The glands subsided without further treatment. The lad's mother has noticed that his skin "puffs up" when and where the cat scratches him, but this in no way disturbs his general health.

Case 5

A woman aged 58 was seen in the surgical out-patient department on November 9, 1956, because of a lump in the left axilla. It had been present for two weeks, and was not painful or tender; there was no history of injury or discharge from the nipples. She had suffered from an abscess in the other (right) breast three years previously. On examination she was seen to be a very obese woman, with big pendulous breasts; there was a mass the size of a golf-ball in the axillary tail of the left breast, not fixed to the skin but attached deeply. There were no other abnormal physical signs. It was thought probable that the mass was a carcinoma, and admission was arranged for surgical exploration. This was carried out on November 28, when the lump was found to consist of suppurating lymph nodes. The histological report stated: "Chronic purulent inflammation of and granulomatous tuberculosis in axillary glands and adjacent tissue." However, in view of the absence of any other sign of tuberculosis this diagnosis was unacceptable, and cat-scratch disease was considered. The specific antigen was obtained from the Virus Laboratory (Public Health Central Laboratory), Colindale, and on intradermal injection it produced an erythema 12 mm. across, with a papule 5 mm. in diameter—a positive result.

Summary

Five examples of cat-scratch disease are described, four of them in children.

Two of the children are brothers, but they were separately infected with a year's interval in between, by different cats.

The axilla twice was the site of the disease, and the groin twice; one patient presented with conjunctivitis and pre-auricular adenitis.

The histological picture is not clear-cut, and the diagnosis depends upon consideration of all the data, clinical and pathological.

I should like to thank Dr. W. W. Walther, pathologist at the hospital, for his reports; Mr. S. G. Nardell, surgeon, who carried out the biopsies on the first three patients and showed me the fifth; Dr. M. L. Hutchinson, general practitioner at Leyton, for the follow-up note on Case 4; and Dr. G. Boden and Professor C. F. Barwell, of the London Hospital, for their help in establishing the diagnosis of some of the patients.

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Discussing the relation between smoking and lung cancer, Dr. I. HIEGER writes in last week's *Nature* (August 17, p. 308): "The report [of the Tobacco Manufacturers' Standing Committee] brings its heavy guns to bear on the statistical aspect of the problem. It emphasizes that a contingent statistical relation does not guarantee causation. Let us take an example of what could be called contingent. Seaside-sunburn in London schoolchildren, before the motor-car, was always preceded by a railway journey. The railway journey is contingent to the sunburn but is not the cause of the sunburn. To take a strictly practical point of view, the seaside-sunburn could have been avoided by shutting down the railways, and in the same way lung cancer could be largely avoided by closing the cigarette factories, quite independently of whether lung cancer and smoking have a causal or a contingent relationship."

CAT-SCRATCH DISEASE WITH PNEUMONIA

BY

G. C. SHELDON, M.B., B.S.

General Practitioner, Reigate

AND

HUGH SMELLIE, M.B., M.R.C.P.

Medical Registrar, King's College Hospital, London

Since Lee Foshay, in America, recognized cat-scratch disease as an entity (Daniels and MacMurray, 1951) excellent reviews of the condition have appeared in France (Debré *et al.*, 1950), in America (Daniels and MacMurray, 1954), and in Great Britain (Brand and Finkel, 1956). In addition numerous case reports have appeared in the literature. These writers have described the main features of the disorder and its complications. The clinical diagnosis is based on history of contact with a cat, and the appearance of a small local lesion followed by regional adenitis which may suppurate and produce sterile pus and mild general symptoms with fever. Histological examination of an affected node shows reticulo-endothelial hyperplasia with focal granulomata which may undergo central necrosis. An intradermal test (Mollaret *et al.*, 1951a) provides confirmation of the diagnosis. Complications are usually mild, encephalitis (Daniels and MacMurray, 1954) being the most serious so far described. Others include mesenteric adenitis, Parinaud's oculo-glandular syndrome (Daniels and MacMurray, 1954), erythema nodosum, and transient generalized rash.

The disease has been produced in apes, and is thought to be due to a virus of the psittacosis-lymphogranuloma venereum group (Mollaret *et al.*, 1950, 1951b).

We have recently observed a patient who has suffered from typical cat-scratch disease complicated by a severe pneumonia which could not be attributed to any other cause and which responded slowly if at all to antibiotic therapy. The case history is presented in detail, as we can find no previous record of pulmonary complications in this disorder.

Case Report

A housewife and domestic help aged 46 had previously enjoyed good health. She worked as part-time housekeeper for a family who owned an ageing cat. This animal habitually deposited its excreta about the house, and it was the duty of our patient to clean up after it. She was never bitten or scratched by the cat.

In July, 1956, she noticed a small "cyst" on the palm of her left hand. This remained, but she was otherwise quite well until September 1, when she had a severe continuous headache lasting for a week. On September 6 a slightly tender swelling appeared at her left elbow. This was found by Dr. K. R. Hughes, her practitioner, to be an enlarged epitrochlear lymph node. He also noted an enlarged left axillary node, an infected papule on her left palm, and a lymphangitis. The latter proved to be transient, as it was not subsequently observed. He administered 1 mega unit of crystalline penicillin intramuscularly and prescribed "distaquine" V, 2 tablets (120 mg.) four-hourly by mouth.

