Eur Respir J
1991, 4, 125–127

Unilateral lung infiltrate

K.K. Guntupalli, P. Bailey Francis

Case history

A 68 yr old white male was referred because of an abnormal chest roentgenogram. Past history was significant for a right carotid endarterectomy and a stroke several years earlier that left him hemiparetic on the right side. He was unable to ambulate actively since his cerebrovascular accident. The patient admitted to difficulty in swallowing since the stroke. He also complained of shortness of breath and cough. He slept only on the right side since the stroke.

Physical examination revealed no respiratory distress, but decreased breath sounds were noted on the right side. Chest roentgenogram (fig. 1) revealed diffuse alveolar and interstitial infiltrates on the right side. Right lung volume was reduced. Chest roentgenogram, taken after the stroke, revealed infiltrates in the right mid-lung field. However, they were much less extensive than on the current film. Fibreoptic bronchoscopy with bronchoalveolar lavage and transbronchial lung biopsy were performed. The biopsy is shown in figure 2.

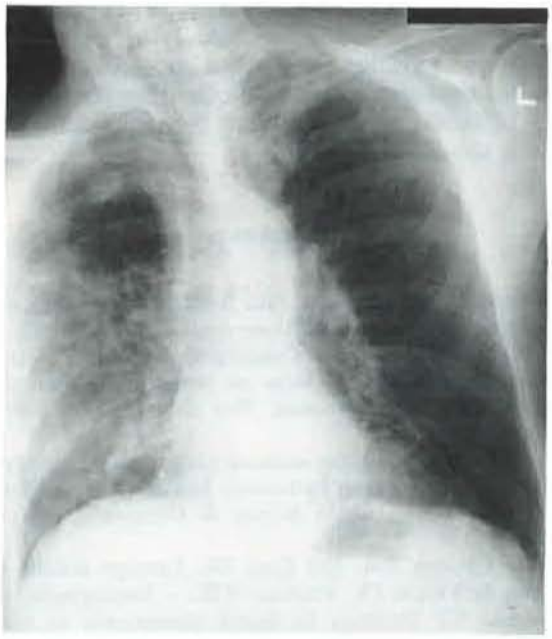

Fig. 1. – PA chest roentgenogram showing diffuse right lung infiltrate. Left lung is clear. PA: posteroanterior.

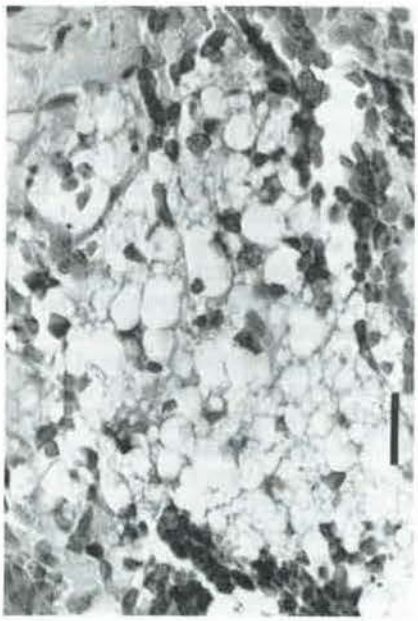

Fig. 2. – Transbronchial lung biopsy showing lipid-laden alveolar macrophages. Bar = 18.3 μm. Haematoxylin-eosin.

Turn to the next page for interpretation of biopsy and for diagnosis.

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Interpretation of biopsy

Mild fibrosis was seen in the pulmonary parenchyma. Lipid laden alveolar macrophages were demonstrated in both the alveolar and insterstitial spaces. Vacuoles in the macrophages stained positive for lipid with Sudan III.

Diagnosis: lipoid pneumonia

Lipoid pneumonia was diagnosed. The patient had been taking mineral oil 2–5 g (1–2 oz) daily for several years against constipation. As a consequence of his stroke he aspirated some of the mineral oil. He was advised to discontinue the use of mineral oil.

Discussion

Lipoid pneumonias occur when exogenous or endogenous sources of lipoid material gain access to the lungs. Exogenous sources include animal, vegetable or mineral oils. Oily nasal drops and sprays may be the offenders. More commonly, it is the result of recurrent aspiration of mineral oil taken for constipation. It is also described in fire-eaters. Other unusual causes include lip gloss, vaseline, baby oil, mentholated petroleum jelly, castor and cod-liver oils [1–3].

