

CASE FOR DIAGNOSIS

Lung infiltrate in a male with a bronchopleural fistula

C. Raynaud*, B. Crestani*, M. Grossin#, M. Piperaud*, M-C. Dombret*, M. Aubier*

Case report

A 49-yr-old male was admitted to the Pulmonology Unit of Bichat Hospital (Paris, France) in February 2001 due to minor haemoptysis. He had a history of right upper lobe tuberculosis in 1970, complicated with secondary aspergillosis in 1999 and treated with itraconazole between April and October 1999. In November 1999, he presented with right pleural empyema (local samples yielded *Pseudomonas aeruginosa* and *Streptococcus sanguis*) due to a bronchopleural fistula (fig. 1a). Right open thoracostomy was performed in December 1999 and daily local care provided for 14 months until admission. On questioning, he denied experiencing fever, weight loss and shortness of breath.

Physical examination results were normal. The pleural cavity was clean and sterile and the bronchopleural fistula still open. Laboratory results, including white blood cell count and erythrocyte sedimentation rate, were normal.

The chest radiograph is shown in figure 1b.

Computed tomography was also performed (fig. 2).

Fibreoptic bronchoscopy revealed post-tuberculous scarring in the right bronchial tree. Results of bacteriological and mycological studies were negative, as was the search for *Mycobacterium tuberculosis*.

Bronchoalveolar lavage was performed in the left upper lobe. The resultant fluid was whitish and contained 200,000 cells·mL⁻¹: 71% macrophages, 21% lymphocytes, 8% neutrophils, and 1% eosinophils. Oil red O stain results are shown in figure 3.

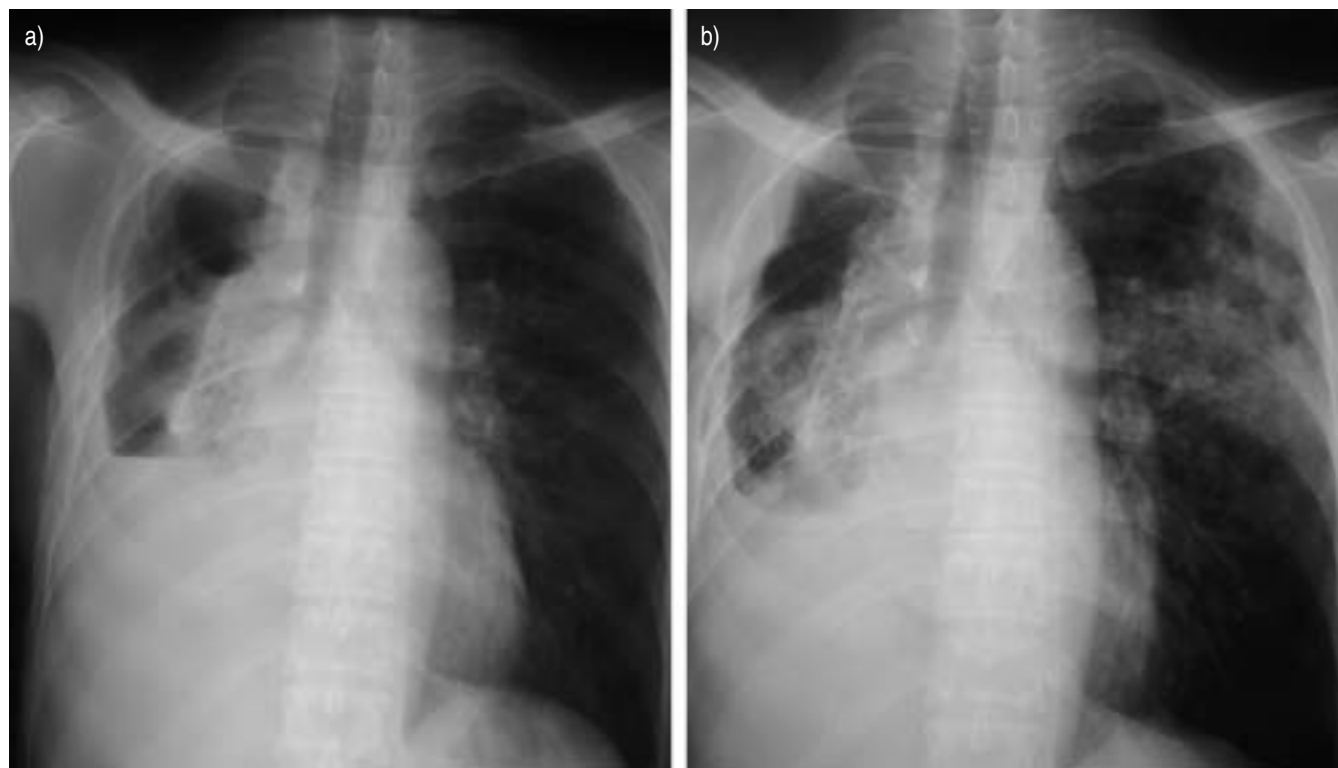


Fig. 1. – Chest radiographs on a) diagnosis of empyema and before thoracostomy (November 1999) and b) admission (January 2001).

