Hyperinflation surrounding a solitary nodule

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A 28-year-old asymptomatic woman had a chest X-ray as part of the preoperative workup for breast aesthetic surgery. The chest X-ray showed a nodular density in the right lower lobe, a finding that was confirmed by CT.

The detection of a solitary pulmonary nodule on imaging is worrisome because one of its most common etiologies is bronchogenic carcinoma. Therefore, in the initial assessment of such a nodule, it is essential to determine whether it meets the imaging criteria for benignity. The CT scan showed a lobulated nodule surrounded by an area of hyperinflation (Figure 1A). The image acquired during expiration more clearly showed the area of air trapping (Figure 1B). In the case reported here, the key to the diagnosis is the area of air trapping that surrounded the nodule. This finding is highly suggestive of bronchial atresia.

Bronchial atresia is an uncommon congenital anomaly, characterized by interruption of a bronchus with mucus accumulation in the distal bronchial stump (mucocele or bronchocele). This change is accompanied by hyperinflation of the lung parenchyma of the obstructed segment, as a result of collateral ventilation through pores of Kohn, channels of Lambert, and interbronchiolar channels.[1] Bronchial atresia is a benign condition that is usually asymptomatic and is often diagnosed incidentally. In asymptomatic cases, surgery is not indicated. The approach is conservative. Some patients can have recurrent infections, in which case surgical resection should be considered.

The differential diagnosis of bronchial atresia includes other congenital diseases that can result in areas of decreased lung parenchymal density, such as cystic adenomatoid malformations, pulmonary sequestration, congenital lung cysts, and congenital lobar emphysema.[2] In the first three, well-defined walls usually separate the hypodense area from the surrounding normal parenchyma. Although hyperinflation due to lobar emphysema can be very similar to that due to bronchial atresia, the absence of mucocele establishes the differential diagnosis. It is important to note that most of the etiologies seen in children, even congenital ones, can also be seen in adults, because these anomalies usually have a benign course, patients often remaining asymptomatic into adulthood. Although the mucocele had a nodular appearance in the case reported here, it often has an oval or branching tubular appearance. In such cases, the differential diagnosis includes other abnormalities that cause mucoid impaction, such as allergic bronchopulmonary aspergillosis and cystic fibrosis, as well as vascular malformations. However, those conditions are not associated with hyperinflation of the surrounding parenchyma. In summary, the finding of a nodular, oval, or branching tubular lesion with hyperinflation of the surrounding lung parenchyma is highly suggestive of bronchial atresia.

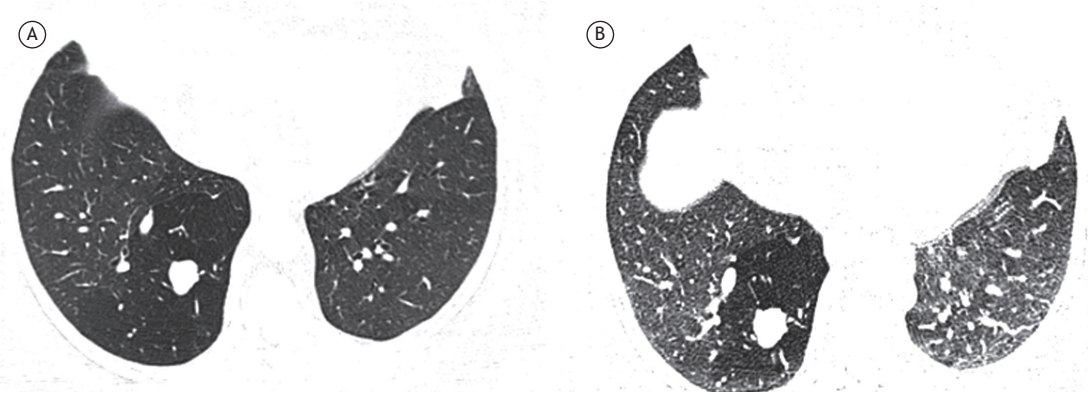

Figure 1. Axial CT scans of the chest, with lung window settings, at the level of the lung bases, acquired during inspiration (in A) and expiration (in B), showing a lobulated nodule in the posterior basal segment of the right lower lobe, with surrounding hyperinflation (air trapping), which is seen more clearly in the image acquired during expiration (in B).

REFERENCES

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