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Case Report

Fibrotic and Emphysematous Backgrounds in Bilateral Covid-19 Pneumonia: a Suggestive Case Report at Computed Tomography

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Abstract

Covid-19 pneumonia can rapidly lead to serious pulmonary complications associated with pneumonia, posing a delicate challenge for the clinicians, especially radiologists, who are committed to ensuring a timely and early diagnosis of the disease. Serial chest imaging enable clinicians to better monitor disease progression and identify potential complications early which may decrease the mortality and morbidity associated with Covid-19 pneumonia. In our case we describe a patient with bilateral Covid-19 pneumonia, that collaterally had bilateral emphysematous background and pulmonary fibrosis, documented at Computed Tomography (CT).

Keywords: Emphysematous Background Covid-19, Pneumonia, Computed Tomography

Background

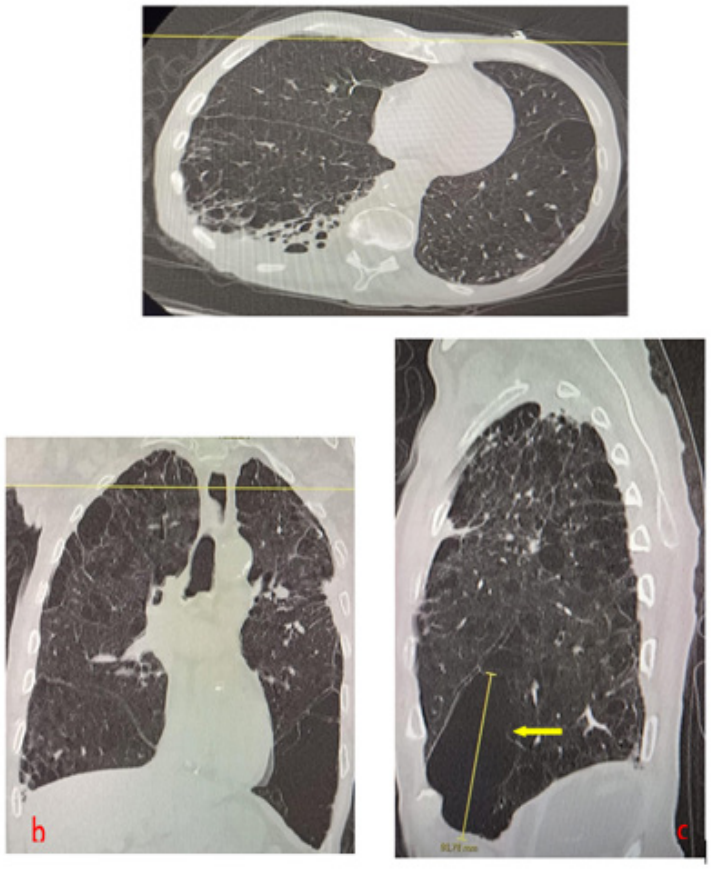
Pneumonia is the most important manifestation of Covid-19 infection, whilst acute respiratory distress syndrome (ARDS) is the most severe sequela. Presence of pleural effusion, lung cavitation, fibrosis and emphysemas are associated with severe disease and often carry poorer prognosis [1].

Many studies and cases have reported common Covid-19 chest manifestation on chest x-ray (CXR) and CT [2-6]. The use of CT imaging in the diagnosis and follow-up had rapidly grown, and radiological patterns along the disease course are increasingly understood. Chest CT imaging has been demonstrated more sensitive than chest radiography to identify the manifestations of Covid-19 pneumonia, for the severity assessment and monitoring of the disease [7].

Case Presentation

We report a case of an 82-year-old man presented to the Emergency Department with fever, cough and dyspnea. Clinical exam ination revealed an elevated body temperature of 38°C, while laboratory blood tests revealed elevated neutrophil count, raised C-reactive protein; the naso- pharyngeal sampling was positive for SARS-CoV-2.

High Resolution CT scan of the chest was urgently done (Picture 1, a-c), in basal conditions, and the images so obtained were analyzed with a slice-thickness of 1.2 mm and MPR reconstructions (axial, sagittal, and oronal).



Picture 1 (a-c): Chest X-ray showed the bilateral emphysematous background and pulmonary fibrosis in bilateral Covid-19 pneumonia; the most voluminous bulla of pulmonary emphysema (9 cms) in the left lung (yellow arrow).

CT had documented in both lungsthe presence of a diffuse bilateral emphysematous background, characterised by the presence of multiple and diffuse bilateral pulmonary emphysema bullae, the most voluminous of them of about 9 cms, in the left lung. CT had also shown a bilateral fibrotic thickening of the pulmonary interstitium, also with thickened areas with a ground-glass pattern and interstitial thickenings. There were not pleural- pericardial effusions.

The patient was immediately hospitalized and treated and, after theree weeks of drug therapy, he had returned to home.

Discussion

Chest imaging is indicated in Covid-19 patients for establishing a baseline for the patient's pulmonary condition, identification of other comorbidities and for monitoring the progression of disease. In the event of clinical deterioration, imaging assessment helps to diagnose disease progression and complications, such as pulmonary fibrosis, heart failure or vascular diseases. Typical chest findings in Covid-19 patients show bilateral lung involvement with patchy or asymmetric diffuse air space opacities, predominantly in a peripheral, posterior distribution and mainly in the lower lobes. In later stages of the disease, CT may show increased GGO, dispersed consolidation, reticular opacities, crazy-paving, bronchiectasis, pleural thickening, septal thickening and involvement of subpleural region. As the disease progresses, atypical CT features such as pleural and pericardial effusion, cystic changes, emphysematous riacutization, and nodules may be present [8-12].

Conclusions

Computed Tomography had an important role in the diagnosis and severity evaluation of Covid-19 pneumonia, because it investigates very well the dynamic CT changes in different stages of the disease, and also in the follow-up of the patients. CT scan can show a very important detection in the radiological alterations resembling a pattern of combined pulmonary Covid-19 pneumonia and pulmonary emphysema, with its background and other complications. Covid-19 pulmonary infection can leave a chronic impact on respiratory function, causing a clinical worsening of pre- existing conditions, such as emphysema and pulmonary fibrosis. On average, an adult may require from six to twelve months to recover, although this may not always be complete. This is caused by pulmonary fibrosis, which causes stiffening of the lung tissue affected by the infection, resulting in a further reduction in respiratory exchange functionality. A prompt recognition of these complications, a "target" ventilation and a drug therapy for the patients, and a follow-up strategy for post-Covid19 patients, are very important to evaluate the response to treatment and/or to document disease progression, making the direction of care for such patients and reduce their morbidity and mortality.

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