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CASE REPORT
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PULMONARY ADENOCARCINOMA, A MASQUERADER OF DIFFUSE PARENCHYMAL LUNG DISEASE: A CLINICAL CASE REPORT

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Abstract:
Lung cancer has long intrigued pulmonologists because it seems to have unique epidemiologic, pathologic and clinical features. Lung cancer is one of the most prevalent cancers worldwide. It is typically classified into small-cell lung cancer (SCLC) and the more prevalent non-small-cell lung cancer (NSCLC)[1]. Lung adenocarcinoma is a subtype of NSCLC that originates mainly in the mucosal glands and accounts for roughly 40% of all lung malignancies and is usually presented with cough, dyspnea, chest pain and weight loss, with some symptom overlap with other lung diseases such as Diffuse parenchymal lung diseases.[2] DPLD can present in a range from nodules, ground glassing ,organising pneumonias to diffuse alveolar and interstitial lung involvement, while lung cancers are mostly presented with infiltrative mass, thick-walled cavitations or a solitary nodule with spiculated borders.[5] Lung cancer is the most common cancer worldwide. On imaging, it typically presents as mass or nodule. [5]Recognition of these typical cases is often straightforward, whereas diagnosis of uncommon manifestations of primary lung cancer is far more challenging. Lung cancer can mimic a variety of benign entities, including pneumonia, lung abscess, postinfectious scarring, atelectasis, a mediastinal mass, emphysema and granulomatous diseases. Lung adenocarcinoma can appear as ground glass nodules, consolidative opacity, or solid mass lesions on computed tomography (CT) [6]. It is a glandular tumor with mucin-producing cells that stain positively for mucin on histology
It would be a misapprehension if the diagnosis is made solely on radiology. Here we present the case of a 54-year-old Indian male,non smoker, who presented with a 2-month history of dry cough and shortness of breath, decreased appatite and weight loss within one month. Chest imaging showed diffuse areas of ground glass attenuation and air space consolidation. The initial impression was that of one with a kind of non-resolving pneumonia with interstitial lung disease ,eosinophilic lung disease ,rarely bronchoalveolar carcinoma as one of the many differentials. Subsequent bronchoscopy with a transbronchial lung cryobiopsy confirmed the diagnosis adenocarcinoma of lung.

Introduction

Lung adenocarcinoma (LA) is the most frequent histological subtype of lung cancer worldwide. This condition is categorized from preinvasive lesions to metastatic adenocarcinoma .Smoking is the most common responsible risk factor for LA so far, along with a family history of lung cancer, occupational

exposure, and genetic mutations .Their most frequent radiological demonstration is on chest CT scans [1,2,5,6]. Lung adenocarcinoma can appear as ground glass nodules with most frequent radiological demonstration of ground-glass, part-solid, and solid nodules, focal or diffuse parenchymal consolidation, or multifocal lesions , or solid mass lesions on computed tomography (CT) . Hence, this type of LADC is also known as pneumonic-type lung adenocarcinoma (PLADC), which refers to primary lung adenocarcinoma with a radiological pneumonic presentation and usually presents consolidative opacities].[8]

PLADC is a heterogeneous disease in which different patterns might be identified based on clinical, imaging, and histopathological manifestations .It can be focal if <50% of the parenchyma is involved and a disffuse if more than 50% is involved. Adenocarcinoma in situ (nonmucinous type) shows pure GGO on HRCT.[8]

It is a glandular tumor with mucin-producing cells that stain positively for mucin on histology. Compared to those with SCLC, those with NSCLC have a poorer response to chemotherapy. This is the reason why patients with resectable tumors are treated surgically. Despite improved treatments, the five-year survival rate is less than 12% to 15% . A late diagnosis might lead to tumor spread or an unresectable tumor, resulting in a poorer outcome

