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A RARE CASE REPORT OF LIPOID PNEUMONIA: THE LEAD FROM RADIOLOGIST WITH ROLE OF HRCT

Radiodiagnosis

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ABSTRACT

Lipoid pneumonia is a rare disorder with incidence of 1-2.5 % [2], wherein the interstitial and alveolar compartments are filled with lipid components. Endogenous and exogenous types of lipoid pneumonias are the two major types. Here 26 years male presented with cough and dyspnea for past two weeks with a history of accidental petrol ingestion 2 weeks back was diagnosed to have findings of exogenous lipoid pneumonia on HRCT and further presented with foamy lipid rich macrophages on BAL.

KEYWORDS

Lipoid pneumonia, HRCT, Nodule with fat attenuation, petrol ingestion, vegetable oil, , BAL, Fat laden macrophage

INTRODUCTION

Lipoid pneumonia is defined as the filling of the interstitial and alveolar compartments with lipid components which are engulfed by the intra-alveolar macrophages. Commonly diagnosed after ingestion of vegetable oil and mineral oil. It has to be differentiated from bacterial pneumonia, lung tumor, tuberculosis, organizing pneumonia. Endogenous and exogenous types of lipoid pneumonias are the two major types. We are presenting a case of exogenous lipoid pneumonia who presented with symptoms of cough and dyspnea progressing for past two weeks.

CASE REPORT

A 26 year old male presented with cough and dyspnea for past two weeks with a history of accidental petrol ingestion 2 weeks back has been referred to our department. Previously the patient was not treated for any co morbidities. Cough with purulent mucus and scanty blood stained sputum and dyspnea are the symptoms with which the patient was admitted. However the patient maintained good saturation of 98%. Physical examination was performed and bilateral lower fields found to have reduced breath sounds and velcro crackles. Leukocytosis with neutrophilia revealed in blood investigations. Prominent right hilum with ill defined opacity in right lower zone and overlying the right cardiophrenic angle and similar ill defined opacity obscuring the left costophrenic angle were the CXR findings [FIG: 1]. Further we proceeded with HRCT since CXR was inconclusive. Plain HRCT study of thorax was done which was doubtful for a malignant pulmonary lesion. So we proceeded with contrast study and which revealed irrugular mass-like consolidative opacity noted in right middle lobe with fat attenuation (-32 to -10 HU) noted within the mass measuring ~ 7 x 3.1 x 3.6 cm (AP x TR x CC) with peripheral enhancement with mild architectural distortion noted in right middle lobe occupying both medial and lateral segments [FIG: 2,3]. Mild adjacent ground glassing with interlobular septal thickening (crazy paving) noted. There is evidence of small fat attenuation foci blocking the medial segmental bronchi of right middle lobe just adjacent after the bifurcation. Few nodules noted in right middle lobe lateral segment with fat attenuation measuring 11 x 13 mm and medial segment subpleurally measuring 6 x 9 mm and in right lower lobe anterior segment measuring 12 x 9 mm, medial basal segment (x2) with spiculated margins. Similar finding noted in left lung lower lobe with mass-like consolidative opacity associated with mild adjacent ground glassing measuring 20 x 9 mm in left lower lobe lateral basal segment. Nodule with fat attenuation and mild spiculated border noted adjacent to this mass in lateral basal segment measuring 8 x 10 mm. There is evidence of pleural thickening with adjacent fibrotic changes noted in left lower lobe lateral region. A diagnosis highly suspecting lipoid pneumonia was made. We the radiologists advised for evaluation with BAL with specific staining. Bronchoscopy was done and aspiration of secretions sent for cytological and microbiological examination and broncho-alveolar lavage fluid sent for immunological study. No evidence of any microorganisms / malignant cells. BAL showed fat laden macrophages which hence confirms the HRCT findings [FIG: 4]. The patient was given treatment with oxygen therapy, antibiotics (piperacillin / tazobactum) and prednisolone.

