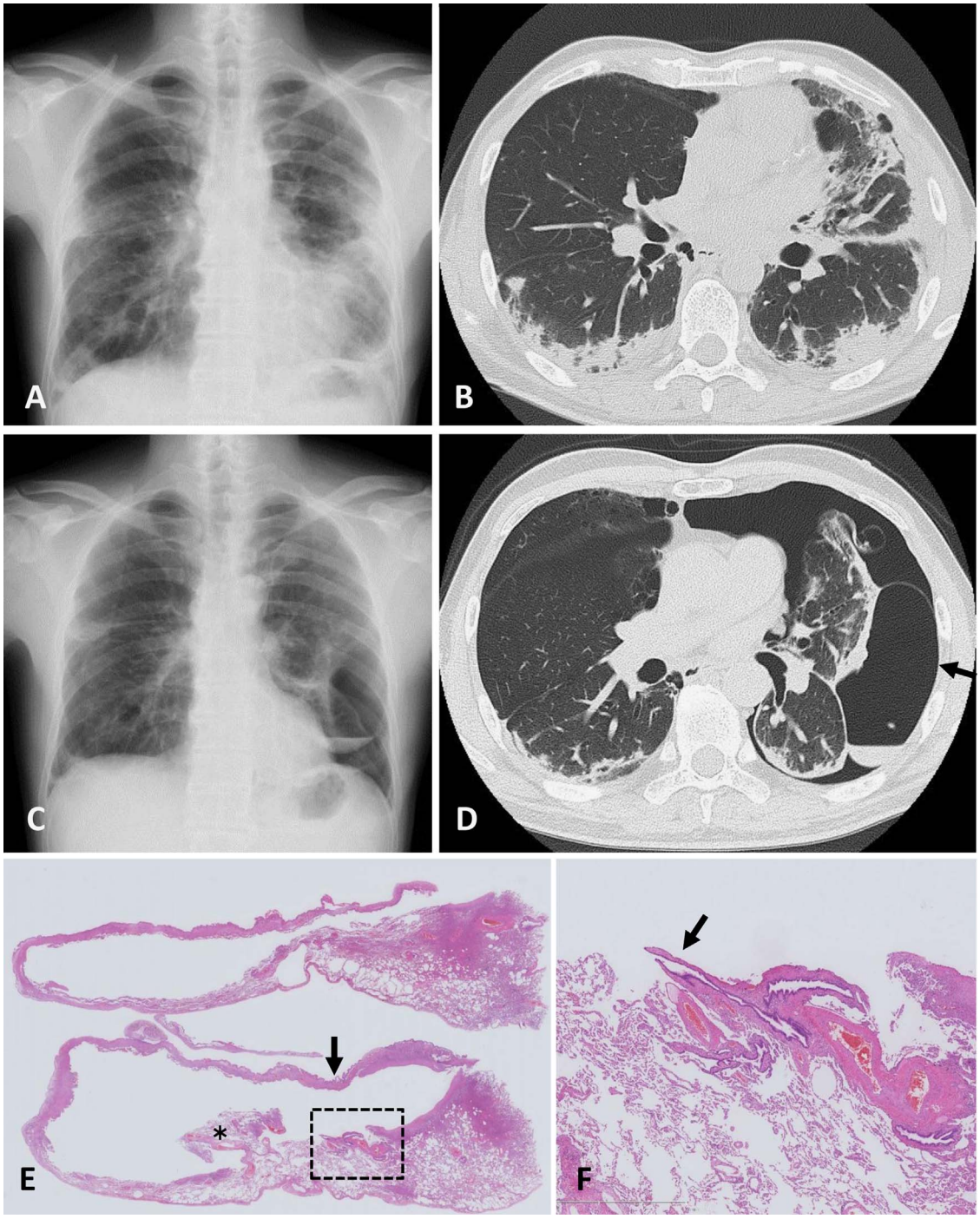

Fig. 1 – A 56-year-old man who developed pneumothorax secondary to chronic organizing pneumonia. (A) A chest radiograph shows bilateral consolidation in the middle to lower lung fields, predominantly on the left side. (B) A chest computed tomography (CT) image shows subpleural consolidation on both lower segments of the lungs and on the lingular segment. (C) A repeat chest radiograph shows a giant bulla with newly developed niveau formation on the left middle to lower lung fields. (D) The giant bulla is thin-walled with fluid in the left lingular to lower lung segments. (E) Photomicrograph of a hematoxylin and eosin-stained section (magnification, 40 ×) shows that most of the resected bulla is composed of protruded visceral pleura (arrow); some parts of the wall contain lung parenchyma (asterisk) with a respiratory bronchiole (dotted square). (F) On further magnification (200 ×), the respiratory bronchiole is clearly visible (arrow).

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