*Pulmonology Unit and #Pathology laboratory, Bichat Hospital, Paris, France.

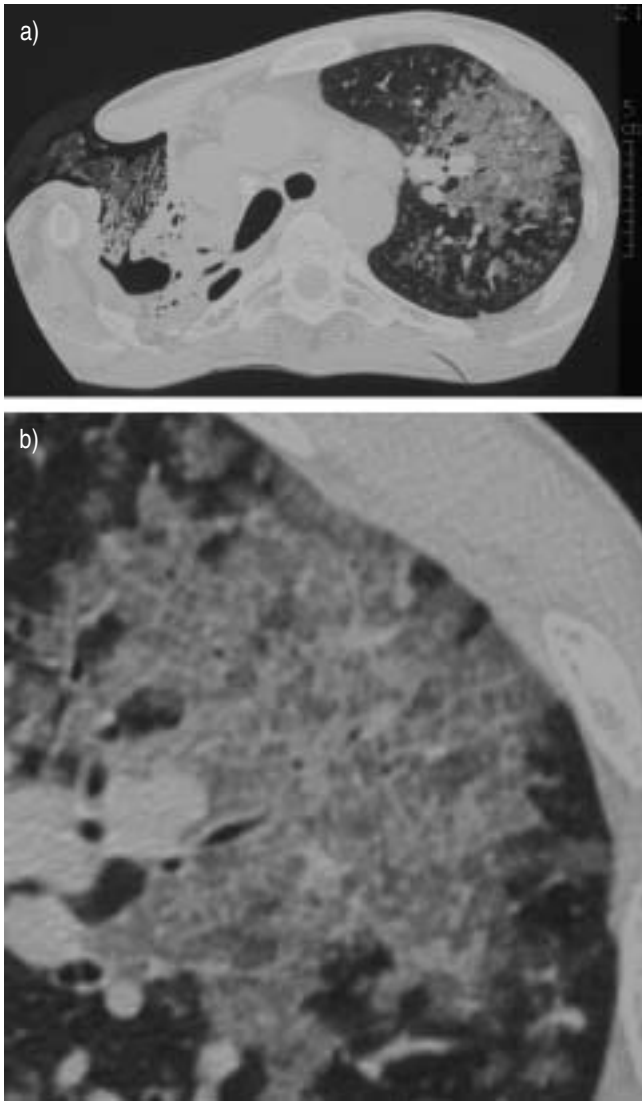


Fig. 2.—Computed tomography of a) the chest and b) the left hemithorax.

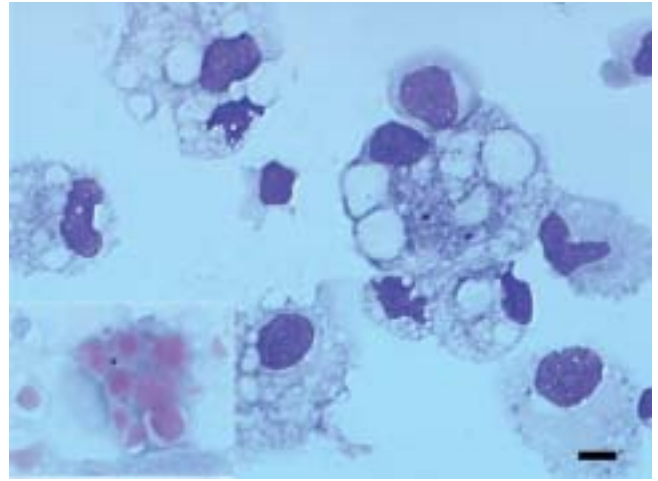


Fig. 3.—Bronchoalveolar lavage fluid. May-Grünwald Giemsa and (inset) oil red O stain; internal scale bar=5 μ m.

BEFORE TURNING THE PAGE, INTERPRET THE CHEST RADIOGRAPH, THE COMPUTED TOMOGRAPHY SCAN AND THE HISTOLOGICAL RESULTS AND SUGGEST A DIAGNOSIS AND TREATMENT.