FIG: 1

PA CXR : Prominent right hilum with ill defined opacity in right lower zone and overlying the right cardiophrenic angle and similar ill defined opacity obscuring the left costophrenic angle

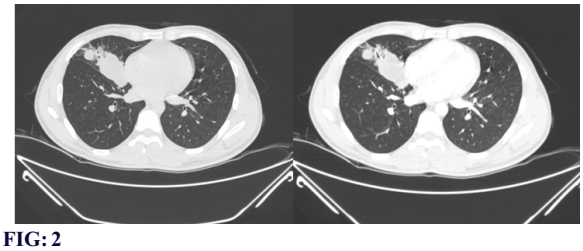

FIG: 2

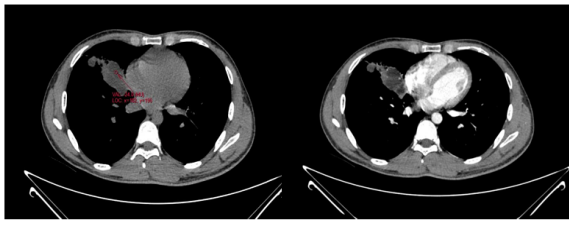

FIG: 3

Irregular mass-like consolidative opacity in right middle lobe with fat attenuation (-32 to -10 HU) within the mass with peripheral enhancement with mild architectural distortion and mild adjacent ground glassing with interlobular septal thickening (crazy paving)

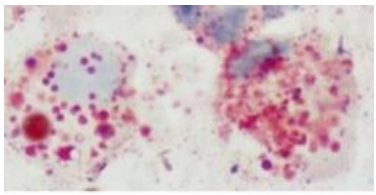

FIG: 4

The cytoplasm of the alveolar macrophages is full of red-staining cytoplasmic vacuoles filled with lipid that displace the nucleus to the periphery (oil red O stain)

DISCUSSION

Exogenous lipoid pneumonia is a rare pulmonary disorder which presents with cough and dyspnea due to inhalation of mineral oil [1]. Laughlen was the first person to describe this condition in 1925 for use of nasal medications containing petroleum for the treatment of tuberculosis [5, 6]. Cholesterol or golden pneumonia is the endogenous form wherein destruction of alveolar cell wall and tissue repair during a suppurative process produces cholesterol and its esters thus producing lipoid pneumonias [7]. Organizing pneumonia, malignancies, sarcoidosis, fat embolism, Gaucher and Niemann Pick disease are the common associations with endogenous lipoid pneumonia [8]. Inhalation or exposure to oil, egg yolk, use of petroleum jelly (Vaseline, Vicks TM) and lip balm leads to exogenous lipoid pneumonia [9]. Chronic foreign body reaction to fat which is characterized by lipid-laden macrophages leads to lipoid pneumonia [1]. A nodule or mass is formed due to coalescence of intra-alveolar oils in the alveoli which are encapsulated by fibrous tissue. Lung lipases hydrolyses animal fats to free fatty acids which in turn trigger severe inflammatory reaction and leads to focal edema and intra-alveolar hemorrhage [1]. Macrophages phagocyte these hydrolysed fatty acids which migrate to the interlobular septa causing crazy paving pattern. Chronic cough and dyspnea are the most common symptoms [1]. However less commonly can present with chest pain, hemoptysis, weight loss, fever, abdominal pain, dysphagia, vomiting. On PFT these patients can have restrictive, obstructive or mixed pattern [11]. There is need of clinical history, clinical examination, radiological and BAL for coming to a diagnosis of lipoid pneumonia. CXR is always nonspecific. Diffuse consolidations and nodular opacities predominant lower and middle lobe distribution are the common CXR findings [12]. Airspace consolidations, ground glass opacities, crazy paving pattern, interlobular septal thickening are the common HRCT findings [13]. Negative density value (-30 / -150 HU) consolidations are highly suggestive of fat density. Suitable sampling with ROI (region of interest) positioned within consolidation is needed in a proper HRCT to avoid sampling liquid or air [14]. Lipid laden macrophages identified in broncho-alveolar lavage is the marker which confirms the diagnosis strongly suspected on HRCT [1]. Foamy macrophages with large cytoplasmic vacuoles are significant findings in exogenous form [16]. In conclusion, lipoid pneumonia is a rare condition which is often under diagnosed. Diagnosis should be made on the basis of a careful history, radiological features and cytology. Lipoid pneumonia should be differentiated from other mimics with the help of radiologists, pathologists and multi disciplinary approach.

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