Two days later Dr. L. DuLake saw her in the absence of Dr. Hughes. She appeared to be more ill, her temperature was 100.4° F. (38° C.), and the epitrochlear node was now the size of a large hen's egg and that in the axilla the size of a tangerine. There was a palmar papule surmounted

by a crust, which was removed to liberate a small bead of pus. Next day penicillin therapy was replaced by tetracycline (250 mg. six-hourly by mouth), and after this her temperature fell to 99° F. (37.2° C.), the nodes became slightly smaller, and she felt better. On September 15, however, she complained of pleuritic pain on the right side and of feeling ill again.

She was admitted to East Surrey Hospital two days later under one of us (G. C. S.). By then she had become very ill. Her temperature was 102.8° F. (39.3° C.), pulse 120, and respirations 26. In addition to the lesions of her left arm already described she had signs of consolidation of the right lower lobe. A chest radiograph confirmed this, showing homogeneous shadowing in the right middle and lower zones and some pleural reaction at the left base, and also showed some pleural reaction at the left base. A blood culture was sterile. Intramuscular penicillin and streptomycin were given. Her general condition improved slightly and during the next day she produced a small amount of "red jelly" sputum. On September 19 she was transferred to King's College Hospital. The palmar lesion was now healing, but the regional lymph nodes were still moderately enlarged. All antibiotic treatment was stopped and the illness was thoroughly investigated during the next three days.

Her haemoglobin was 90% (13.3 g.); white-cell count, 5,950 per c.mm., with 77% neutrophils. Her E.S.R. was 38 mm./hour. A catheter specimen of urine showed a trace of protein, many leucocytes, and *E. coli* on culture. Sputum was purulent on three occasions, but no pathogenic organisms were grown from it and *M. tuberculosis* could not be found in smears. A blood culture was sterile. Her Wassermann and Kahn reactions were negative, and complement-fixation

Summary of clinical and radiographic findings during the patient's illness.

tests for influenza A and B viruses, A.P.C. group viruses, and Q fever were also negative. Serial tests for psittacosis-lymphogranuloma group viruses showed no rise from the original titre of 1/32. The streptococcus M.G. agglutination titre was low. An intradermal injection of 0.1 ml. of cat-scratch antigen produced an area of erythema and induration just over 1 cm. in diameter after 48 hours, which we regarded as a positive result.

Four days after her admission to King's College Hospital the patient was still very ill, and treatment was then resumed, using crystalline penicillin, 1 mega unit six-hourly for eight days. Although there was slight improvement she relapsed on October 2 with a rise in temperature to 101.6° F. (38.7° C.) and increase in dyspnoea. Penicillin was stopped and tetracycline, 250 mg. six-hourly, was given by mouth. She failed to improve in the next two days, so intramuscular

penicillin was again added to the treatment. On October 7 she had another slight relapse with return of the right-sided pleuritic pain for 12 hours. No haemoptysis was present, and no evidence of peripheral thrombosis or change in the appearances on the chest radiograph. After this she gradually improved and the signs of pneumonia receded both clinically and radiographically. All this time the enlarged lymph nodes in her left arm were steadily regressing. Treatment was stopped on October 23 and she was discharged on November 6 much improved. A radiograph taken on December 17, three months after the onset, showed complete clearing of the right-sided pneumonia, the small pleural shadow at the left base remaining unchanged. The previously enlarged epitrochlear node had vanished and the axillary node was very much smaller. Suppuration had not occurred.

The main features of the illness are summarized in the accompanying diagram.

Discussion

There can be little doubt that this patient was suffering from cat-scratch disease, as she had a typical local lesion followed by subacute regional adenitis and a positive intradermal test. The complicating pneumonia had not previously been described in this disease; much effort therefore went into excluding other possible causes for it, such as the pneumococcus, psittacosis, influenza, Q fever, or "virus." All bacteriological and serological tests for these organisms were negative. The clinical picture of protracted illness yet with eventual recovery and sluggishness to respond to antibiotics is reminiscent of psittacosis. However, serial complement-fixation tests for this virus failed to demonstrate a rise in titre, and it seems reasonable to attribute the pneumonia to the cat-scratch organism.

The site of inoculation in this patient is unusual. A lesion on the palm would be unlikely to result from a scratch or bite; probably the infection entered an existing abrasion at that site either from stroking the cat or from contamination by excreta. A patient described by Daniels and MacMurray (1954) was thought to have contracted cat-scratch disease involving the throat and cervical lymph nodes by sniffing cushions soiled by a cat, and it is tempting to suppose that the pneumonia in our patient also followed inhalation of the infecting agent. In fact, we do not believe this to be so, because more obvious enlargement of the hilar lymph nodes should have followed a primary inoculation of the lung. We presume the pneumonia was the result of a viraemia.

The cat was destroyed within a month of the onset of our patient's illness, and a post-mortem examination, conducted by Dr. P. S. Gardner, of the Virus Reference Laboratories, Colindale, revealed no signs of disease. No virus has been isolated despite a most exhaustive search.

Summary

The case of a patient suffering from cat-scratch disease with pneumonia has been described. The pneumonia was thought to be an integral part of the disease, and represents an uncommon but severe complication of this relatively minor complaint.

We are grateful to Dr. L. DuLake for the early clinical findings; to Dr. J. Talbot for bacteriological advice; and especially to Dr. Clifford Hoyle for encouragement and permission to publish this case report.

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