Nocardial Cerebral Abscess with Systemic Involvement Successfully Treated by Aspiration and Sulphonamides

Case Report

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CASES of infection by nocardia asteroides are rare but about 30% of them have involvement of the central nervous system, either by meningitis, abscess, or a combination of both. Of 56 cases reported up to 1954, 18 had involvement of the central nervous system in this way (Krueger, et al.2). Of cases with nocardial meningitis, two cures have been reported (King, et al.,4 and Jacobsen and Cloward5). One cure of an abscess has been reported after excision of the abscess, which was surgically accessible (Krueger, et al.2).

The organism is a pathogenic aerobic actinomyces described by Nocard7 in 1888, and named "Nocardia asteroides" by Blanchard8 in 1895. It is present in soil, in decaying organic material, in grasses, grains, and straw (Webster10). It infects the human body rarely but sometimes takes advantage of reduced resistance locally or generally so that it may cause superimposed infection after tuberculosis, bronchiectasis, steroid therapy, malignant disease, or suppression of the immune defences.8

Almost every organ has been involved, but the lungs, subcutaneous tissues, and brain are those most commonly involved. In the lung, lesions may extend from "coin" lesions to cavitatoin mimicking tuberculosis, actinomycosis, or bronchopneumonia. Pleural and rib involvement are common; and sweats, leukocytosis, and a raised sedimentation rate occur in the illness. The organisms may be readily recovered from subcutaneous swellings, but unless specially searched for may be overlooked (Murray, et al.,7 Lee, et al.8). The disease may respond to prolonged sulphonamide therapy and not to the usual antibiotics (Strauss, et al.9).

We are reporting the first known surviving case of cerebral abscess treated only by local aspiration with instillation of sulphonamide together with systemic sulphonamides continued for a long period.

Case Report

Past History. A 37-year-old man, who worked in a sugar beet factory, had suffered from pneumonia in March, 1961, and again 21 months later; at that time he had infiltrative changes in the right lung interpreted as tuberculosis, but tubercle bacilli were never recovered. The chest still showed consolidation in the right lower zone, presumably in the middle lobe, with enlargement of the left hilum. In August, 1961, x-ray studies showed an opaque mass that extended up from the right diaphragm and was thought to be encysted effusion. Bronchoscopy and bronchograms threw no light on the diagnosis, but in August an x-ray report mentioned the possibility of pulmonary mycosis. In August, 1961, a right thoracotomy was performed with resection of the seventh rib. Adhesions were found but no tumor; no biopsy was taken because it was thought that the appearances were compatible with tubercle, though pulmonary mycosis could not be excluded.

Anti-tuberculous treatment was continued without any resolution of the pulmonary condition until a fluctuant swelling developed at the anterior end of the thoracotomy scar, from which thick green odorless pus was aspirated in December, 1962.

Present Illness. On January 4, 1963, a large bilocular abscess in the supraneck region was drained. Subcutaneous lumps appeared in the left side of the back, in the occipital region in the scalp, and in the left groin. At this stage it was discovered that the pus aspirated in early January grew Nocardia asteroides. The patient became confused and incontinent, and several further subcutaneous swellings appeared over the body. He had a right lower quadrantic homonymous field defect and a mild Gerst-
mann's syndrome, being poor on calculation and right-left differentiation. He was unsteady on his feet, tending to fall to the right. There was no papilledema, and no headache. On January 28, 1963, bilateral intracerebral taps were made through parietal burr holes. The right-sided tap released clear ventricular fluid; the left entered an area of softening from which nocardia was grown. Thereafter he improved. His neurological defects became more discrete, and he developed spastic paresis of the right arm and leg. A ventriculogram showed a gross shift of the ventricular system from left to right, the third ventricle being tilted to the right. A left posterior frontal burr hole, however, yielded no further information, and no softening or abscess cavity was located. Under continuing sulphonamide therapy for some months as an outpatient, all his systemic abscesses cleared up including the one under the occipital scalp. He developed papilledema and headaches, however, and his right homonymous field defect extended to become a complete homonymous hemianopia. The hemiparesis improved, but in view of the development of papilledema it was clear that he would have to be readmitted.

