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Hypodense consolidation

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A 72-year-old male patient with advanced Alzheimer's disease presented with chronic cough and dyspnea. Chest CT showed extensive areas of consolidation in the lower lobes (Figure 1).

Pulmonary consolidation is a common imaging finding, with a broad differential diagnosis, given that airspace filling can be caused by the accumulation of various endogenous materials, such as exudates, transudates, blood, and neoplastic cells, as well as of exogenous materials, such as fat (in lipoid pneumonia) and calcium (in pulmonary alveolar microlithiasis).

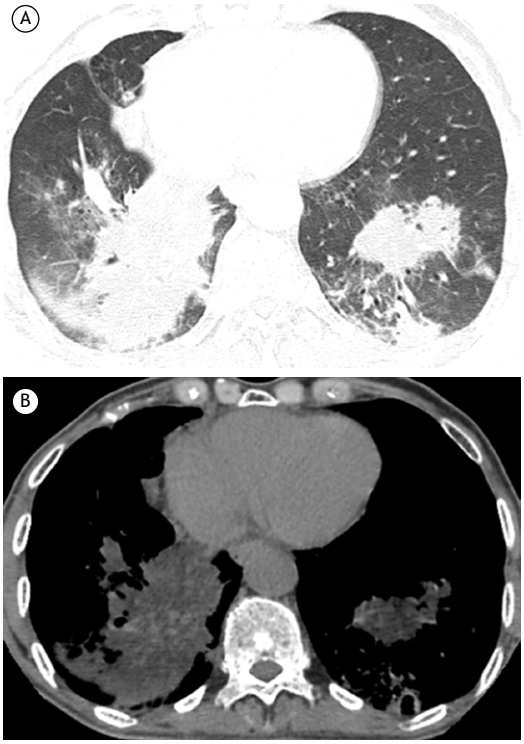

Figure 1. Axial CT scans at the level of the lower lobes, with lung and mediastinal window settings (A and B, respectively), showing bilateral areas of consolidation. Note that the density of the consolidation is lower than the density of the heart, with negative values ranging from −13 to −86 Hounsfield units.

The differential diagnosis of pulmonary consolidation can be narrowed by taking the density of consolidation, as measured in Hounsfield units (HU), into account. In most cases, the consolidation has soft-tissue density similar to that of the heart or liver. In addition, the consolidation can be hyperdense or hypodense relative to these structures. Low density within the consolidation can be due to areas of necrosis or fat.[1]

Within areas of pulmonary consolidation, necrotic portions show low density, although the values are usually positive, whereas fatty areas show negative density values, ranging from −30 HU to −150 HU. Among lung lesions, negative density can be seen within nodules, masses, or areas of consolidation. Areas of consolidation with fat density are usually indicative of lipoid pneumonia.

Exogenous lipoid pneumonia is an uncommon condition resulting from inhalation or aspiration of oils, most commonly mineral oil. In adults, the most common cause of exogenous lipoid pneumonia is the use of mineral oil for the treatment of constipation. In the elderly, exogenous lipoid pneumonia usually develops chronically and progressively, presenting with chronic cough and dyspnea. In addition, the clinical presentation may mimic that of bacterial pneumonia, with fever and cough.[2-4]

The diagnosis of exogenous lipoid pneumonia is based on a history of exposure to oil and characteristic imaging findings, and/or lipid-laden macrophages in sputum or BAL samples. Although a history of ingestion or inhalation of oil is an extremely important piece of information, rarely is it provided spontaneously by the patient, which makes diagnosis difficult. Often, that information is obtained only retrospectively, after focused history taking. On imaging, the most characteristic finding is lung consolidation with fat attenuation (i.e., negative attenuation values). Negative density values, between −30 HU and −150 HU, are highly suggestive of intrapulmonary fat.[2-4]

Our patient showed negative density values, ranging from −13 to −86 HU, and reported having used mineral oil for the treatment of chronic constipation. The final diagnosis was lipoid pneumonia.

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