Radiogram of the month: diagnosis

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History

A 24 yr old woman visited her family doctor because of intermittent pain in the chest, radiating into her arms and legs, for three months. She also complained of nausea but no vomitus. She did not cough, or bring up sputum. Since the age of twelve she had smoked 25 cigarettes a day but had stopped smoking two weeks previously. She had never had lung disease before. She had had one uncomplicated pregnancy and delivery. Her past medical history was unremarkable except for a car accident without trauma to the chest. No chest X-ray had been performed at that time. She did not take any medication except for an oral contraceptive and some analgesic drug. She had not travelled outside Holland.

On physical examination she looked healthy and in no respiratory distress. She had no fever. Her blood pressure was normal. No enlarged lymph nodes were palpable. There were normal breath sounds on auscultation of the chest and no pleural friction rub. The liver and spleen were not enlarged. Neurological examination was normal. Laboratory examination: erythrocyte sediementation rate (ESR) 5 mm-hr⁻¹; haemoglobin 8.1 mmol·l⁻¹; leucocytes 7.1×10⁹·l⁻¹ with a normal cell differentiation; normal kidney and liver function tests. Spirometry and body plethysmography were according to the predicted values.

Fig. 1. - Chest roentgenogram, showing a tubular mass lesion in the left middle lung field.

Fig. 2. - Tomography, showing a tubular lesion in the apical part of the left lower lobe.

Fig. 3. - Computed tomography (CT) scan showing a cystic area of hyperinflation peripheral from the tubular shadow.

A chest roentgenogram (fig. 1) showed a mass lesion in the region of the apex of the left lower lobe. Tomography (fig. 2) showed a tubular, diffuse lesion in the apical region of the lower lobe. A vascular malformation could not be excluded, but subsequent digital subtraction angiography of the pulmonary vessels was normal.

At computed tomography (CT) examination (fig. 3) a tubular mass was seen in the region of the lower lobe apical bronchus with several distal bullous spaces extending to the thoracic wall.

Turn page for diagnostic procedures and diagnosis.
Diagnostic procedures

Bronchography (fig. 4) showed no filling of the bronchus of the apex of the left lower lobe.

At bronchoscopy, no ostium of the apex of the left lower lobe was seen. No abnormalities were seen, except for two warty lesions of the left main stem bronchus, that proved to be non-malignant.

Fig. 4. — Bronchogram showing absence of the apical bronchus of the left lower lobe.

Diagnosis

Bronchial atresia of the apical left lower bronchus.

Keywords: Bronchial atresia; computed tomography; hyperinflation.

Discussion

Bronchial atresia is an uncommon condition, probably of congenital origin. For unknown reasons early in embryonic life (between 5–15 wks) focal obliteration of a segmental bronchus occurs with normal distal lung remaning. Air enters the segment normally served by the occluded bronchus via small collateral pathways which exist between the distal bronchiol in the adjacent normal lung and the alveoli of the abnormal segment. This form of collateral ventilation does not permit the discharge of air to occur as rapidly or as completely as it does in a normal region. Thus, the segment becomes pathologically distended, and emphysema supervenes [1–3]. There is also mucus production in the bronchus distal to the atresia, causing mucus impaction.

Recognition of the presence of bronchial atresia can be difficult, since the history and physical findings are negative. Usually pathological changes on a chest X-ray are accidental findings. Because bronchial atresia often presents as a mass lesion, a tumour-like condition is often suspected. Areas of hyperinflation are the clue to the diagnosis of bronchial atresia but are often not appreciated or difficult to see on a plain chest X-ray. Tomography, especially computed tomography, is more sensitive for detection of areas of hyperinflation [4, 5]. CT can also show the relationship between the mass lesion and the distal areas of hyperinflation to a better extent. Bronchography and bronchoscopy show the atretic segmental bronchus.

References