Case Presentation

A 54-year-old male patient presented with a 2-months history of shortness of breath, a non-productive cough for past 2 months and decreased appetite for one month. He had no history of fever or night sweats but had lost around 5–6 kgs over the preceding 2 months . About 18 years back, he had history of anti tubercular treatment for 15months which was diagnosed clinic-radiologically. He had no history of close TB contact or similar illness in family. A nonsmoker with no significant past medical and surgical history. For these complaints he consulted local physician and he was started on antitubercular treatment (with rifampicin , isoniazid , ethambutol , pyrazinamide in combination on optimal weight based dosing) clinico-radiological basis before being treated with oral Amoxycillin plus clavulanate for 1 week and oral Azithromycin for 5 days, without much relief. Patient had tachypnea with other vital signs included heart rate of 112/min, blood pressure of 148/84 mmHg in supine position in left arm ,room air saturation of 80 % and decreased air entry with harsh vesicular breath sounds and occasional fine mid-inspiratory crepts,particularly in basal areas on auscultation. Laboratory examination revealed a hemoglobin level of 14.9 g/dL (reference range 13.0–17.0) and a total leukocyte count of 9,230/mm3 (reference range 4.0–11.0), but normal differential counts. Slight derangement in liver and renal function test .The C-reactive protein level was 25 mg/L (reference range 0–5).

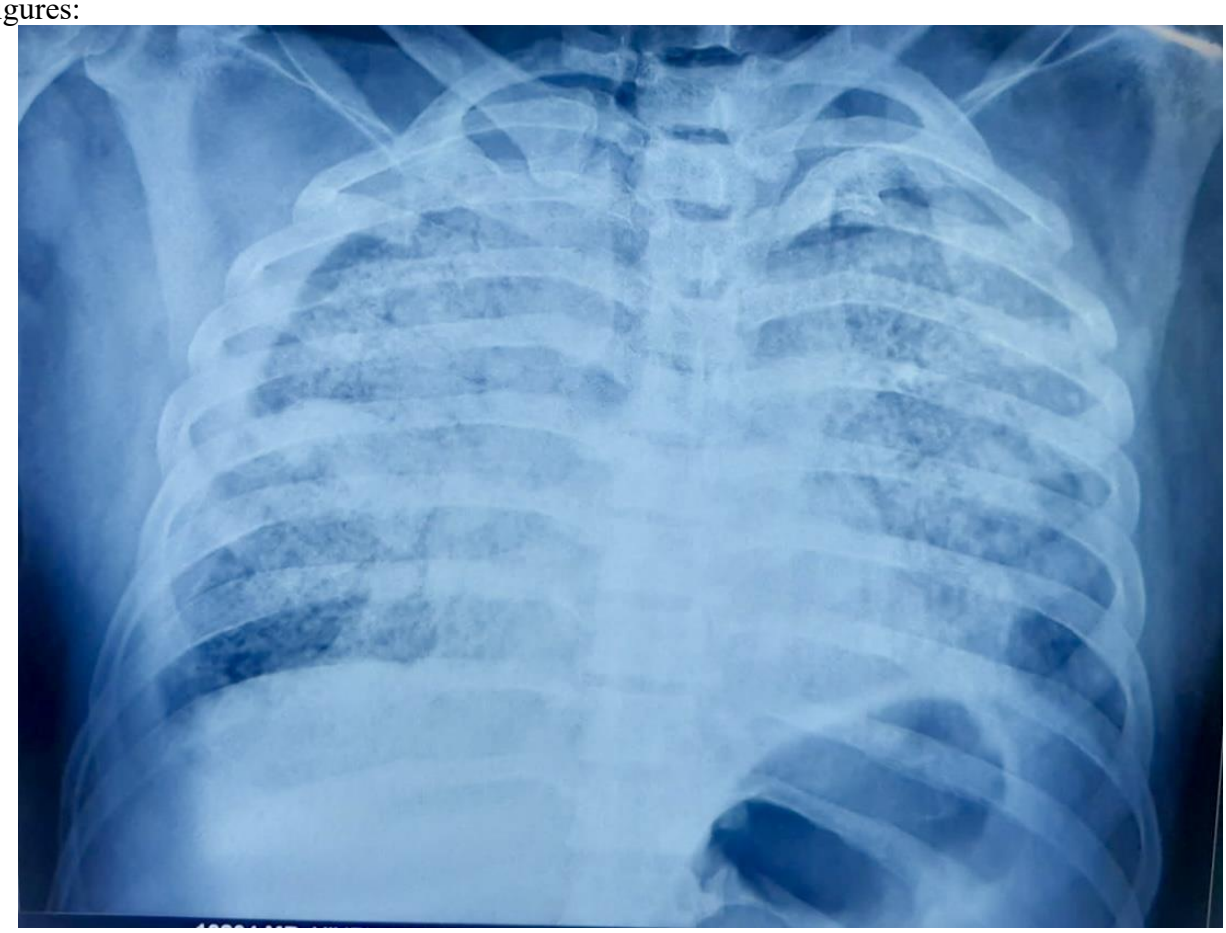
X-ray chest PA view image was taken and findings were suggestive of bilateral non-homogenous opacity with pachy areas of consolidation bilaterally.

