Case 1289

Congenital bronchial atresia
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Section: Chest imaging
Imaging Technique: Digital radiography
Imaging Technique: CT
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Case Type: Clinical Cases
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Clinical History:

Two cases, each referred for evaluation of an opacity detected on chest x-ray.

Imaging Findings:

Case 1: Age = 26 years, Sex = Female
Case 2: Age = 60 years, Sex = Female

Case 1 (Fig. 1): An asymptomatic female with unremarkable clinical data, was referred for evaluation of a branching opacity surrounded by an area of hyperlucency in the upper left lung detected on a routine chest x-ray. A CT scan of the chest was performed and revealed a low density inside the branching opacity, a sparse vasculature of the region and the absence of mediastinal shift. The radiological findings were compatible with congenital bronchial atresia.

Case 2 (Fig. 2): The patient, a non-smoking female with chronic cough and recurrent respiratory tract infections, was referred for CT because of the finding of a tubular opacity in the lower right lung on chest x-ray performed during a symptomatic episode. There was also increased radiolucency in the involved lung. No signs of compression or shift of the adjacent structures were detected. CT confirmed the homogeneous and fluid density of the mass. The surrounded lung has low density due to the overinflation and poor vascularization. The radiological findings were compatible with bronchial atresia and a secondary cause of bronchial obstruction was ruled out.

Discussion:

Congenital bronchial atresia (CBA) results from the abnormal development of a segmental or subsegmental bronchus causing focal obliteration but maintaining a normal development of distal structures. Since these patients are usually asymptomatic, the lesion is accidentally discovered on a routine chest x-ray performed for some other reason. The patients may, however, complain of mild respiratory symptoms such as chronic cough or fever. Sometimes they may present with recurrent infections.

Bronchial atresia is most commonly seen in the upper left lobe, as in our first case, followed by upper right and middle pulmonary lobes.

Chest x-ray shows a tubular branching opacity representing a bronchocoele and the accompanying area of focal hyperlucency is better depicted by computed tomography (CT). There are no signs of contralateral mediastinal shift or significant collapse of adjacent lobes. Expiratory air trapping is present in the involved segments and vascular supply is diminished. A typical feature that allows differentiation of bronchial atresia from lobar emphysema is the finding of a mucous plug just lateral to the hilum. This round or finger-like shadow is produced by mucous impaction of bronchi immediately distal to the atretic lumen. The hyperinflation is attributed to collateral drift of air from adjacent normally ventilated lung. Although the typical features can be easily recognized on conventional radiology, CT is in general needed to make an unequivocal diagnosis and to exclude acquired causes for proximal bronchial obstruction such as tumour, foreign body impaction or inflammatory strictures. The CT features of bronchial atresia...
include over-aerated lung distal to the atresia and a round, ovoid, or branching density near the hilum, representing mucoid impaction just beyond the atresic bronchus (bronchocoele). Although unnecessary for diagnosis, thoracic MRI, when performed, reveals the bronchocoele as a branching opacity displaying high signal intensity on T1-w and T2-w images consistent with a high level of protein content. Because of the presence of focal hyperlucency, conditions such as congenital lobar emphysema (CLE) should also be ruled out. However, this surgical lesion tends to affect an entire lobe with collapse of adjacent lung and contralateral mediastinal shift due to overinflation. The presence of the bronchocoele allows exclusion of CLE.

The presentation of case 1 is considered typical. In the second patient, CBA had an unusual location, requiring the consideration of other differential diagnoses such as arteriovenous malformation (AVM).

Since the spectrum of CBA findings can be accurately defined by imaging techniques, surgery is unnecessary for the asymptomatic patient.

**Differential Diagnosis List:** Congenital bronchial atresia

**Final Diagnosis:** Congenital bronchial atresia

**References:**


Description: Digital chest x-ray (PA view). Branching opacity in the upper and middle left lung fields.

Origin:
Description: Scan through the upper lobe: branching opacity in the apico-posterior segment of the left lung surrounded by an area of focal hyperlucency. Origin:
Description: Same scan as Fig. 1b (soft tissue window). The branching opacity with 35 HU density.
Origin:
Description: Chest CT after contrast. There is no enhancement (35 HU) of the lesion. Origin:
Description: Chest topogram. Tubular opacity in the middle and lower right lung fields. We can also see cardiac ectasy and elevation of the right diaphragm. Origin:
**Description:** Chest CT. Scan through the lower lobe: tubular opacity in the right lower lobe surrounded by an area of focal hyperlucency. **Origin:**
Description: Same scan as in Fig. 2b (soft tissue window). The tubular opacity shows a liquid density inside the lesion (6 HU). Origin:
Description: CT after contrast. There is no enhancement of the lesion. Origin:

Description: HRCT. Better visualisation of the hyperlucency surrounding the tubular opacity. Origin:
Description: Volume-rendered reconstruction using a MIP algorithm (axial view): focal obliteration of the bronchial tree with distal bronchocoele. Origin: