SOLITARY *ASPERGILLUS* GRANULOMA OF THE BRAIN
REPORT OF 2 CASES

IRA J. JACKSON, M.D., KENNETH EARLE, M.D., AND JOSE KURI, M.D.
Division of Neurological Surgery, Department of Surgery, and Department of Pathology,
University of Texas and John Sealy Hospital, Galveston, Texas
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Fungal infections of the central nervous system caused by *Aspergillus* are quite unusual. We were able to find a dozen reports of these lesions in the literature. However, only 7 occurred as solitary intracranial granulomatous tumors. Therefore we believe that the addition of 2 such cases of a single space-occupying mass may be of interest.

*Aspergillus* is a microscopic fungus consisting of nonseptate, elongate hyphae which originate in mycelial foot cells and bear conidiophores of characteristic structure. There are over 350 authenticated strains.\(^{10,16}\) The fungus is a regular inhabitant of the soil, occurring predominantly in warm damp climates. It is frequently isolated from cereal products, unmilled grain, hay, and other stock feeds. The fungus is generally found as a laboratory contaminant. *Aspergillus fumigatus* is perhaps the most common species producing disease in man but it is likely that this situation results from factors other than its being most pathogenic, such as frequency of effective exposure.

The infection usually involves the lungs, skin, external ears, paranasal sinuses, orbit, and occasionally the bone and meninges.\(^4\) The common pathological picture is one of necrosis and acute inflammation.\(^1\) However, the central nervous system is not only a rare site for this fungus, but also may present the pathological features of chronicity.

In 1897 Rémon\(^14\) observed pulmonary *Aspergillus* as an occupational disease in wig makers and pigeon feeders. It was not until almost 50 years later that Coe\(^3\) reported such a case which was brought to trial before the industrial accident board and judged to be an occupational disease. The literature reveals in general two different types of central nervous system affliction. The commoner is that of a systemic infection with cerebral metastasis, and the other is intracranial lesions with or without an adjacent portal of entry. Moniz and Loff\(^15\) in 1931 reported the necropsy findings of a left frontal lobe abscess in which the etiological agent was not cultured but was morphologically compatible with *Aspergillus*. Since the patient had a history of a corneal ulcer, the authors postulated that the orbit was the portal of entry for the fungus. In the same year Just\(^9\) recorded a case of right frontal lobe abscess and granuloma in which the *Aspergillus* fungus was cultured from the aspirated surgical fluid. At autopsy, only the frontal lobe lesion was present and the surgeon felt that the mode of entrance intracranially was via the nose and frontal sinus. Several years later Guillian *et al.*\(^7\) presented the necropsy findings of a patient with a right frontal lobe abscess and localized basilar meningitis which appeared to have been caused by *Aspergillus* although no culture was obtained. They, too, were of the opinion the fungus entered through the orbit. Oppe\(^12\) as early as 1897 reported a case of *Aspergillus* of the brain in which the primary infection was in the sphenoid sinuses. Wät-
jen\textsuperscript{18} in 1928 told of such a cerebral extension with the primary infection arising in the ethmoid cells.

We were able to find only two reports, one being questionable, in which the patient benefited by surgical intervention. Peet\textsuperscript{15} presented before the American Neurological Association in 1946 the case of a 7\textfrac{1}{2} year-old child who did quite well following the removal of a large dense fibrotic mass containing many small abscesses from the cerebellum. A pure culture of \textit{Aspergillus} was obtained. There is no note as to the length of the followup. However, Cawley's\textsuperscript{2} report a year later from the same institution describes the case study of a patient which appears to be the same that Peet had presented. This patient died 9 months after admission to the hospital despite intensive and protracted treatment, including surgical intervention, with a downhill course. The other possible surgical success was reported by David \textit{et al.}\textsuperscript{5} in 1951 in which an encapsulated temporal lobe abscess was removed containing \textit{Aspergillus amstelodami}. Their patient did well following surgery, but there was no notation as to the length of the followup.

Cawley's account in 1947 was probably the first report of a case of generalized \textit{Aspergillus} infection with involvement of the central nervous system. He reported another such situation several years later, but the pathological studies are not too convincing regarding the central nervous system involvement.\textsuperscript{6} Several other reports in the literature dealt mainly with \textit{Aspergillus} meningitis.\textsuperscript{9}

\section*{CASE REPORTS}

\textit{Case 1.} JSH \#88041. S.D., a 36-year-old colored male, was admitted on July 10, 1953 to the Neurosurgical Service of the John Sealy Hospital because of visual loss. About 16 months previously he began to have some frontal headaches. A month before admission a rapid loss in visual acuity occurred.

He had come to the Out-Patient Clinic a year before complaining of "sinus trouble" of about 8 years' duration. The otolaryngologists felt the patient had a chronic sinusitis and nasal polyps. They removed the nasal polyps and lavaged his antrums. A considerable amount of pus was present on the right but none on the left side. The right side continued to drain for several months. He did not return to the Out-Patient Clinic until almost a year later when he presented himself because of failing vision.

He stated that 15 years previously he had been struck over the right eye and since then had no visual perception in that eye.

\textit{Examination.} He was an afebrile, well developed colored male who did not appear acutely or chronically ill. The neuropsychiatrists felt that he exhibited no abnormal mental signs. His sense of smell was absent bilaterally. There was no light perception nor reaction to light in the right eye. Vision in the left eye was 3/200. Visual fields revealed a concentric constriction of the left field. There was optic atrophy on the left. The right fundus was not visualized as there was a partial dislocation of the right lens with capsular opacity.

Roentgenograms of the skull showed slight separation of the coronal sutures, erosion of the right petrous ridge, and a calcified pineal gland displaced posteriorly and down. X-rays of the chest, urinalsysis, and blood and spinal serology revealed no abnormalities. Findings on peripheral blood studies were normal except the eosinophilic count ranged between 7 and 24 per cent on several occasions. The spinal fluid pressure was 280 mm. of water with 288 WBC/c.:mm., 148 mg. per cent of protein and a Lange curve of 0000000.

A bilateral carotid arteriogram was done on July 14, 1953 which revealed a large expanding lesion in the right anterior fossa (Fig. 1A).

Ten days later a pneumoencephalogram demonstrated a definite displacement to the left of the lateral and third ventricles (Fig. 1B).

\textit{Operation.} A right frontal craniotomy (J.J.J.) was done on July 24, 1953 under general anesthesia. The entire frontal lobe was almost completely replaced by a hard mass of tumor