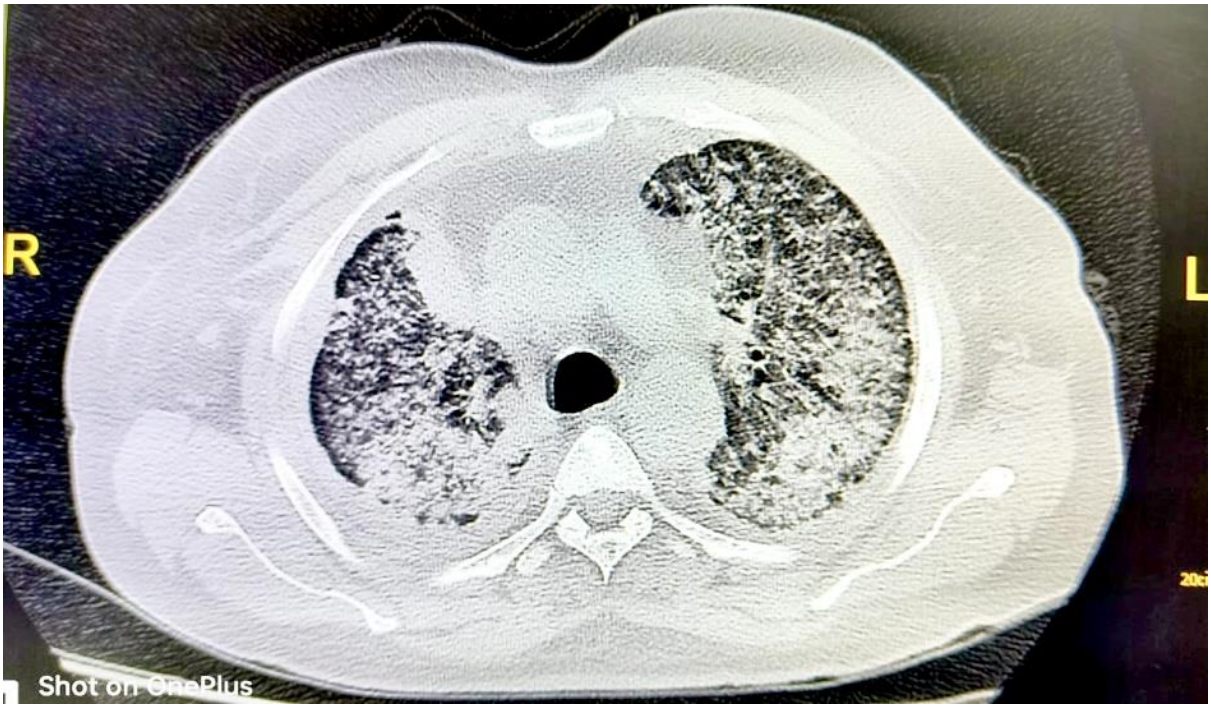
The following tests done to narrow down the differential diagnoses were all negative: sputum acid-fast bacilli smear (two samples), tuberculin skin test, human immunodeficiency virus antibody test, and autoimmune profile all being negative. Right sided pleural tapping as done ,which was an exudative, lymphocytic dominant pleural effusion with low ADA. Effusion was negative for gene Xpert and malignant cells ,and did not grow any organism.

