interested in his surroundings. At the time of his transfer to another hospital 10 days later he was up and about. For obvious reasons a follow-up report is not available.

COMMENT

In the usual case of traumatic pneumocephalus there is a skull fracture involving one of the paranasal sinuses or mastoids. In the sinuses and mastoids air can be compressed by the act of sneezing, coughing or swallowing. Thus, if a communication exists between the intracranial cavity and these pneumatic spaces, air under pressure may be forced into the subdural, subarachnoid or ventricular cavities.²

In the patient herein reported there was a penetrating wound of the brain with the lodgment of a foreign body in the ventricular system, thus producing a free communication between the ventricles and the outside. When the site of entrance of the foreign body was in a dependent position cerebrospinal fluid escaped and air entered. Treatment requires no special comment. As in all penetrating and perforating brain wounds early and thorough debridement and a tight dural closure are indicated. In most instances a graft of temporal fascia or pericranium is required to bridge the defect in the dura.

REFERENCES


NEOPLASM OF THE CHOROID PLEXUS OF THE LEFT LATERAL VENTRICLE

HARRY WILKINS, M.D., RONALD SMITH, M.D., AND BÉLA HALPERT, M.D.

Department of Surgery and Department of Pathology, University of Oklahoma
School of Medicine, Oklahoma City, Oklahoma

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Neoplasms may arise from the cells covering the choroid plexuses of either of the lateral, of the 3rd, or of the 4th ventricles. They usually have the structure of a papilloma: columnar or tall columnar cells are mounted on delicate connective-tissue stalks. This arrangement may be orderly with little variation in the height of the cells or there may be marked variation with loss of polarity of the cells and heaping up of the cell nuclei into several rows. At times the growths remain on the surface, or they invade the subjacent brain tissue. Because of the variations in structural patterns and extent of invasion some of the growths are regarded to be benign, others malignant.

A total of about 90 cases of neoplasms arising in one of the choroid plexuses have been reported to date (Herren,² Posey,³ Walker and Horrax¹¹). While there is no general agreement as to the nature of these neoplasms, approximately 23 of them were considered to be cancerous (Walker and Horrax¹¹ Hirsch and Elliott,⁶ Van Wagenen,¹⁰ Dandy,² Graves and Fliess,⁴ Turner and Simon,⁹ Drucker,³ Musacyn,⁷ and Berger⁷). Among the total number of cases on record, according to Posey,⁸ only 22 were diagnosed clinically as brain tumors and approached surgically. An additional case has since been recorded by Walker and Horrax.¹¹ Complete recovery was reported in 5 patients. Among these, 4 of the neoplasms arose in the 4th ventricle and 1 in a lateral ventricle; this was the only one occurring in a child (Van Wagenen¹⁰). Because of the peculiar structure and behavior of neoplasms arising in one of the choroid
PLEXUSES our observations on a patient in whom such a growth was successfully removed from the left lateral ventricle are presented.

REPORT OF CASE

L.Y., a white boy, aged 6 years, was first seen at the University of Oklahoma Hospitals March 20, 1944, complaining of intermittent attacks of nausea and vomiting, and of episodes of disturbance of consciousness for 3 years. At first the nausea and vomiting lasted for about 3 minutes and were followed by sleepiness. For the last 1½ years he lost consciousness following the episodes of nausea and vomiting. He never had clonic convulsions. By the time of admission the attacks were occurring several times daily.

On admission he was well developed, well proportioned, well nourished, and apparently in good health. The pulse rate was 90; blood pressure was 96 systolic and 60 diastolic. Some exophthalmos was noted. The eyegrounds revealed no changes in the retina and no papilledema. There were no demonstrable changes in the visual fields. Percussion and auscultation of the head disclosed no abnormality. The functions of the cranial nerves appeared intact. Deep and superficial reflexes were normal, with no abnormal reflexes present. The Babinski and associated signs were negative. Muscle power was not impaired and was equal on the two sides. Pain, temperature, touch, position, and vibratory senses were undisturbed.

The rbc. was 3,950,000; hb. content, 13 gm.; wbc. was 5,700 with neutrophilic granulocytes 64, lymphocytes 36 per cent. The urine was yellow, slightly cloudy, acid, with no albumin and no sugar. There were occasional white blood cells in the sediment. The Mazzini test of the blood was negative. The B.M.R. was minus 23 per cent. Roentgenograms, anteroposterior and lateral, revealed increased convolutional markings, with an area of nebulous, punctate densities in the left temporal region, interpreted as calcifications (Fig. 1). A

![Image](image_url)
diagnosis of intracranial neoplasm with calcification was made, with localization in the left temporal region apparently within the central portion of the temporal lobe.

