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Short reports

Paraffinoma confirmed by infrared spectrophotometry

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Although exogenous lipid pneumonia can be readily diagnosed by standard histopathological procedures and some idea of whether the lipid is of organic or mineral origin can be gained from the use of simple fat stains,[1] accurate identification of the lipid requires more sophisticated procedures.[2-4] We report a case that demonstrates how infrared spectrophotometry can be of use in this context.

Case report

The patient was an 85 year old man who had been a coal miner from the age of 14 until he was 50. He developed a productive cough and applied unsuccessfully for industrial compensation at 62 and 68 years of age, no evidence of pneumoconiosis being found. Later he developed severe hypertensive heart disease and died after developing a chest infection. After a coroner's necropsy the lungs were transferred to the Medical Boarding Centre for Respiratory Diseases. In the right middle and lower lobes were two firm masses, 5 and 8 cm diameter respectively. When these were incised, yellow oil ran from a central cavity that was surrounded by black fibrous tissue. Paraffin embedded sections of each mass showed the characteristic appearances of exogenous lipid pneumonia, with empty vacuoles surrounded by foreign body giant cells. Frozen sections were stained with Oil Red O, Sudan IV, Nile blue sulphate and osmium tetroxide, and the results were compared with those obtained from a current case of endogenous obstructive lipid pneumonia distal to bronchial carcinoma (table). This suggested that the oil was of mineral rather than organic origin and liquid paraffin was suspected. A single drop of oil, which had flowed freely from the cut surface of the lung, was sandwiched between two 1·5 mm thick potassium bromide discs and examined in a Perkin Elmer 577 infrared spectrophotometer. A drop of liquid paraffin was examined in like manner. The similarity of the resulting spectra (figure) confirmed the nature of the oil. The liquid paraffin had pre-

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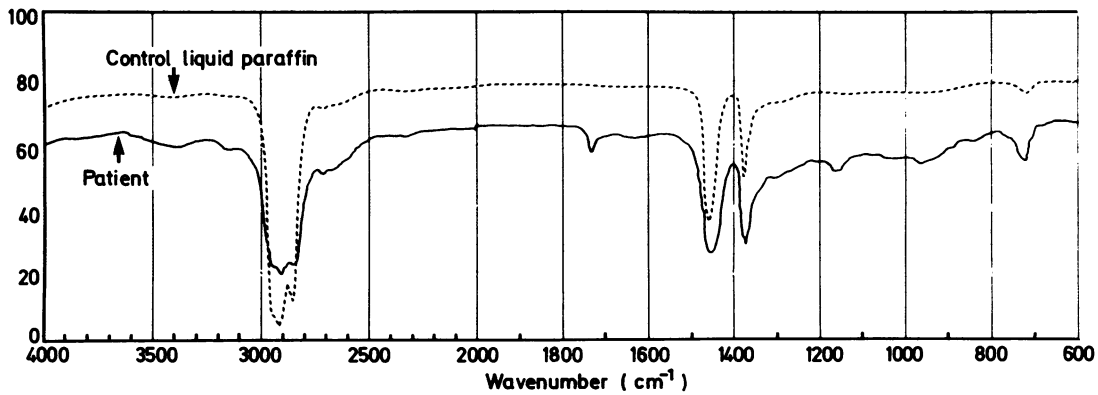
Staining reactions for fat in frozen sections of the patient's lung and a case of endogenous lipid pneumonia

Stain	*Patient's lung*	*Endogenous lipid pneumonia*
Sudan IV Oil Red O	Strongly positive —orange*	Strongly positive —red*
Nile blue sulphate	Negative	Weakly positive —violet
Osmium tetroxide	Negative	Positive

*Difference between orange and red very subtle.



Infrared spectra of the oil from the patient's lung and control liquid paraffin. The main transmission peaks of the two specimens are virtually identical, confirming that the material from the lung is liquid paraffin. The occasional small extra peaks in the test specimen probably represent contaminants derived from the patient.

sumably been ingested to ease chronic constipation and had been inadvertently aspirated. Inquiries revealed that the patient had suffered from very severe prolapsing piles and constipation. Various laxatives had been prescribed but these did not include liquid paraffin.

Discussion

Exogenous lipid pneumonia is frequently diagnosed only when lung tissue, obtained post mortem or excised surgically when cancer is suspected, is examined microscopically. The lipid may be derived from oily bronchographic media, oily nose drops, or liquid paraffin, which—unbeknown to the medical attendant—the patient may be taking in massive doses. Routine fat stains give some idea of whether the lipid is of mineral or organic origin, but without more sophisticated analytical methods the nature of the lipid can only be guessed. This case report shows how infrared spectrophotometry can be used to identify the presence of liquid paraffin conclusively.

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