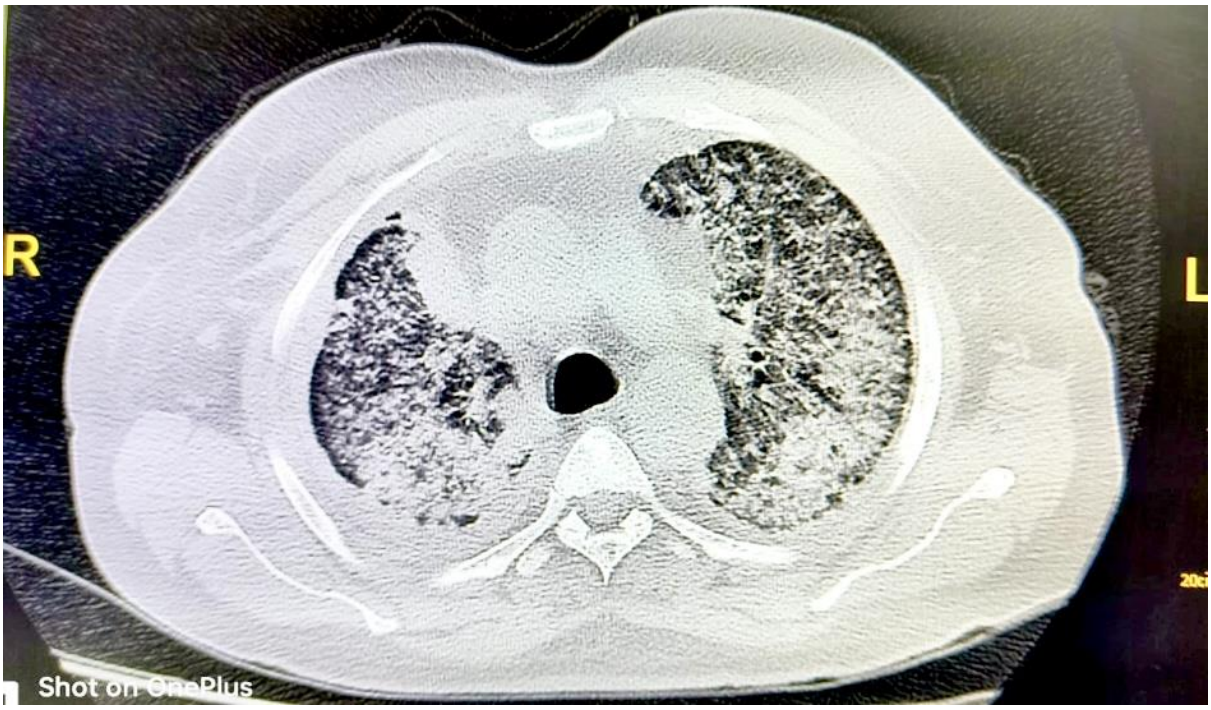
A HRCT scan of the chest confirmed diffuse areas of ground glass attenuation in bilateral lung fields which were symmetrical , diffuse parenchymal architectural distortion with airspace consolidation .

Fiberoptic flexible video bronchoscopy was performed, which showed unremarkable cords, trachea, and carina and left lung. The right side of the lung showed extraluminal compression at apical segment of right upper lobe and right middle lobe. Multiple transbronchial cryobiopsy was taken from lateral segment of right middle lobe and latero basal segment of right lower lobe. The bronchioalveolar lavage was negative for malignant cells,and histopathology findings were suggestive of non small cell lung carcinoma. Immunohistochemistry (IHC) report revealed TTFI: nuclear staining(+++), CK7 : Cytoplasmic staining (+++), p40 Negative, Calretinin : Negative, so the findings suggestive of adenocarcinoma lung .