Interpretation

Chest radiograph

Chest radiography revealed a new left upper lobe infiltrate in addition to the chronic right lung abnormalities (fig. 1b).

Computed tomography scan of the chest

The computed tomography scan of the chest shows the right pleural cavity with dressings (fig. 2). The left upper lobe infiltrate appeared as patchy, well-defined areas of ground-glass attenuation with a superimposed reticular pattern (the "crazy-paving" pattern).

Bronchoalveolar lavage

The bronchoalveolar lavage fluid staining revealed lipid-laden alveolar macrophages (fig. 3). The oil red O stain, which specifically stains neutral lipids, both endogenous and exogenous, was positive for 80% of the alveolar macrophages.

Diagnosis: "Lipoid pneumonia in a male with a bronchopleural fistula"

The patient denied any use of liquid paraffin but questioning of the nurses revealed that they had been applying Vaseline-soaked compresses (Tulle gras Lumiere®; Solvay Pharma, Suresnes, France) in the right pleural cavity for the last 6 months.

Treatment and clinical course

Application of the Vaseline-soaked compresses was stopped. At follow-up, 18 months after diagnosis, the patient was clinically well. However, chest radiographic and computed tomographic opacities persisted.

Discussion

Exogenous lipoid pneumonia is an uncommon condition, usually caused by aspiration of mineral oil. Excessive use of laxatives remains the most frequent cause but many other aetiologies have been described [1].

To the present authors' knowledge, this is the first report of exogenous lipoid pneumonia due to Vaseline-soaked dressings applied in the pleural cavity of a patient with a bronchopleural fistula and open thoracostomy.

Tulle gras Lumiere is an emollient and protective dressing

commonly used in France to facilitate cutaneous healing. It consists of sterile compresses soaked with Vaseline and Peru balm. Dressings of the pleural cavity were performed with the patient in the left lateral position. After cleaning the cavity with sterile saline, the cavity was filled with Tulle gras Lumiere (fig. 2). The Vaseline reached the airways through the bronchopleural fistula. The left upper lobe localisation of the lesions is unusual and may be due to the position of the patient during local care.

In exogenous lipoid pneumonia, many means of penetration of lipid into the lung have been described. Aspiration (typically when paraffin is used as a laxative) and inhalation (of fluid or spray, *e.g.* nasal drops) are the most common. Occasionally, the disease has been caused by bronchographic medium, Jamaican tobacco smoke or accidental intravenous injection of oil [1–3]. Penetration of the airways through a bronchopleural fistula has not been reported before.

The radiographic manifestations of lipoid pneumonia are variable. Low-density alveolar consolidation and ground-glass opacities are the most common radiographic abnormalities [1]. The changes are predominantly localised in the posterior and lower zones of the lungs. On thin-section computed tomography, the crazy-paving appearance, as in the present patient, consists of a network with a smooth linear pattern superimposed on an area of ground-glass opacity. Although this finding is seen in a variety of interstitial and airspace lung diseases, associated with a compatible clinical history, it is suggestive of exogenous lipoid pneumonia [4]. On pathological examination, the ground-glass attenuation and thickened interlobular septa have been shown to represent numerous lipid-laden macrophages that fill and distend the alveolar walls and interstitium, where they may be associated with accumulation of lipid material, inflammatory cellular infiltration and a variable amount of fibrosis [5].

In summary, this case demonstrates that the use of Vaseline in a cavity connected to the airways must be prohibited because it might cause exogenous lipoid pneumonia.

References

- Gondouin A, Manzoni P, Ranfaing E, *et al.* Exogenous lipoid pneumonia: a retrospective multicentre study of 44 cases in France. *Eur Respir J* 1996; 9: 1463–1469.
- Spickard A, Hirschmann JV. Exogenous lipoid pneumonia. *Arch Intern Med* 1994; 154: 686–692.
- Bhagat R, Holmes IH, Kulaga A, Murphy F, Cockroft DW. Self-injection with olive oil. A cause of lipoid pneumonia. *Chest* 1995; 107: 875–876.
- Takeshi J, Harumi I, Nestor LM, *et al.* Crazy-paving appearance at thin-section CT: spectrum of disease and pathologic findings. *Radiology* 1999; 211: 155–160.
- Franquet T, Gimenez A, Bordes R, Rodriguez-Arias JM, Castella J. The crazy-paving pattern in exogenous lipoid pneumonia: CT-pathologic correlation. *AJR Am J Roentgenol* 1998; 170: 315–317.