Spontaneous “High-Pressure Cerebrospinal Rhinorrhea”
Due to Lesions Obstructing Flow of Cerebrospinal Fluid

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Cerebrospinal fluid (CSF) rhinorrhea resulting from trauma or following cranial surgery is common and well documented. Less prevalent causes of CSF leakage are infection of the paranasal sinuses with osteomyelitis of adjacent bone, congenital anomalies of the brain and its investing membranes such as nasal meningoceles or meningoencephaloceles, and destructive neoplastic lesions at the base of the skull.

“Obstructive” rhinorrhea is far less common and has not received wide attention in the surgical or radiological literature. In this variety, the anatomical defect responsible for CSF leakage arises as the direct consequence of long-standing or intermittently severe hydrocephalus due to some lesion interrupting the flow of CSF. High intracranial pressure can cause gradual bony erosion, usually of the cribiform plate, and attenuation of the adjacent investing membranes at the base of the skull. Their eventual disruption leads to escape of cerebrospinal fluid into the nose. Under these circumstances CSF rhinorrhea may occur spontaneously, although in certain instances a trivial head injury apparently may complete the opening in an already thinned-out cribiform plate.

This report concerns four patients having rhinorrhea caused by intracranial lesions obstructing CSF flow, a situation we have designated as spontaneous “high-pressure CSF rhinorrhea.” Two of these patients had benign circumscribed mass lesions occluding the CSF pathways at the foramen of Monro; removal of these tumors eliminated the rhinorrhea. One patient had obstructive hydrocephalus secondary to a parieto-occipital meningioma. The CSF rhinorrhea abated following tumor removal but ceased entirely only after a secondary repair of the dural defect in the cribiform region. In the fourth patient with aqueductal stenosis, CSF rhinorrhea ceased only after a shunting procedure successfully reduced the increased intracranial pressure.

Case Reports

Case 1. This 41-year-old man came to the emergency room in May, 1967, with profuse rhinorrhea from the left nostril. The rhinorrhea had appeared spontaneously 4 years previously. Since that time it had been copious, lasting 3 to 4 days during each attack and occurring at least once a week. A history of intermittent bifrontal headaches was elicited, but no definite relationship between headaches and rhinorrhea could be established.

In 1954, the patient had been admitted to another hospital complaining of headache, lethargy, blurred vision, and attacks of “numbness” and unsteadiness in both legs. Examination at that time had recorded a dull affect, papilledema, truncal ataxia, and a left Babinski reflex. Skull radiographs had been normal but lumbar puncture disclosed raised CSF pressure; a ventriculogram had revealed gross ventricular dilatation secondary to an obstructing mass in the region of the foramen of Monro. Headaches, papilledema, and ataxia disappeared after radiation therapy for a presumed glioma of the third ventricle.

Examination. On admission to this hospital in May, 1967, no physical or neurological abnormalities other than the profuse left rhinorrhea could be demonstrated. Plain skull films and bifrontal cranial tomograms were unremarkable. Encephalography on May 29, revealed a round shadow in the third ventricle at the foramina of Monro with the typical radiographic appearance of a colloid cyst (Fig. 1 left). The lateral ventricles were dilated but not to the degree

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Fig. 1. Case 1. Pneumoencephalograms. *Left:* The colloid cyst is identified (large white arrow) as is the massa intermedia (small white arrow). The foramen of Monro is markedly narrowed (crossed arrow). *Right:* Note the distended lateral ventricles and the fistulous tract outlined by air (white arrows) extending to ethmoid sinuses.

demonstrated in 1954. A fistulous tract outlined with air extended from the inferior aspect of the frontal horn of one lateral ventricle towards the ipsilateral ethmoidal sinus (Fig. 1 right).

*Operation.* On June 7, 1967, a colloid cyst was excised through the dilated right lateral ventricle. The patient's postoperative course was uneventful. A repeat pneumoencephalogram 1 month after operation demonstrated that air now passed freely from below into both lateral ventricles. The lateral ventricles were smaller and the ventriculonasal fistulous tract could no longer be seen. There has been no recurrence of CSF rhinorrhea since operation.

*Case 2.* This 48-year-old man was seen in December, 1963, with a 1-year history of rhinorrhea. The nasal discharge had occurred for 3 months and then ceased spontaneously. Vision in both eyes had been failing progressively. There had been no headaches.

*Examination.* Neurological examination revealed decreased visual acuity with right-sided optic atrophy, left-sided papilledema, and a left inferior quadrantanopsia. Pneumoencephalography on December 12 demonstrated dilated lateral ventricles and a third ventricular mass in the region of the foramina of Monro (Fig. 2).

*Operation.* On December 13, a papilloma of the choroid plexus of the third ventricle extending into the right foramen of Monro was removed through the right lateral ventricle. The postoperative course was uneventful. There was slight improvement in vision and complete resolution of papilledema. A repeat pneumoencephalogram 2 years after operation revealed persistent ventricular dilatation, but no ventricular obstruction. This patient has been followed for 4 years since operation; there has been no recurrence of CSF rhinorrhea.

Fig. 2. Case 2. Pneumoencephalogram shows mass in third ventricle obstructing the cerebrospinal fluid pathways. The mass, a choroid plexus papilloma, was removed at surgery.