Pathologically, lipoid pneumonia represents a foreign body reaction to the oily material. The oil may inhibit ciliary clearance. Mineral oil behaves chemically as an inert substance and is not metabolized, unlike animal fat which, when ingested, is hydrolysed to free fatty acids that cause intense inflammation. In the absence of metabolism, foreign body reaction occurs. The vacuoles in alveolar macrophages appear empty on haematoxylin-eosin staining. Sudan III stains the fat specifically. The lipid laden macrophages are seen in alveoli and interstitium. Alveolar and interstitital reaction may ultimately lead to fibrosis.

Clinical presentation varies from totally asymptomatic incidental radiological finding to acute respiratory failure. Fatalities have been reported in children being treated for intestinal obstruction presumed to be due to Ascaris infestation. In these cases, one to two ounces of mineral oil was delivered *via* nasogastric tube every two hours [4]; the fatalities were probably due to the large volume of aspirate rather than to reaction to the mineral oil itself. Acute and fatal cases have also been described in children given oil baths, at which time oil is put in the nose and mouth according to the local custom in Southern India [5].

More commonly lipoid pneumonia is asymptomatic and is recognized when lower lobe infiltrates are seen in a patient with a compatible history of mineral oil usage for a long period. Predisposing causes to aspiration, such as oesophageal or neuromuscular disease, may or may not be present. On chest roentgenogram, an alveolar filling process with consolidation or interstitial infiltration may be seen [1, 6–7]. Occasionally, nodules or masses, including cavitation, may be seen [8].

Differential diagnosis consists of other predominantly basal chronic alveloar filling processes such as alveolar proteinosis, eosinophilic pneumonia, haemosiderosis and bronchoalveolar carcinoma. Because of the unilateral nature of the infiltrate in the patient presented, among the above diseases, bronchoalveolar carcinoma should be strongly considered and excluded by cytological and biopsy examination. Chronic interstitial infiltrates also need to be differentiated from eosinophilic granuloma, sarcoidosis and idiopathic pulmonary fibrosis. Diagnosis is confirmed by the demonstration of lipid laden macrophages in the sputum, alveolar lavage or lung biopsy [9]. In a report by KENNEDY *et al.*[10] diagnosis was only established retrospectively after lobectomy in six out of eleven cases [10]. Thus, diagnosis by more invasive means, such as open lung biopsy, may be required to rule out bronchogenic carcinoma, if previous roentgenograms are unavailable or the clinical history is not very helpful.

On computerized tomographic (CT) scan, with water density being zero, fat has a low attenuation coefficient of -120 to -150 Hounsefield units (HU) [11]. Bottled mineral oil was shown to have -130 HU [7]. This was found to be useful in diagnosing a patient presenting with nodular density which was subsequently confirmed to be lipoid pneumonia by needle aspiration [7].

The unique feature of our patient is the presentation as unilateral lung disease from lying on one side making the right lung dependent and prone to aspiration. No treatment is available other than discontinuing the offending agents, and then the radiological clearance is slow.

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ABSTRACT: A case of unilateral lipoid pneumonia, proven by alveolar lavage and transbronchial lung biopsy, is presented. Following a stroke, which resulted in difficulty in swallowing, the patient slept only on his right side, accounting for the unilateral lung infiltrate. He had been taking mineral oil for several years accounting for the lipoid pneumonia.
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Keywords: Aspiration; lipoid pneumonia; unilateral pneumonia.

Infilitrat pulmonaire unilatéral. K.K. Guntupalli, P. Bailey Francis.
RÉSUMÉ: Présentation d'un cas de pneumonie lipidique unilatérale, démonstrée par lavage alvéolaire et biopsie pulmonaire transbronchique. A la suite d'un accident vasculaire cérébral, qui entraîna des difficultés de déglutition, le patient dormait seulement couché sur le côté droit, ce qui est responsable de l'infiltrat unilatéral. Il avait pris pendant de nombreuses années de l'huile minérale, ce qui rend-compte de la pneumonie lipidque.
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