

Lipoid Pneumonia After Prolonged Inhalation of Clarified Butter Made from the Milk of a Buffalo or Cow (*Ghee*)

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Abstract

Lipoid pneumonia is a rare form of pneumonia caused by inhalation or aspiration of fat containing substances. It can present acutely or more commonly presents as an insidious onset chronic respiratory illness. It requires a high degree of suspicion with great emphasis on history. It can mimic tuberculosis, malignancy or interstitial lung disease. We report the case of a 31-year-old male with a history of sniffing hydrogenated oil, presenting with a non-resolving pneumonia. [Indian J Chest Dis Allied Sci 2016;58:191-193]

Key words: Lipoid pneumonia, Non-resolving pneumonia.

Introduction

Lipoid pneumonia is an uncommon form of pneumonia and has been reported in various age groups in different clinical settings.¹ The absence of specific clinical and radiological features makes diagnosis difficult unless there is a strong suspicion and a specific history of aspiration is obtained. Definitive diagnosis is confirmed by the demonstration of intra-alveolar lipid and lipid-laden macrophages on histopathology. Management strategies might include whole lung lavage, systemic corticosteroids, and thoracoscopy with surgical debridement.

Case Report

A 31-year-old male presented with a six-month history of low-grade intermittent fever, cough with scanty mucoid expectoration and generalised weakness. He had no history of weight loss, chest pain, wheezing or shortness of breath. Sputum smear examination did not reveal acid-fast bacilli (AFB) on multiple occasions. Two months after onset of symptoms, a chest radiograph and computed tomography (CT) were done and he underwent a CT-guided lung biopsy which showed non-necrotising granulomatous inflammation with an engulfed foreign body. He was diagnosed to have sarcoidosis and was treated with oral prednisolone 40mg per day for a month elsewhere without any symptomatic relief. Then he underwent fiberoptic bronchoscopy (FOB). Although his bronchoalveolar lavage (BAL) did not reveal AFB and was negative for malignancy, he was started on first-line anti-tuberculosis treatment as per body-weight. Radiological worsening was noted at the end of two months with

no symptomatic relief. At this stage he presented to us. He was a resident of Mumbai, engineer by profession and a life-long non-smoker. He had no comorbidities, past history of tuberculosis (TB) or contact with a case of TB. He gave no history of travel. On examination, his vital signs were normal. He had no pallor, palpable lymphadenopathy, rash, clubbing or pedal oedema. On auscultation, there were decreased breath sounds in right inter-scapular and infra-scapular area along with inspiratory crepitations. His connective tissue markers including anti-nuclear antibody, anti-neutrophil cytoplasmic antibody, rheumatoid factor, anti double-stranded deoxy ribonucleic acid antibodies were negative. The chest radiograph showed a right mid-zone and lower zone opacification (Figure 1). CT of the chest showed

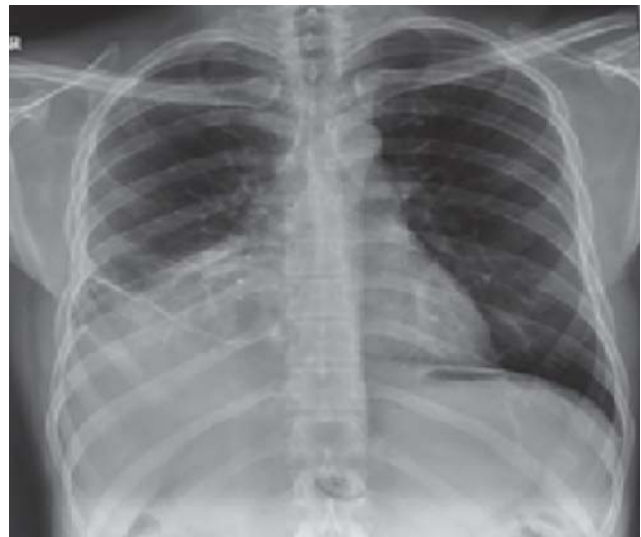


Figure 1. Chest radiograph (postero-anterior view) showing consolidation in the right lower zone.

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a dense right middle and lower lobe consolidation with no mediastinal lymphadenopathy (Figure 2).

On enquiry, he gave history of sniffing around 30mL of hydrogenated oil, commonly known as *ghee* (clarified butter made from the milk of a buffalo or cow) which contains approximately 27g of total fat and 19g of saturated fat) in each nostril every night prior to onset of his symptoms for one and a half years. He did this as part of an *Ayurvedic* practice called *Nasya* where various substances (*ghee*, oil, milk) are sniffed up the nose for clearing nasal congestion and improving memory. The patient underwent a video-assisted thoracic surgery (VATS) biopsy of the right lower lobe lesion. Histopathological examination revealed fat spaces surrounded by foreign body granulomas with interstitial inflammation consistent with lipoid pneumonia (Figure 3).



Figure 2. Computed tomography of the thorax showing right lower lobe consolidation.