Present Admission. The patient was readmitted in October, 1963. At that time he showed right homonymous hemianopia, 3 diopters of bilateral papilledema, and numerous hemorrhages in both retinae. There was very slight sensory loss in the right limbs; the spastic paresis was present but mild.

The previous burr holes were tapped again. The left posterior frontal tap yielded only normal brain resistance. In the left parietal region there was firm resistance deep within the lobe.

Operation. On October 9, 1963, under general anesthesia a left parieto-occipital flap was turned down. A superficial giotic scar was excised to show a deeply placed thick-walled firm abscess capsule adherent to the posterior end of the thalamus and lying just in front of and medial to the trigone of the ventricle. This yielded 15 ml of thin creamy pus, which was subsequently shown to be sterile. Sulphonamide, chloromycetin, and Steripaque were inserted.

Postoperative Course. The immediate postoperative convalescence was satisfactory. The papilledema began to recede and visual acuity improved. The patient felt well. The abscess cavity was followed by repeated x-ray films and began to shrink. He was allowed to go home, still on sulphonamides.

Long-Term Convalescence. The patient received 6 gm of sulphadimidine orally, daily in divided doses from January, 1963, until March, 1964. In addition, the deep left parietal abscess was instilled with 0.1 gm of soluble sulphadimidine, 0.3 gm of chloromycetin, and 0.75 ml of Steripaque. He was followed in the outpatient clinic at intervals and showed progressive clinical improvement with shrinking of the abscess cavity indicated by x-ray examination. He was last seen in October, 1968, 5 years after treatment of the cerebral abscess and 4\(\frac{1}{2}\) years after stopping the sulphonamides. He seemed well; his neurological deficit had reached a stable state that took the form of a right homonymous hemianopia and some clumsiness of the fine movements of the fingers of the right hand. Speech was normal, and he was able to read fairly well. There was some impairment of position sense in the right fingers and finger movements were slow, but power was good. He had been back at work for 2 years, though he had not been able to resume his previous skilled employment as a fitter.

Discussion

Appreciably some cases of nocardial infection respond better to sulphonamides than others; the organism, however, is supposed to be sensitive to this drug. The resistance of the patient and accessibility of chemotherapy must play a part. It has appeared in the past that excision of a cerebral abscess was necessary for cure, but this is obviously not true, and in order that this point should be clearly established, a long period has been allowed to elapse before this case has been reported. Patients have been known to relapse and die a year after apparently successful treatment, but this case has now been well without chemotherapy for 4\(\frac{1}{2}\) years.

It is clear that early diagnosis consists largely in awareness of the possibility of the condition. Even after systemic spread has occurred, cure is possible. As with most other infections, ordinary surgical principles of management together with specific and
adequate systemic chemotherapy and sterilization of the abscess can succeed as with some more ordinary cerebral abscesses. In this case the abscess cavity lay too centrally in the dominant hemisphere to be excised, but aspiration was obviously necessary because of the progressive signs of increased intracranial pressure.

It has sometimes been thought that an excessively high dosage of sulphonamides is necessary or that urea should be added to aid the effects of the sulphonamides (King, et al. 4). Neither urea nor excessive dosage of sulphonamides was employed in this case. The following is a summary of the antibiotic treatment used.

Sulphonamide therapy was started on January 17, 1963, 1 gm 4 hourly, together with chloromycetin, 250 mg 6 hourly, which was discontinued on February 9. Sulphonamide was continued at its original dosage until March 18 when it was changed to 1.5 gm 4 times a day, which was continued until October, 1963, when it was changed to 1 gm 4 times a day. This was continued until March, 1964, after which all chemotherapy was stopped.

Summary

We have reported the successful treatment of a case of nocardial brain abscess by systemic sulphonamides and aspiration of the cerebral abscess with instillation of sulphadimidine. The infection gradually subsided, and the patient survives 5 years later with some residual neurological deficit, but otherwise well and working.

References