# Mosaic attenuation

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A 48-year-old woman presented with a 1-year history of tiredness, progressive dyspnea, dry cough, and weight loss (16 kg in 1 year). Laboratory test results were normal. Chest CT revealed a mosaic attenuation pattern (MAP; Figure 1).

Chest CT scans basically show the MAP. By definition, mosaic attenuation is a CT pattern in which areas of differing attenuation are found diffusely distributed throughout the lung parenchyma. These areas have well-defined borders, which correspond to the borders of the secondary pulmonary lobules or to a set of them. An MAP may be due to vascular diseases, small airways diseases, and parenchymal diseases.[1]

The main example of vascular disease causing an MAP is pulmonary hypertension due to chronic pulmonary thromboembolism. In such cases, the areas of hypoattenuation correspond to hypoperfusion zones, and the areas of hyperattenuation correspond to zones with normal vascularization or increased perfusion. Signs of chronic thromboembolism that can aid in diagnosis include filling defects in the pulmonary arteries, serpiginous pulmonary arteries, and bronchial artery hypertrophy. Another important sign is flow redistribution, with more pronounced vascularization in the hyperattenuated areas and hypoflow in the hypoattenuated areas. Signs of pulmonary hypertension, such as right ventricular enlargement, interventricular septal bowing, and pulmonary artery dilatation, may also be present.

Parenchymal involvement characterized by sparse areas of ground-glass attenuation can be seen in various diseases, such as pulmonary hemorrhage, *Pneumocystis jirovecii* pneumonia, and alveolar proteinosis. In such cases, the abnormal parenchyma corresponds to the denser zones, which show ground-glass attenuation, and the less dense zones correspond to the normal parenchyma. The presence of interlobular septal thickening reinforces this possibility.

The main small airways diseases that can present with an MAP are bronchiolitis (including hypersensitivity pneumonitis)[2] and bronchial asthma. In such cases, there is basically air trapping, with the lower density zones corresponding to the abnormal areas, where the air is trapped as a result of partial bronchial or bronchiolar obstruction. These areas are best shown on serial CT scans obtained during expiration. Frequently, bronchial wall thickening is also observed, with or without dilatation or mucous plugs. The number and caliber of vessels may decrease as a result of hypoxic vasoconstriction.

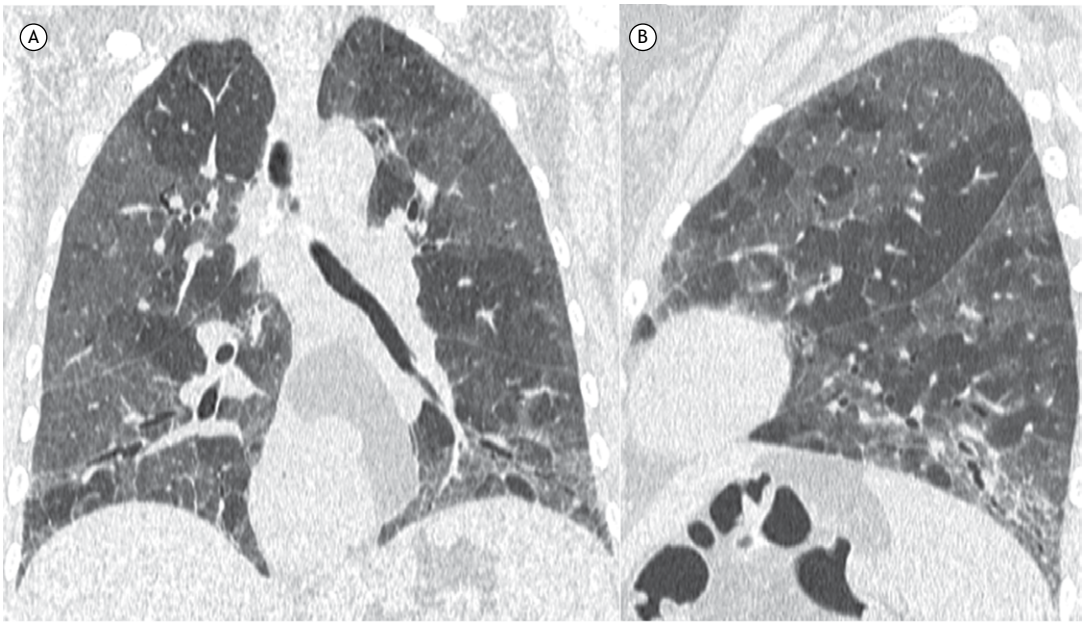


**Figure 1.** Coronal and sagittal chest CT reconstructions (A and B, respectively) showing areas of differing attenuation in the lung parenchyma. Slices obtained during expiration (not shown) revealed air trapping. Also note reticular opacities and bronchiolectasis at the lung bases.

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Therefore, in practical terms, the aforementioned causes can be differentiated on CT by taking two major factors in consideration: the presence or absence of air trapping; and the evaluation of the pattern of pulmonary vascularization. Our patient did not present with changes in pulmonary vascularization or in arterial blood flow redistribution, but there was air trapping; therefore, she was classified as having small airways impairment. She had a history of sleeping in a room with more than twenty bird cages. The final diagnosis was hypersensitivity pneumonitis.

## REFERENCES


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