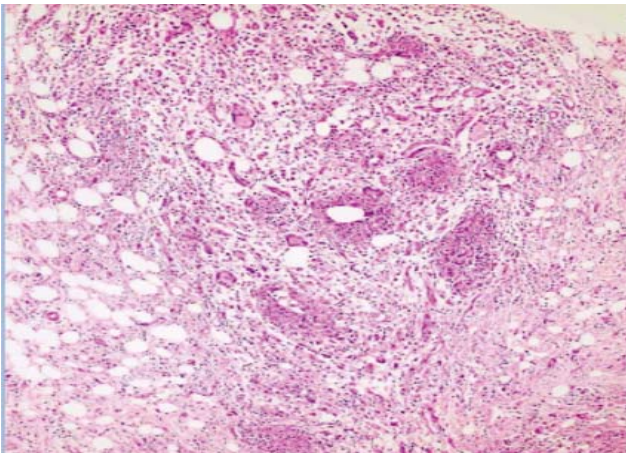


Figure 3. Photomicrograph of the VATS biopsy specimen showing several granulomas with foamy histiocytes and giant cells. Few of the giant cells show fatty vacuoles (Haematoxylin and Eosin; $\times 400$). VATS=Video-assisted thoracic surgery

Corticosteroids administered earlier did not have any improvement in his symptoms. He was subjected to a right middle and lower lobectomy and was advised to stop sniffing hydrogenated oil. The patient improved symptomatically; fever and cough subsided. He was able to carry out his regular activities. A follow-up chest radiograph at one year post-lobectomy showed marked improvement (Figure 4).



Figure 4. Chest radiograph (postero-anterior view) obtained one year after lobectomy showing marked improvement.

Discussion

Lipoid pneumonia is an uncommon condition that results from the pulmonary accumulation of fat-like compounds of animal, vegetable or mineral origin.^{1,2} It was originally described in 1925 by Laughlen on autopsy specimens and has been rarely reported since then.³ It can be classified into exogenous or endogenous form. Exogenous form is more common, occurs due to aspiration of fatty substances and can be acute or chronic depending on time of exposure and development of symptoms. Endogenous form also called 'cholesterol' or 'golden' pneumonia is rare, secondary to bronchial obstruction or following chronic infections or due to errors of lipid metabolism.⁴

Lipoid pneumonia is commonly seen in children who are treated with mineral oils for common cold and constipation.⁵ There are reports of lipoid pneumonia associated with aspirating or inhaling mineral oil (as seen in our patient), oil-based laxatives, lip balm, lip glow.^{6,7} In our country siphoning of various mineral oils (like, diesel) from containers is a common practice and may be an important risk factor for lipoid pneumonia. Other risk factors are occupational exposure in fire eaters,⁸ anatomic or structural abnormality of the pharynx and oesophagus, such as, Zenker diverticulum, gastro-oesophageal fistula, hiatal hernia, gastro-oesophageal

reflux, achalasia; psychiatric disorders; episodes of loss of consciousness; neuro-muscular disorders that result in swallowing dysfunction or affect the cough reflex; and Chagas disease characterised by constipation due to functional disorder of colon, and tendency to aspiration due to mega-oesophagus.⁹

The distinctive feature in our case was the prolonged exposure of the patient to hydrogenated oil. He sniffed approximately 30mL of hydrogenated oil (*ghee*) as part of *Ayurvedic* treatment for “nasal clearing” every night for one and a half years before onset of his symptoms. Aspiration of mineral oil is usually silent, non-irritating, does not elicit a cough reflex and impairs mucociliary clearance. Pathologically, foamy vacuolated material may be seen in the alveoli, sometimes localised chronic granulomatous and fibrotic process is set up, so called paraffin granulomas, mimicking lung neoplasm.¹⁰

The clinical symptoms are non-specific, and vary according to the patient's age, duration of oil intake, and the amount and quality of oil aspirated. Clinical presentation is diverse and can be insidious onset shortness of breath, fever, weight loss which follows chronic, recurrent, low dose exposure to the inciting agent or an acute presentation with severe respiratory distress following a massive exposure.⁴ The middle and lower lobe are postulated to be the most common sites for lipid pneumonia owing to leaning forward position while sniffing oil.

Diagnosis is based on clinical history of exposure to oil consumption. High resolution CT may show alveolar consolidation, airspace nodules, ground-glass opacification. Rarely, crazy paving pattern, lung mass (paraffinomas) and pneumatoceles may be seen. The most consistent finding is low density consolidation (–30 to –150 HU) as seen in our patient.¹¹ The definitive diagnosis is made by demonstrating lipid laden macrophages in BAL fluid and in the alveoli or interstitium in bronchoscopic lung biopsy.²

There are currently no studies in the literature that define the best therapeutic option. However, identifying and discontinuing the offending agent is the key measure.¹¹ Role of corticosteroids is controversial with experience being limited to case reports with variable results.^{12,13} In a series of 10 children with lipid pneumonia, repeated multiple therapeutic whole lung lavage resulted in significant improvement.¹⁴ Use of fat emulsifiers like 0.05% polysorbate 80 in Ringer's lactate for lung lavage has also been reported.¹⁵ The natural history and outcome of lipid pneumonia are variable, and depend on the type, volume, and distribution of oil aspirated. The best treatment for this disease is prevention. It is suggested that changes in the licensing of mineral oil for internal use may contribute significantly to the primary prevention of lipid pneumonia.^{16,17}

Our case highlights the importance of careful and meticulous history taking. History of fatty compound aspiration, which may be acute or chronic, forms the cornerstone of diagnosis. This history should be sought in individuals presenting with a chronic non-resolving pneumonia.

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3. The diagnosis in each case has been confirmed; and
4. The chest radiograph is accompanied by brief clinical account, not exceeding two page typescript (with sub-head: Clinical Summary, Investigations, Diagnosis, Discussion and References)

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