Figures:



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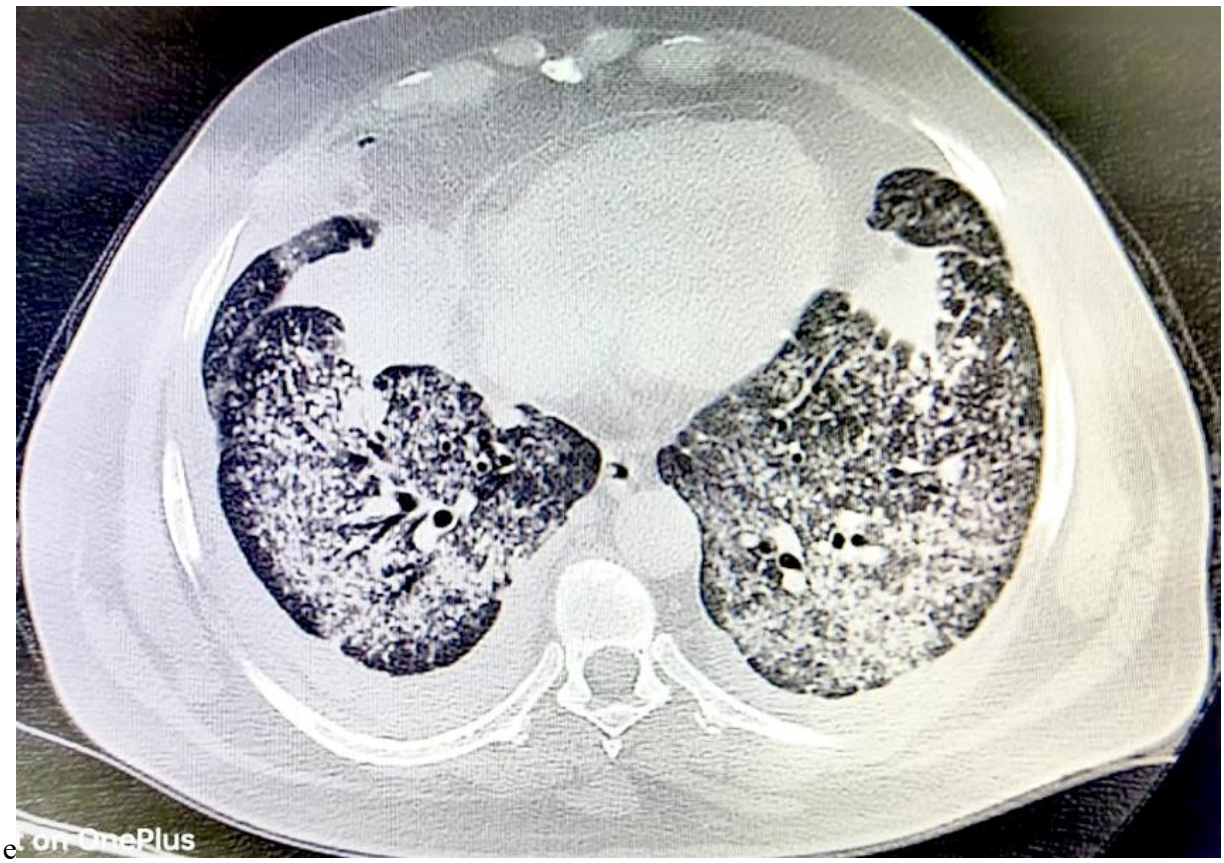
