UNILATERAL HYDROCEPHALUS RESULTING FROM OCCLUSION OF FORAMEN OF MONRO

EBEN ALEXANDER, JR., M.D.,* AND E. HARRY BOTTERELL, M.D.

Department of Neurosurgery, Toronto General Hospital, and Department of Surgery, University of Toronto, Ontario, Canada

(Received for publication August 25, 1948)

The treatment of brain abscesses in all stages of encapsulation by radical removal of abscess and adjacent softened brain tissue has been reported by several authors. The reduction in over-all mortality using this method in conjunction with systemic and intraventricular penicillin is a consistent finding in all the reports in the literature. Chorobski and Kunicki, in a recent publication reviewing all reported brain abscesses treated by radical removal, state that there were no cases in which meningitis was reactivated by the operation provided antibodies were used.

In view of the growing enthusiasm for this type of treatment of brain abscesses, 2 cases are presented with unilateral hydrocephalus secondary to obstruction of the foramen of Monro following removal of a brain abscess.

The causal relationship between obstruction in the cerebrospinal fluid circulation and the development of hydrocephalus has been suspected for over half a century and proved experimentally since 1913. The first experimental production of hydrocephalus in animals by occlusion of one foramen of Monro by Thomas was overshadowed by the publications of Dandy at about the same time. Both workers gave adequate experimental proof of the development of hydrocephalus in animals following occlusion of the cerebrospinal fluid pathways.

Severe reactions in the ependyma of the lateral ventricles, 3rd ventricle, or aqueduct of Sylvius producing subsequent gliosis and obstruction to the interventricular passages have been occasionally reported. The cause of the ependymitis in some cases has not been determined. In others the gliosis of the ependyma has been secondary to known or suspected meningitis. Burr and McCarthy as early as 1900 attempted to duplicate this picture by injecting irritating substances into the lateral ventricles of experimental animals. They successfully produced ependymitis but unfortunately did not allow their experimental subjects to survive long enough to develop dilatation of the ventricles.

The first clearly defined clinical case of unilateral hydrocephalus from obstruction to one foramen of Monro was described by Cushing. In this presentation Cushing considered the obstruction was secondary to ependymitis, the result of so-called “brain fever” some months previously. The

* Bowman Gray School of Medicine, Winston-Salem 7, North Carolina.
number of cases reported in the literature is small and the surgical attempts to alleviate this condition have been remarkably few. Dott in 1927 described a patient 9 months of age with obstruction of one foramen of Monro and severe unilateral hydrocephalus. The patient was apparently permanently relieved of symptoms of increased intracranial pressure by an opening, made at operation, through the septum pellucidum.

More recently Cairns et al. have described 2 cases resulting from gunshot wounds of the head in which portions of the lateral ventricles had been sealed off from the rest of the ventricular system by scar tissue. These patients suffered from local dilatation of the lateral ventricle confined to its occluded portion of sufficient severity to cause generalized increase in intracranial pressure. In one patient communication between the occluded inferior horn of the lateral ventricle and the body of the ventricle was established and the choroid plexus within the cyst removed. In the other case the choroid plexus was removed. In both patients the increased intracranial pressure was relieved.

During the past 2 years one of us (E.H.B.) has treated 8 patients with brain abscess by means of radical excision. There has been 1 death. In 2 instances in which the abscess was poorly encapsulated with but thin walls and in close proximity to the lateral ventricle, the abscess was ruptured during removal and the adjacent ventricle opened. In both patients penicillin was used locally in the cerebral cavity and in one streptomycin was also used. Intraventricular injections of these antibiotics were also made postoperatively. The prompt recovery with complete bacteriological cure was impressive. The subsequent insidious development of signs which were mistakenly interpreted as recurrence of an abscess and satisfactory surgical cure of these patients when the true nature of the condition was found by ventriculography are related below.

PRESENTATION OF CASES

Case 1. B98276. R. P., male, 19 years.

Summary. Frontal osteomyelitis and left frontal lobe abscess. Radical removal of abscess; ventricle opened; intraventricular penicillin. Temporary improvement followed by gradual onset of signs of space-occupying lesion of left cerebral cortex. Unilateral hydrocephalus; obstruction left foramen of Monro, relieved by opening made through septum pellucidum.

Present Illness. This 19-year-old boy was in good health until Jan. 3, 1947, when acute left frontal sinusitis developed. On Jan. 9, 1947, a swelling in the left frontal region was drained and purulent material from this cultured Streptococcus haemolyticus. On sulfonamide therapy he made a gradual recovery until about Feb. 15, 1947, when he was admitted to the Neurosurgical Service of the Toronto General Hospital in semi-coma.

Examination. Temperature 101° F., pulse 60, respirations 10. He was drowsy, rather poorly nourished and responded, answering simple questions correctly. Findings were: edema of the left forehead, moderate bilateral papilledema with small retinal hemorrhages, and weakness of the right lateral rectus muscle. Power