On April 7, a low left temporoparietal incision was made and a bony flap, about 5 cm. in diameter, was reflected and its lower third removed for decompression. The dura was then reflected from below leaving it attached above. No neoplasm was encountered on the surface of the exposed field. A needle inserted into the middle convolution of the temporal lobe met with resistance at a depth of about 3 cm. After coagulation of the pial vessels a horizontal incision, 3 cm. long, was made and the neoplasm exposed. The surface of the neoplasm was rather vascular. The growth was circumscribed but not encapsulated and seemed to occupy the central portion of the temporal lobe. After removal of the presenting part of the neoplasm with a wire loop cautery, the periphery was resected leaving a space of about 20 cc. and exposing inferiorly the tentorium. After hemostasis the wound was closed in layers with interrupted silk sutures, leaving a Penrose drain to the extradural space through a stab wound. The drain and skin sutures were removed the 2nd postoperative day. The incision healed smoothly, convalescence was unevenful, and the patient was discharged from the hospital 16 days after operation on April 23. Roentgenograms at this time disclosed no residual areas of calcification within the left temporal lobe.

Roentgenograms 2 years later on Feb. 2, 1946, revealed some regeneration of the osseous tissue around the edges of the bony flap. There were no areas of calcification or other signs of recurrence. When last seen July 23, 1947, the child was attending school, making average grades. The site of decompression was soft and pulsating. There was a right upper quadrant homonymous defect in the visual fields.

Pathological Description. The specimen obtained at operation consisted of mottled yellow-gray, soft fragments of tissue from about 0.5 to 3 cm. in diameter, weighing together about 20 gm. (Fig. 2). Microscopic preparations from numerous fragments disclosed tall columnar cells of varying heights mounted on delicate connective-tissue stalks or forming acinar tubular structures (Fig. 3). These neoplastic cells had large, oval, deeply stained nuclei. These in places were crowded and some were in a state of division. The height of the cells varied from low cuboidal to tall columnar. Condensation of the cytoplasmic material and the presence of cilia were noted on the free margins of the cells. Neoplastic cells were also seen invading and replacing brain tissue (Fig. 4). Lavender-stained granules, some with concentric laminations, were seen amidst the acinar tubular or papillary structures. The connective-tissue stroma was scanty and in places barely discernible. Retrogressive changes from necrosis to calcification were observed throughout the various preparations.

The appearance of the cells suggested that they arose from the choroid plexus. The variation in the height of the cells, the apparent loss of their polarity in places, their invasion of subjacent brain tissue and the presence of necrosis favored the assertion that the neoplasm was morphologically malignant. The subsequent course, however, left doubt as to the correctness of this assertion.

COMMENT

Neoplasms arising from the ectodermal cellular elements of the central nervous system must be given special consideration when one attempts to correlate their structure with their
Figs. 3 and 4. Microscopic appearance of the growth. Tall columnar cells of varying heights are mounted on delicate connective-tissue stalks or form acinar tubular structures. ×110.

behavior. Growths obviously cancerous, which originate from cellular elements of the central nervous system, expand usually by direct extension invading and replacing adjacent tissues and only rarely by seeding along the cerebrospinal pathways, and practically never by metastasis.

In our case there was variation in the height of the cells with a seeming loss of their polarity. The cell nuclei stained deeply, and there was invasion of the subjacent brain tissue
with areas of necrosis. The structural pattern of the growth thus favored its morphologic classification as cancerous. The clinical course, however, survival for almost 4 years with no evidence of recurrence, is not in line with such a classification, unless it were assumed that the growth was completely removed at operation. The behavior of this neoplasm might be due to a process of self-limitation in that the brain did not provide favorable medium for its growth. Retrogressive changes ranging from necrosis to calcification occurred in the invading neoplasm probably because of an inadequate supply of stroma and blood vessels.

SUMMARY

The clinical history is presented of a white boy, aged 6 years, who had a neoplasm of the choroid plexus of the left lateral ventricle. The growth was successfully removed and though morphologically the neoplasm was malignant the child is living and is well almost 4 years after the operation. This is believed to be the 6th reported instance in which a neoplasm of one of the choroid plexuses has been successfully removed, the 2nd such occurring in a child, and the 2nd in which the neoplasm arose in a lateral ventricle. It is, however, the 1st in which apparent recovery occurred though the growth was considered morphologically malignant.

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