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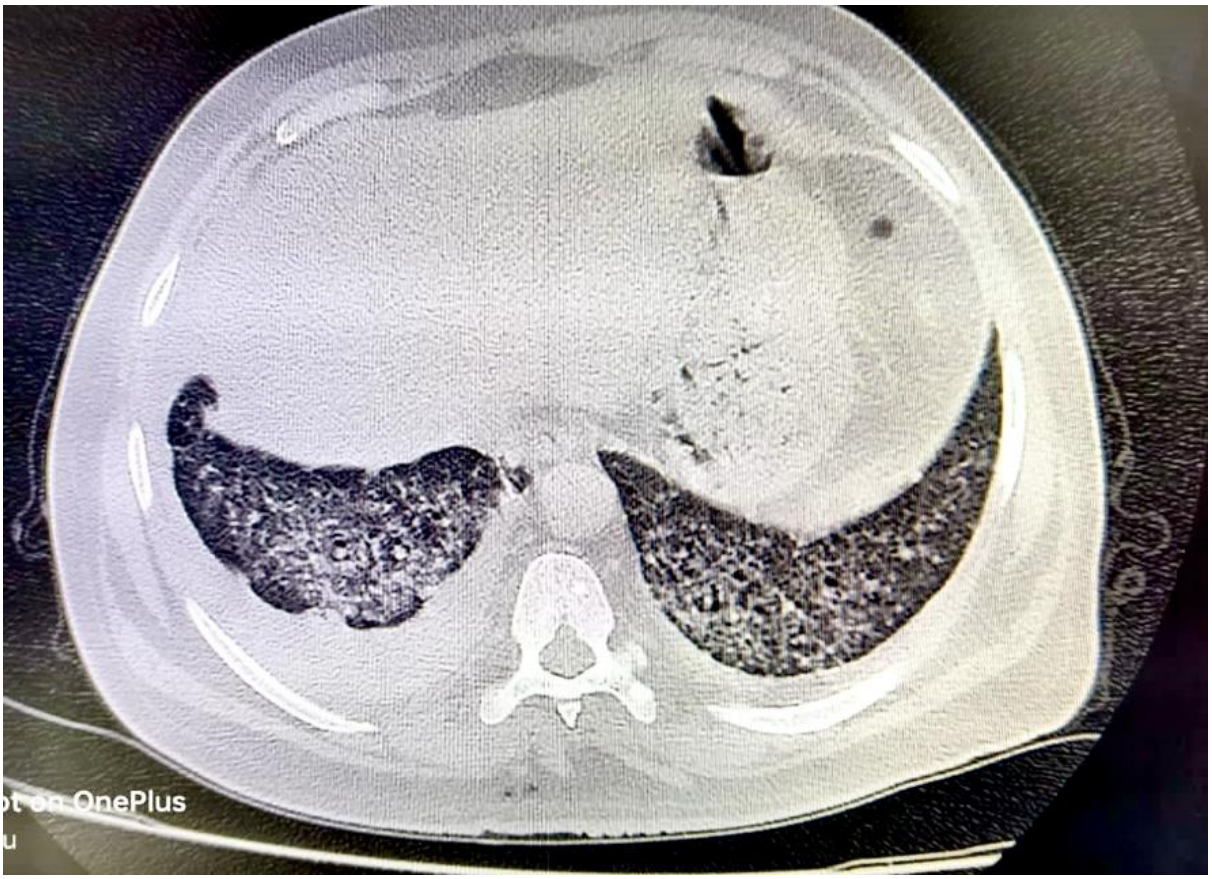

