FIG. 2

movement. A 'ring' sign at the lower pole of the tumour indicates a slight kinking of the œsophagus where the deviation due to the tumour ceases.

Fairly accurate radiological diagnosis is possible, but, in Chi and Adams' series of 63 cases in which

FIG. 3

a pre-operative diagnosis was recorded, 7 (11.1%) had been misdiagnosed as carcinoma.

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OIL GRANULOMA (PARAFFINOMA) OF THE LUNG

M. P. VAIDYA, F.R.C.S.E., F.R.C.S.

Formerly Registrar, Thoracic Surgical Unit, Postgraduate Medical School of London

THE relative insolubility of lipoids in the tissues of the body results in the formation of a granulomatous lesion when these are lodged in the tissues. Thus

Present address: First Assistant, Department of Thoracic Surgery, The London Hospital, London, E.1.

a granuloma of the lung is produced when oil is deposited in it, as a result of fibrous tissue reaction to the presence of such lipid material. The lipoids may reach the lung by aspiration or inhalation (exogenous) or by local deposition (endogenous) as occurs in association with bronchial carcinoma

and certain diseases with generalized disturbances of fat metabolism (Siddons, 1958). It is called *Paraffinoma* if the lipid responsible is liquid paraffin.

The entry of exogenous lipoids into the lungs occurs in various ways. Frequently liquid paraffin is inhaled accidentally by elderly people who have been taking it regularly for chronic constipation. Many sufferers from nasal catarrh spray solutions containing liquid paraffin into the nasal cavities some of which may find its way into the trachea and lungs. Disturbances of swallowing due to neurological disorders or local diseases of the oesophagus such as achalasia (Belcher, 1949) and hiatus hernia may result in the spilling of food into the trachea, especially when the patient is asleep.

The lesion though thought to be rare is not uncommon. Laughlen in 1925 on autopsy on three children found broncho-pneumonia as the cause of death and the mononuclear cells in the exudate contained unstained droplets (fat) of various sizes. Two of these children had been given nasal drops containing liquid paraffin and the third had used liquid paraffin as laxative. He proved by animal experiments that a portion of oily solution given intranasally or orally reached the lungs of the animals and produced a similar type of broncho-pneumonia resulting in the death of the animal. Patterson in 1937 produced a similar condition by using various types of oily materials and found the reaction to be similar with all oils. He labelled the condition as 'Oil-cell pneumonia.' He also observed that relatively large quantities of oil given in a series of small doses are required to produce the typical reaction. Single large doses tended to produce bronchiectasis. Rewell in 1947 described a case of lipid-pneumonia with enlarged mediastinal glands in a young patient of 19 in whom the diagnosis was established on autopsy. There was no history of ingestion or inhalation of oily materials. Siddons in 1958 described three cases of oil granuloma of the lung each of which simulated a carcinoma both clinically and radiologically and was treated by resection. The correct diagnosis was established histologically.

Case Report

A man, aged 48 years, was referred to the Thoracic Surgical Department at Hammersmith Hospital, London, from the Hounslow Chest Clinic. He had a mass miniature radiograph of his chest which showed a suspicious lesion in his right lung. Further X-ray (Fig. 1) of his chest showed a dense irregular opacity in the middle lobe of his right lung, with some pleural adhesions at the right base. He suffered from dry nasal catarrh and apart from mild cough and a little sputum which he had developed recently, he had very few symptoms referable to his chest. Effort tolerance was good and he had had no haemoptysis. There was no history of contact with tuberculosis. He has been smoking ten cigarettes a day for several years. He had an attack of bronchitis in 1954 for which a chest X-ray was taken. This showed slight deformity of the diaphragm but the lung fields were clear.

On examination, the patient was slightly nervous. There was no clubbing and no evidence of any respira-

FIG. 1

tory distress. No abnormality was detected on examination of his respiratory system. X-rays of the nasal sinuses were normal. Bronchoscopic examination was done and revealed no abnormality. No tubercle bacilli or malignant cells were found in the sputum.

Operation. In view of the X-ray findings and the fact that no definite diagnosis had been established by clinical examination or routine investigations it was decided to perform an exploratory right thoracotomy, which was performed on July 25, 1960. The pleura was adherent in places. There was evidence of scarring at the apex of the upper lobe, suggestive of old healed tuberculosis. There were many adhesions to the diaphragm. A hard irregular mass about 5 cm. x 4 cm. was palpated in the middle lobe. No enlarged lymph glands were seen at the hilum. The lesion appeared to be inflammatory in origin. After freeing the lung of the adhesions, middle lobectomy was carried out. The patient made an uncomplicated recovery from this operation and he is doing well. He has no cough or sputum and the rest of the right lung has expanded well.

Pathology (Dr. Paul D. Byers). The specimen is right middle lobe, 100 x 90 x 35 mm. In the posterior part of the lobe is a hard irregular, nodular plaque reaching from the hilum to the pleura, approximately 50 x 40 x 35 mm.

Cut surface (Fig. 2) shows fibrous yellow necrotic areas among blackened fibrous tissue stroma.

Microscopic examination (Fig. 3) shows necrotic foci surrounded by fine fibrosis of lung tissue in which small round empty spaces are conspicuous. Foci of lymphoid tissue are also present and there is a mild inflammatory infiltrate mainly of plasma cells. The empty spaces contain fat that is oil red-positive, Sudan black-positive and osmium-tetraoxide-negative which

FIG. 2

strongly suggests that it is a mineral oil and therefore the lesion is a paraffinoma.

