cause is not clear, hysteria or psychogenic causes have been implicated. However, many of the reported cases of diaphragmatic flutter were initially misdiagnosed as hysterical conversion disorders, perhaps because it is episodic, it resolves during sleep, and has a tendency to worsen with anxiety or exertion.

Multiple pharmacologic trials in our patient, including many medications anecdotally reported to be successful in treating diaphragmatic flutter, failed. Because the myo- clonic activity of the diaphragm was unilateral, and because anesthetic blockade of the C4 root provided complete although temporary relief, we decided to crush the left phrenic nerve. This procedure, once used for the treatment of tuberculous9 and occasionally used in the treatment of singultus,10 was chosen because return of diaphragmatic function due to regeneration of the phrenic nerve usually occurs within 6 months.5 Phrenic nerve crush is often associated with a decrease in lung volumes,11 however, our patient’s lung volumes and function during exercise after left phrenic nerve crush were normal. We attribute this maintenance of lung function to the preservation of left hemidiaphragmatic tone, demonstrated by the lack of paradoxical diaphragmatic movement seen on fluoroscopy postoperatively. Two months later, our patient had recovered normal function of her left hemidiaphragm while remaining asymptomatic.

In conclusion, an abnormal stridulous disorder may actually be a manifestation of a diaphragmatic abnormality such as diaphragmatic flutter. In patients with hemidiaphragmatic flutter unresponsive to medication, phrenic nerve crush may provide an optimal outcome. Phrenic nerve anesthetic blockade may identify those patients with diaphragmatic flutter most likely to benefit from phrenic nerve crush.

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Self-injection With Olive Oil*

A Cause of Lipoid Pneumonia

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A 48-year-old man with unipolar depression and a psychosexual problem concerning his body image was injecting his scrotum repeatedly with olive oil to increase the size of his genitals. He developed respiratory failure following accidental intravenous injection of olive oil and was found to have lipogranulomatous lesions in the lung and the scrotum.

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Key words: genital self-injection; lipid pneumonia; olive oil

Exogenous lipid pneumonia is usually due to aspiration of lipids or rarely because of intravenous use of oil-based dyes for diagnostic radiologic procedures.1 Although a clinical rarity, exogenous lipid pneumonia has aroused interest because radiologically it can mimic bronchogenic carcinoma.1,2 Further associations of excessive use of lip gloss,3 chapstick,4 and Jamaican tobacco5 with lipid pneumonia have helped maintain interest. We report a case of lipid pneumonia in a man who had been frequently injecting his scrotum with olive oil; he presented following an accidental intravenous injection.

CASE REPORT

A 48-year-old man was transferred to our hospital in a stuporous state. The patient was found unconscious and pulseless (blood pressure 60/40 mm Hg) with a 22-gauge needle stuck in his scrotum and a syringe lying nearby. In the local hospital, he received intravenous saline solution and 60 U of insulin since his serum glucose level was 16 mmol/L. With this, although his blood pressure and serum glucose level (4.6 mmol/L) returned to normal, there was no improvement in his level of consciousness.

The patient had undergone a vasectomy 8 years earlier and a circumcision necessitated by phimosis 2 years before. At the time of circumcision, the surgeon observed a firm swelling in the upper scrotum; a biopsy specimen was taken that revealed lipogranuloma. This had upset the patient and he had signed himself out

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of the hospital.

He came from a 12-sibling family and had an identical twin brother who had committed suicide 8 years previously. This loss had upset him for a long time because he had held a close relationship with his brother. He had been married for 21 years and had two sons. His sex life was unremarkable except for transient impotence for 3 months some 2 years before this event.

On examination he was semiconscious and responded to painful stimuli. His pulse was 108/min, blood pressure was 100/70 mm Hg, respiratory rate was 26/min, and temperature was 36°C. General physical examination revealed bilateral enlarged inguinal lymph nodes. Pupils were dilated but responsive to light. On respiratory system examination, coarse inspiratory crackles were heard bilaterally in all the regions. Examination of genitals revealed marked scrotal edema, enlarged hard testes, scarring of the penis, and induration of the spermatic cord and inguinal ligament.

The hemoglobin was 193 g/L, hematocrit was 56%, and total leukocyte count was 21.7 × 10⁹/L. Results of urine routine and microscopic examination were unremarkable. Serum electrolytes, liver function, and renal function values were normal. His arterial blood gases, on 40% oxygen (with Ventimask), were PaO₂ of 86 mm Hg, pH of 7.23, and PaCO₂ of 35 mm Hg. Chest radiograph demonstrated diffuse lung disease with confluent consolidation. His blood culture was negative and sputum culture isolated *Staphylococcus epidermidis* sensitive to cloxacillin.

He was treated with supplemental oxygen, intravenous cloxacillin, 500 mg, and methylprednisolone, 100 mg, both every 6 h. On day 3, the patient had a tonic-clonic seizure with respiratory arrest requiring intubation, intravenous phenytoin sodium, and phenobarbital. Electroencephalogram revealed modified burst suppression suggestive of hypoxic encephalopathy. A specimen from an open lung biopsy (Fig 1) the next day showed numerous lipogranulomata associated with the small blood vessels. There were multiple foreign body giant cells present surrounding oil-red-O positive droplets. Macrophages contained distinctly larger cytoplasmic vacuoles. There was marked interstitial and alveolar edema; special stain studies indicated the beginning of pulmonary arteriosclerosis.

By the 12th day of hospitalization, the patient was awake and normoxic. He admitted to injecting his scrotum with olive oil approximately every 15 days for 3 years to increase the size of his genitals. A psychiatric consultation diagnosed unipolar depression and therapy with imipramine markedly improved his mental status.

**DISCUSSION**

The clinical picture of exogenous lipid pneumonia ranges from asymptomatic incidental findings on chest radiograph to acute respiratory distress. The clinical features are dependent on the character as well as the volume of the oil.1,2 In this patient, the history, recovery of injection paraphernalia, and the pathologic picture of lipogranulomata surrounding the blood vessels rather than air passages tends to confirm that the lipid reached the lungs via the circulation and not the airways. The rapidity of loss of consciousness following olive oil injection suggests the patient had injected the oil intravenously, causing a massive fat embolism. The lipid pneumonitis may have been due either to transport of olive oil by lymphatics, as suggested by the enlarged inguinal lymph nodes, or to repeated small fat emboli, or a combination of both.

The diagnosis of lipid pneumonia is at times difficult because of the varied forms of presentation and the different ways by which lipids reach the lungs.1,3 Exogenous lipid pneumonia must be distinguished from more common endogenous lipid pneumonia seen distal to airway obstruction. In endogenous lipid pneumonia, macrophages containing foamy cytoplasm accumulate within the alveolar spaces and, to a lesser extent, within the interstitium. Some of the foamy macrophages may contain more than one nucleus, but foreign body giant cells surrounding large lipid droplets are not seen.6,7

The body image problem in this patient is classified (DSM-III-R) as a psychosexual disorder not otherwise specified.5 In this patient, the combination of body image concern and unipolar depression were underlying causes. A psychiatric consultation and therapy with antidepressants helped our patient get rid of the problem.

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