



## Paraseptal emphysema

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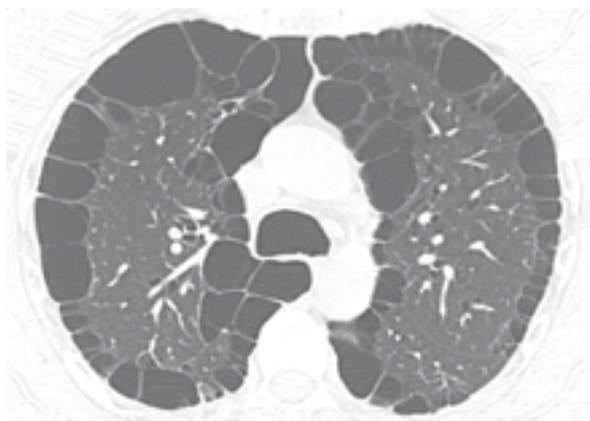
A 35-year-old man presented with a two-year history of dry cough and progressive dyspnea that had recently worsened. He had been using marijuana since he was 11 years old. Chest CT revealed a single layer of multiple subpleural cystic spaces (Figure 1).

Basically, subpleural cystic spaces have two differential diagnoses: honeycombing and paraseptal emphysema. Honeycombing is a CT pattern that consists of multiple contiguous cysts that occur in layers and are located in the subpleural region. Histologically, honeycombing consists of lung cysts resulting from the destruction of distal air spaces due to fibrosis of the lung parenchyma, accompanied by loss of acinar and bronchiolar architecture. In summary, the finding of lung honeycombing means the presence of fibrosis and is an important criterion for the diagnosis of usual interstitial pneumonia.<sup>(1)</sup>

Emphysema is pathologically characterized by abnormal, permanent enlargement of air spaces distal to the terminal bronchiole, accompanied by destruction of alveolar walls. The classification of emphysema is traditionally based on the disease distribution in the secondary pulmonary lobules. The principal types are centriacinar or centrilobular emphysema, paraseptal or distal acinar emphysema, and panacinar or panlobular emphysema. CT findings consist of areas of low attenuation, typically without visible walls. In paraseptal emphysema, there

is permanent enlargement of the distal region of the secondary pulmonary lobule, accompanied by destruction of alveolar ducts and sacs and by dilated alveoli that are located subpleurally adjacent to the interlobular septa. Less severe forms of paraseptal emphysema are difficult to detect on chest x-rays. On CT, subpleural cystic spaces are seen, possibly separated by intact interlobular septa. Paraseptal emphysema is characteristically bounded by pleural surface or interlobular septa. The anterior and posterior portions of the upper lobes and the posterior portions of the lower lobes are most often affected. This form of emphysema may be accompanied by bullae. If it occurs alone or is the predominant type, paraseptal emphysema tends not to cause any respiratory symptoms, and therefore it is often underrecognized clinically.<sup>(2)</sup>

Paraseptal emphysema is more common in marijuana smokers than in tobacco-only smokers. It appears that certain maneuvers performed by marijuana smokers, such as inhalation with the Valsalva maneuver, can lead to barotrauma and formation of apical bullae. Paraseptal emphysema is the predominant pattern seen in marijuana smokers, while centrilobular emphysema is more often seen in tobacco-only smokers. This may represent an earlier stage of apical bulla formation reported in marijuana smokers. Our patient was a heavy marijuana smoker who developed paraseptal emphysema.<sup>(3)</sup>



**Figure 1.** An axial CT scan at the level of the upper lobes shows a single layer of subpleural cystic spaces consistent with paraseptal emphysema.

### REFERENCES

1. Marchiori E, Hochhegger B, Zanetti G. Honeycombing. <https://doi.org/10.1590/S1806-37562017000000232>
2. Hochhegger B, Marchiori E, Rodrigues R, Mançano A, Jasinowodolinski D, Chate RC, et al. Consensus statement on thoracic radiology terminology in Portuguese used in Brazil and in Portugal [published correction appears in J Bras Pneumol. 2022 Jan 10;47(6):e20200595errata]. J Bras Pneumol. 2021;47(5):e20200595. <https://doi.org/10.36416/1806-3756/e20200595>
3. Murtha L, Sathiadoss P, Salameh JP, McInnes MDF, Revah G. Chest CT Findings in Marijuana Smokers. Radiology. 2023;307(1):e212611. <https://doi.org/10.1148/radiol.212611>

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