UNILATERAL EXOPHTHALMOS DUE TO CEREBELLAR TUMOR AND ORBITAL DEFECT

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(Received for publication January 19, 1948)

A young woman of 26 was admitted to the Cleveland Clinic Hospital on April 25, 1945, because of blindness and protrusion of the left eyeball. She had been subject to generalized headaches for 18 months. Thirteen months prior to entry she had been in an automobile accident and had sustained a fracture of the left arm, ecchymosis about the left eye, and was unconscious for about a day. Exophthalmos of the left eye had first been noticed 10 months prior to entry. Generalized headaches had continued with loss of vision progressing to complete blindness 6 weeks prior to entry. Projectile vomiting and mental confusion had recently developed.

Examination. The patient was dull, apathetic, and mildly confused. She was totally blind in both eyes. The pupils were dilated and fixed, and there was advanced bilateral papilledema, and a severe degree of exophthalmos in the left eye. The exophthalmometer reading in the right eye was 20 mm. and in the left eye 28 mm. Extraocular movements were full. There were no cranial nerve palsies and no other positive neurologic findings. There was no nystagmus and no more uncertainty in walking than in a totally blind, partially bedridden patient.

Roentgenograms of the skull showed evidence of increased intracranial pressure, as indicated by thinning of the anterior and posterior clinoid processes and convolutional markings in the frontal area. The left orbit appeared denser than the right, although it was thought that this appearance could be due to the increased volume of the soft tissue content. Roentgenograms of the nasal sinuses were negative. Examination of the ears, nose, and throat disclosed no abnormality. The urinalysis and blood count were normal, and the blood Wassermann reaction was negative.

A diagnosis of meningioma of the sphenoid ridge with invasion of the orbit was made.

1st Operation. On April 30, 1945, a left frontal craniotomy was performed under pentothal anesthesia. The tension of the dura was increased. A brain cannula was introduced into the anterior horn of the left ventricle, which was found to be dilated, and about 60 cc. of clear colorless ventricular fluid escaped. The dura was incised, and the frontal lobe was elevated. No tumor was found on the sphenoid ridge. The inferior surface of the frontal lobe was firmly adherent to the dura over an area just lateral to the cribiform plate. The dura was elevated from the roof of the orbit until this area of adhesion was disclosed, and an outpouching of the dura into the orbit through a smooth round dehiscence of about the size of a five-cent piece was seen. This bony opening was enlarged by removing the surrounding portion of the roof of the orbit. A semicystic encapsulated mass was found in the upper inner portion of the orbit. The membrane, which was continuous with the dura and which surrounded the cystic mass,
was dissected from the periorbital fascia. When this mass was entirely freed, the dura about the neck of the mass was divided and the contents were found to be brain tissue, semicystic in character. This mass was obviously an encephalocele. During the course of the dissection an outpouching from the inferior portion of the anterior horn of the ventricle was entered. The operator decided at this point that the lesion was probably a traumatic encephalocele extending into the orbit and that the lesion responsible for the hydrocephalus was perhaps a posterior fossa tumor or a traumatic stricture of the aqueduct of Sylvius.

Course. Following this procedure the patient was more alert mentally, but the left eye began again to protrude as the intracranial fluid reaccumulated. This fluid was aspirated by means of a needle introduced through the scalp, but it gradually increased in amount until by the 9th postoperative day it measured 80 cc. When the fluid was aspirated the eyeball receded to approximately its normal position (Figs. 1 and 2). By the 16th postoperative day the amount of fluid recoverable measured over 150 cc. at each aspiration.

On the 17th postoperative day a ventriculogram was performed, demonstrating an obstructive hydrocephalus with dilatation of the 3rd ventricle and no visualization of the aqueduct or of the 4th ventricle.

2nd Operation. Immediately following the ventriculogram a suboccipital craniotomy was performed, and a large cerebellar cyst was found in the medial portion of the right cerebellar lobe. An incision was made into the cyst, and a small red nubbin of hemangiomatous tissue about 1 cm. in diameter was disclosed on the posterior wall. This lesion was excised with the overlying area of cerebellar cortex, and the wound was closed.

Course. Following this procedure the intracranial pressure was relieved. The accumulation of fluid beneath the scalp decreased each day. Convalescence was satisfactory, and the patient was discharged from the hospital on the 17th postoperative day. There was no return of vision.

The patient was last seen on Jan. 29, 1946, 8 months after operation. She was totally blind, due to secondary optic atrophy. The left eyeball was still more prominent than the right. The exophthalmometer readings were 20 mm. in the right eye and 23 mm. in the left eye. No
pulsation of the globe was present. The patient was cheerful and alert and exhibited no cerebellar signs.

COMMENT

It appears likely, as indicated by her headaches, that this patient had increased intracranial pressure from the hemangiomatous cyst of the cerebellum for 5 months prior to the injury. The trauma probably produced a fracture of the orbital roof, and the increased intracranial pressure pushed the thin bone fragments into the orbit, and they subsequently became absorbed. The resulting traumatic encephalocele dislocated the globe, producing the unilateral exophthalmos.

A NEW NEEDLE FOR CEREBRAL ANGIOGRAPHY

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(Received for publication December 8, 1947)

The diagnostic value of cerebral angiography depends entirely on the quality of the angiograms obtained. A modern x-ray installation and satisfactory photographic technique are required in order to obtain serviceable pictures.

Angiograms are comparable only when obtained under standard techniques. In performing angiography by the ordinary methods, variations of injection and technique are so great at times that individual differences cannot be estimated with any certainty. The technique of angiography must be so simple and offer so few difficulties that essential variations are prevented. Only special cases showing disturbances of circulation (spasms, aneurysms or angiomas) may necessitate an altered technique.

Percutaneous angiography is the procedure of choice and is applicable in all cases with the exception of extraordinary conditions, such as abnormal course and dimensions of the carotids.

For most purposes, it is expedient to effect a sectional and chronologic filling of the vascular system of the brain; consequently the time required for the injection and the variation in the amount of contrast fluid to be injected are limited. The time required for the injection must be graduated in order that a vascular section may be filled uninterruptedly. Below that limit pictures showing a partial filling with empty spaces of varying size are obtained at the usual exposure of 1–3. Too prolonged an injection produces a simultaneous filling of several vascular sections, which results in hazy pictures that are difficult to analyze. The passage of the blood from the area of injection into the common carotid artery, as well as the internal carotid artery, to the cerebral capillaries seems to require about 1.5 seconds, a time which the injection must not surpass if optimal filling is desired.

The amount of contrast fluid required varies according to the kind that is used. Everything else being equal, smaller amounts of thorium may be used than of the iodines, but the former should be employed only in case of need or in deleterious cases, because they remain in the organism; they should not be employed in routine angiographic examinations. The only real advantage of the thoriums is the absence of vascular irritation, which limits the value of iodines in scientific research of the vascular system. In order to obtain sufficient contrast, iodines must be used in concentrated solutions of 35 to 50 per cent, and blood concentration must also be high. The injection appears to require 15 to 20 ml. of contrast fluid, and this amount must be injected into the artery within 1.5 seconds.

With the type of injection needles that are commonly obtainable and in general use, it is impossible to make 20 ml. pass out of a record syringe in less than about 3.5 seconds when using finger power. This is due principally to friction in the injection needle. The needles used generally have a diameter of 1.5 mm. It is not possible to use coarser needles because of hemostatic difficulties, so that this is not the way of decreasing the friction. Materially shorter needles cannot be used.