**GROUND-GLASS OPACITY ON HRCT. A GUIDE TO DIAGNOSIS**


**Objectives.** To define ground-glass opacity (GGO) and to show how it can be detected on HRCT scans for diffuse lung diseases. To make diagnosis easier, by indicating the findings that narrow down the differential diagnosis. To develop a diagnostic algorithm.

**Methods.** GGO is the slight increase of pulmonary attenuation, which permits seeing the underlying vessels and walls of the bronchi. It occurs when there is a decrease in pulmonary air for partial filling or partial collapse of air spaces, moderate thickening of the alveolar interface or an increase of the capillary volume. Therefore, it is a non-specific finding in which the underlying pulmonary alteration is below the limit of resolution of the HRCT.

Usually, it indicates active disease that is potentially reversible with the appropriate treatment, but if it is associated with signs of fibrosis, such as honeycomb cysts, traction bronchiectasis, distortion of the parenchymal architecture and irregular thickening of the interlobular septa, it probably indicates fibrosis.

GGO is a very frequent finding in HRCT scans for diffuse infiltrative lung diseases. Detection is the first problem in its evaluation. GGO was detected by the ‘dark bronchus’ sign, which is a lower attenuation of air in the bronchus than in the lung surrounding it, and Minimum Intensity Projection (miP) reconstructions. False diagnoses of GGO stem from technical errors, respiratory and cardiac movements, poor inspiration and hyperventilation in the dependent lung areas.

Subsequently, it was determined: 1) whether GGO is the predominant pattern of the disease (when GGO is an associated finding, the differential diagnosis is based on the other dominant alterations); 2) whether its distribution is patchy, diffuse or nodular; 3) whether or not it is accompanied by signs of fibrosis; 4) whether the disease is acute, subacute or chronic.

**Conclusions:** The ‘dark bronchus’ sign and miP reconstructions help to detect and quantify GGO.

Important criteria for narrowing down the differential diagnosis are: The predominance and distribution of GGO, the presence or absence of fibrosis and clinical and functional associations.

**References**

11. Dalal PU, Hansell DM. High-resolution computed tomography of the lungs: the ‘dark bronchus’ sign and mIP reformatted image show bilateral, patchy air trapping (C). mIP reconstructions help to detect honeycombing (blue arrows) and traction bronchiectasis (yellow arrow) in a patient with idiopathic pulmonary fibrosis.

**PATCH OR DIFFUSE GGO WITHOUT FIBROSIS, ACUTE DISEASE (1)**

**PULMONARY ODEMA**

**PULMONARY HAEMORRHAGE**

**NECROSYS TIC BURST, AVI RAL VENOULITIS**

**ACUTE EOSINOPHILIC PNEUMONIA**

**RADIATION PNEUMONITIS (ACUTE PHASE)**

**GROUND-GLASS OPACITY (GGO)**

**a) Axial HRCT scan shows patchy GGO, with thickened septal lines and areas of consolidation (green arrow).**

**NUDULAR GGO**

**ACUTE (1) SUBACUTE OR CHRONIC (2) ACUTE (3) SUBACUTE OR CHRONIC (4)**

**PATCH OR DIFFUSE GGO WITH FIBROSIS, ACUTE DISEASE (3)**

**ACUTE INTERSTITIAL PNEUMONIA**

**ARDS**

**CONCLUSIONS:** The ‘dark bronchus’ sign and miP reconstructions help to detect and quantify GGO.

**PATCH OR DIFFUSE GGO WITH FIBROSIS, CHRONIC DISEASE (4)**

**IPPs:** Nonspecific interstitial pneumonia

**Disseminated interstitial pneumonia**

**Collagen vascular diseases**

**Hypersensitivity pneumonitis**

**Pulmonary haemorrhage**

**Pulmonary oedema**

**Infectious bronchiolitis**

**Pneumocystis Jiroveci and viral pneumonias**

**ACUTE (1)**

**ACUTE (2)**

**ACUTE (3)**

**ACUTE (4)**

**ACHILLES HEEL**

**REFERENCES**