

## Exogenous Lipoid Pneumonia Complicated with Mycobacterium Infection in a Subject with Zenker Diverticulum

Dear Editor,

Exogenous lipoid pneumonia (ELP) is the result of a foreign body-type reaction to the presence of lipid material within the lung parenchyma. It is caused by inhalation or aspiration of oil-based substances, such as mineral, vegetable and animal oil.<sup>1</sup> Mineral oils are either temporally absorbed by alveolar macrophages, to be released again when the phagocytes die or they remain free within the alveoli, leading to the formation of giant cells and fibrosis around large mass oils, several months after they reach the lung parenchyma.<sup>2</sup> We report a case of ELP complicated by mycobacterium tuberculosis infection in an elderly male patient with an oesophageal disorder and chronic digestion of paraffin oil.

An 86-year-old man was referred to our clinic from another medical centre with a history of weight loss and a 20-day history of dry cough and night fever of up to 38.0°C, which had not responded to a 15-day treatment with clarithromycin and amoxicillin-clavulanic acid. On admission, the patient had mild anaemia and an elevated erythrocyte sedimentation rate, while the rest of the laboratory tests were normal and sputum Ziehl-Neelsen stain was negative. The patient had a history of arterial hypertension, chronic atrial fibrillation, depression and diverticulosis of the colon. A thorax computed tomography (CT) revealed the presence of an irregular peripheral mass in the right inferior lobe, corresponding atelectasis, a small right pleural effusion and mediastinal lymphadenopathy, suggesting possible lung cancer. The patient underwent bronchoscopy to differential diagnose between malignancy and non-malignant conditions, but it was inconclusive. He was discharged from hospital with an anti-tuberculous therapy, because of the development of *Mycobacterium tuberculosis* in bronchoalveolar lavage (BAL) and sputum cultures.

Three months later, a new thorax CT revealed pulmonary infiltration of low density (ranging from -31 to -39 Hounsfield units) in both inferior lobes with interlobular septal thickening, ground glass opacities and “crazy paving” pattern, consistent with lipoid pneumonia. Additionally, right pleural effusion and mediastinum lymph nodes calcifications were noted (Fig. 1). The patient revealed that he had been taking paraffin oil for constipation before going to bed for the last 3 years. The laxative was discontinued.

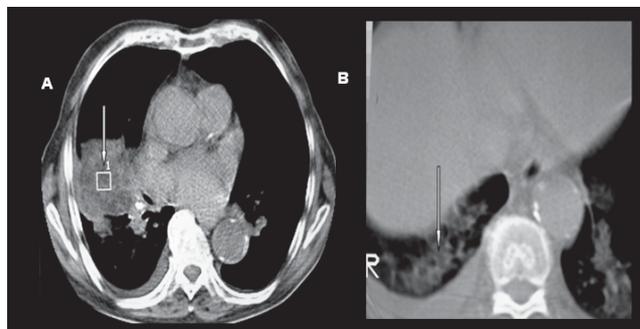


Fig. 1. Thorax CT findings, characteristic of lipoid pneumonia.  
A. Pulmonary infiltration of low density (arrow).  
B. Crazy paving pattern in the right inferior lobe (arrow).

After 2 months, the patient was re-admitted due to a persistent cough and dysphagia. A large right pleural effusion appeared in the chest radiograph and approximately 3 litres of pleural fluid were removed during thoracocentesis. Biochemical analysis of fluid indicated that it was exudate with low glucose concentration. Pleural biopsy, which was conducted to diagnose the aetiology of pleural effusion, revealed the presence of a chronic granulomatous disease consistent with tuberculosis (TB). Moreover, video-fluoroscopic swallow study (VFSS) revealed the presence of a 4 cm in diameter Zenker diverticulum at the left-lateral wall of the esophagus. Liquid, but not solid food, refluxed from the diverticulum and was aspirated.

After the physician's inquiry, the patient admitted that his adherence to the anti-tuberculosis treatment was extremely low. Furthermore, he had been receiving 8 mg of prednisolone once daily, according to the recommendation of another physician. Corticosteroid treatment was gradually terminated. Moreover, the patient was advised to swallow small quantities (up to 5 cc) of liquid or solid food during meals, using a certain technique. A month later, both his clinical symptomatology and chest radiograph had significantly improved.

Thorax CT is considered the imaging technique of choice for the diagnosis of ELP. The typical CT appearance is that of low-density mass-like consolidation with negative Hounsfield units.<sup>3</sup> Another commonly seen pattern is that of ground-glass attenuation with superimposed septal thickening (crazy-paving pattern).<sup>1</sup> Biopsy specimens showing alveoli filled with macrophages that contain lipid vacuoles<sup>2</sup> could confirm the diagnosis of ELP. However, it

has been suggested that for patients with a long history of mineral oil consumption and detection of fat in lung masses by CT, a needle aspiration biopsy or surgery would be needed only if a mass showed signs of growth.<sup>3</sup>

Patients particularly at risk for ELP include those with a high risk of aspiration. Achalasia, gastroesophageal reflux, scleroderma or other swallowing dysfunctions are some of the most common risk factors.<sup>4</sup> Although Zenker diverticulum is also associated with aspiration, to the authors' knowledge, this is the first case of ELP in a patient with this oesophageal disorder.

There is some evidence indicating an association between ELP and super-infection by non-tuberculous mycobacteria. Strains of the *M. fortuitum-chelonaei* and *M. smegmatis* groups are the most common pathogens.<sup>5</sup> The presence of lipids seems to enhance the pathogenicity of mycobacteria with a mechanism that is still poorly understood. Some authors support that a high concentration of free fatty acids would be a factor favouring haemorrhagic necrotising pneumonia with secondary superinfection.<sup>6</sup> In this case, ELP was complicated by *M. tuberculosis* infection. Whether the occurrence of tuberculosis was accidental or free lipid acids enhanced the pathogenicity of typical mycobacteria, remains unclear. However, this is the first report of *M. tuberculosis* infection in a patient with ELP.

In conclusion, a detailed medical history is essential for the diagnosis of ELP. The presence of a disorder that can increase the risk of aspiration, as well as a mycobacterial superinfection should always be taken into consideration among such patients. Discontinuation of the causative agent, mainly paraffin oil, combined with swallowing techniques for those with oesophageal disorders could be effective. However, primary prevention should be stressed;

laxatives should never be ingested prior to sleep, while population at risk of aspiration should be informed about the possible hazards associated with paraffin oil consumption.

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