Discussion

Ikeda in 1937 described two types of lesions, as a result of oil aspiration into the lungs—the infantile type and adult type—the former being a diffuse low-grade pneumonia, capable of resolution, occurring mostly in debilitated children with feeding difficulties and the latter being a chronic granulomatous lesion which in contrast to the infantile type does not resolve and occurs in elderly people. Aspiration of cod liver oil or any other similar substance can occur easily into the lungs of a child who is struggling hard to resist the administration of the fluid. During this procedure, the child may cry with the mouth full and part of the contents may easily enter the trachea and lungs. The child very often will suffer from repeated attacks of pneumonia and may develop a chronic granulomatous lesion later in life. Also children who suffer from nasal catarrh are prescribed nasal drops containing lipid material part of which is inhaled into the lungs.

The chronic type of lesion is asymptomatic to begin with and may remain so for a long time. It may be discovered on a routine X-ray examination of the chest as in this case, or may give rise to such

FIG. 3

complications as repeated attacks of broncho-pneumonia, lung abscess, bronchiectasis, empyema and malignant change.

In those cases which are discovered accidentally with an opacity in the lung it may not be easy to establish the diagnosis. If the condition is kept in mind and if the patient is asked about the use of lipoid materials, such may be forthcoming, but in some cases it may be completely absent (Forbes and Bradley, 1958; Rewell, 1947). Fat globules may be found in the sputum and are very suggestive of the nature of the lesion. All routine clinical examinations and investigations may fail to establish the diagnosis. One cannot afford to ignore the presence of such a lesion in the lung without knowing its exact nature. It may be a benign simple lesion or can be a most virulent type of carcinoma, so an exploratory thoracotomy should always be done and if the lesion appears to be a suspicious one and not easily differentiated from a mitotic lesion, frozen section should be done. It is the histology which finally clinches the diagnosis. If it turns out to be an oil granuloma segmental resection or lobectomy, depending upon the extent of the lesion, should be done. To determine the exact nature of the oil responsible the slide is stained with osmium tetroxide which is reduced by animal and vegetable oils but not by mineral oils.

It is always advisable to remove the affected

portion of the lung. The risks of operation are almost negligible. In later stages when complications set in, the treatment becomes more tedious and prolonged.

It is better to prevent the entry of oily materials into the lungs both in children and adults. Proper care and precautions should be taken in feeding the children and prescribing laxatives for patients with chronic constipation. Use of oily nasal drops should be discouraged. Patients with disorders of swallowing or other oesophageal diseases should be warned of the danger of spilling of food into the larynx. In the case described, spraying of nasal cavities with some oily material seems to be responsible for the production of the lesion. Generally, it takes a long time for the development of chronic granulomatous lesions but in this

patient, for such a big lesion the time between the use of oil and the production of the lesion was rather short.

Summary

A case of oil granuloma (Paraffinoma) is presented. It is suggested that the use of oily materials in ways which carry risk of its entry into the trachea and lungs should be avoided. When an opacity is noticed in the lungs of a patient, the diagnosis must be established. If the lesion proves to be an oil granuloma it should be removed.

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ESCH. COLI SEPTICAEMIA TREATED WITH AMPICILLIN

G. M. LEVENE, M.B., B.S.

Medical Registrar, Connaught Hospital, London, E.17

D. A. TOMS, M.B., B.S.

Obstetric House Officer, Thorpe Coombe Maternity Hospital, London, E.17

ATTENTION has been drawn to lack of reports of antibiotic-treated gram-negative septicaemia in this country (Gibson and Barrie, 1961). A case report of a post-partum infection treated with antibiotics, including 'Penbritin' (ampicillin), is therefore of some interest.

Case Report

A primigravida, aged 26, was admitted with pre-eclamptic toxæmia on February 25, 1962. Following surgical induction she was delivered of a healthy live female infant on February 27, 1962. She had a post-partum hæmorrhage of 22 oz. but did not require transfusion. On the morning of March 2, 1962, she produced heavily bloodstained urine, this being associated with increased frequency of micturition, stranguary, dysuria, and severe pain in the right loin. The pain required repeated doses of morphine for its control. That afternoon her temperature rose to 104.8°F. and a rigor ensued. Blood culture taken at this time grew

abundant coliform bacilli with the following sensitivities: nitrofurantoin ++, streptomycin +, chloramphenicol +, tetracycline +, ampicillin +, resistant to erythromycin and sulphonamides. Coliforms were also isolated on the same day from the urine and a high vaginal swab.

Treatment was started with nitrofurantoin ('Furadantin') and streptomycin (see chart). She appeared clinically improved until the evening of March 4, 1962, when she had a further rigor and recurrence of hæmaturia. By the following day her condition had deteriorated with return of severe right loin pain, persistent vomiting and fever. On examination she was acutely tender in both loins, worse on the right. In view of the clinical deterioration it was obvious that the above therapy was failing to control the infection and it was decided to give a course of 'Penbritin'. After ensuring that there was no previous history of penicillin sensitivity an initial dose of 2 g. was followed by 1 g. six-hourly. At this time nitrofurantoin was stopped but streptomycin was continued. Because of troublesome vomiting, cyclizine lactate ('Valoid') 50 mg. was given