Test Name	Result	Unit	Biological Ref. Range
Histopathology			
IHC MARKER (FULL)			

Remarks :-

SPECIMEN: Cryobiopsy

GROSS: Specimen consists of multiple brown soft tissue pieces altogether measuring 0.5 cm. Whole tissue embedded.

MICROSCOPY: Serial sections studied show fibrocollagenous stroma dysplaying a malignant tumor composed of pleomorphic cells arranged in papillae, small nests and scattered singles. Individual cells are round to oval, have high nuclear cytoplasmic ratio, abundant eosinophilic cytoplasm, irregular nuclear membrane, vesicular nuclei and prominent nucleoli in most of them. Few of the cells show intranuclear pseudoinclusions. These cells are infiltrating the adjacent alveoli. There is mild to moderate inflammatory cell infiltrate comprising of lymphocytes, plasma cells, few neutrophils and macrophages.

IMPRESSION: Findings are suggestive of Non Small Cell Lung Carcinoma

IMMUNOHISTOCHEMISTRY REPORT

1) TTF1: Nuclear staining (+++)
2) CK7: Cytoplasmic staining (+++)
3) p40: Negative
4) Calretinin: Negative

In view of the above, IHC findings are suggestive of Lung Adenocarcinoma

* * End of Report * *

Discussion

Amongst all lung cancers, 85% are non-small cell types, including adenocarcinomas, squamous cell carcinomas, and giant cell undifferentiated carcinomas . Adenocarcinoma is the most prevalent type

of lung cancer.[12348] Like all other lung cancers, it is related to tobacco use, but it is also the most frequently diagnosed lung cancer in nonsmokers, particularly women. It often grows more slowly than other lung tumors, although it can also spread in its early stages. Detterbeck et al. described pneumonic-type lung adenocarcinoma (P-ADC) as adenocarcinoma with pneumonia-like infiltration or consolidations involving regions in the lungs.[8] It is characterized by ground-glass opacity or consolidation on a chest CT that resembles infectious or inflammatory lung disease. It can present with dyspnea, cough, and fever. Because of this, this type of lung adenocarcinoma is often misdiagnosed, especially since many people with this condition are nonsmokers. It is only after investigating the cause of non-resolving pneumonia that the diagnosis is made.

Short history of flu-like symptoms and non-productive cough in a young patient without any previous illness and the pattern of bilateral reticular opacities on the chest imaging led to a diagnosis of interstitial lung involvement. Interstitial lung diseases constitute a heterogeneous group of inflammatory and fibrotic lung disorders with a variety of risk factors. This pattern of involvement is not typical of lung cancer; however, lepidic adenocarcinoma presents with invasion into vessels, pleura, or lymphatics.[6] The spread of tumour cells to the pulmonary lymphatic system or the adjacent interstitium causes thickening of the bronchovascular bundles and septae leading to diffuse interstitial opacities. Some tumours might present with detached tumour cells within intra-alveolar spaces, resulting in airspace filling. These cells can have a bland cytological appearance mimicking desquamative interstitial pneumonia on histopathology[3,4,5,6]. The pattern can also be purely due to lymphangitis carcinomatosis, the CT features of which include smooth or nodular thickening of interlobular septa and peribronchovascular interstitium and ground glass appearance.The imaging method of choice is a chest CT scan. CT images of peripheral consolidative pneumonia with surrounding nodules favor pneumonic-type adenocarcinoma instead of pneumonia. CT findings of an air-filled bronchus with stretching, squeezing, and enlargement of the branching angle or bulging interlobar fissures suggest pneumonic-type bronchioloalveolar carcinoma (BAC) rather than bacterial pneumonia [8]. It usually occurs in the lung periphery and, in many cases, may be found in scars or areas of chronic inflammation. The final diagnosis is given by histopathological evaluation of the biopsy sample, which can be acquired by bronchoscopy or transthoracic surgery. Patients with no symptoms and a mass lesion on the chest radiograph had a better prognosis than those with symptoms and infiltrative signs on the chest radiograph.

Above presentation was also a mimic to Acute interstitial pneumonia (AIP) which is an idiopathic lung disease characterised by rapidly progressive dyspnoea developing over days to weeks which leads to rapidly progressive respiratory failure occurring in patients without pre-existing lung disease or extrathoracic disorders known to be associated with lung involvement . The outcome is often fatal . The chest radiographic and high-resolution computed tomography (HRCT) scan manifestations of AIP are bilateral and sometimes patchy, and there are alveolar densities associated to areas of ground glass attenuation . Adenocarcinoma is the most common type of lung cancer among nonsmokers and women . The presentation of adenocarcinoma of the lung as diffuse areas of ground glass attenuation in bilateral lung fields with air space consolidation is rare, but it has a poor prognosis if its diagnosis is delayed.

Conclusions

Lung cancer is the most common cancer diagnosis worldwide,with a high rate of mortality. Lung adenocarcinoma,a non-small-cell lung cancer is the most common histological subtype with nonspecific symptoms and outcomes.

Early diagnosis and treatment are critical in patients' outcomes and survival.

Clinical and radiological presentations can be a mimic to pneumonia,ARDS,various forms of Interstitial lung diseases ,eosinophilic lung diseases.It is prudent to look for carcinoma lung by doing histopathological examinations in patients presenting with non-resolving pneumonias of varied presentations.

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