Case Reports and Technical Note

Meningioma of the Fourth Ventricle*

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The literature concerning meningiomas of the parasagittal region and convexity is voluminous. By contrast, that covering meningiomas of the ventricular system is scanty indeed. There are more than 50 examples of intraventricular meningiomas presently in the literature, but most of these deal with meningiomas involving either the lateral ventricles or the third ventricle. So far as we have been able to determine there are only 8 previously reported cases of meningiomas of the fourth ventricle.

Vogel and Stevenson4 in 1950 reported their case of meningothelial meningioma of the fourth ventricle, arising from the tela choroidea. This tumor was an incidental finding at autopsy in a 65-year-old male. The tumor weighed 5 gm. In this article Vogel and Stevenson reported the only 2 previously known cases of meningioma of the fourth ventricle. The first of these was Sachs's2 case of a 27-gm., nonpsammomatous, fibroblastic meningioma arising in the region of the inferior tela. This tumor occurred in a 38-year-old female.

The second recorded case is that reported by Abbott and Courville,1 and occurred in a 15-year-old male who, at autopsy, 5 years later, had a massive fibrous meningioma filling the third and lateral ventricles.

Ten years following Vogel and Stevenson's paper Schaeer and Woolsey5 again reviewed the literature and were able to add 5 more cases, including their own. In their article they discussed briefly the cases of Haas and Ritter, Zuleta and Londoño, and Petit-Dutaillis and Daum. The case of Haas and Ritter was that of a fibroblastic meningioma occurring as an incidental autopsy finding in a 41-year-old male. In Petit-Dutaillis and Daum's case the tumor occurred in a 55-year-old female. In both of these cases the meningioma was believed to have originated from the inferior tela choroidea.

Zuleta and Londoño have reported 2 cases, both in children. The first was a grayish, soft tumor occurring in an 8-year-old male. The second was a similar appearing tumor occurring in the floor of the fourth ventricle in a 12-year-old male. Both of these tumors had the gross appearance of ependymomas, but on histological examination they were given the diagnosis of meningiomas.

Schaeer and Woolsey5 submitted their case as representing the largest meningioma of the fourth ventricle described previously. Theirs was the case of a 42-year-old male who presented the usual signs of posterior fossa mass. At the time of exploration of the posterior fossa a large hard tumor was found in the fourth ventricle, which extended well up to the tentorial notch, particularly on the left side. The tumor was removed in toto and was described as a 65-gm., white, fibrous mass, measuring 88 × 38 × 43 mm.

We wish to submit at this time what we believe to be the 9th reported case of meningioma of the fourth ventricle.

Case Report

Mrs. T., aged 38, was admitted to the Mary Fletcher Hospital on Nov. 29, 1961 because of persistent headache. The patient had been in good health until 3 years previously, when headache developed gradually. This was described as deep and originating in the right parietal area with radiation into the posterior cervical region. Initially this headache was controlled by aspirin, but over a period of months became refractory to this therapy. A year prior to entry the patient underwent examination but no neurological abnormalities were detectable at that time. Two months before admission she became concerned when slurring speech was noted. During the last 4 weeks she noted paresthesias in the left arm, hand and leg, to be followed 2 weeks before entry by forgetfulness and clumsiness of the left arm and leg. Associated with this were several episodes of inadvertent stumbling and dropping of objects from the left hand. During the last week the patient noted the onset of horizontal diplopia, which had persisted until the time of admission.

Examination. On admission there was one-half dioptr of papilledema bilaterally. Diplopia could be produced by upward gaze as well as left lateral gaze. Convergence was poor. There was slight limitation of upward gaze bilaterally. Rapid, rhythmical alternating movements were done poorly with the left upper extremity. Finger-to-nose test was done poorly with the left arm and there was definite ataxia demonstrated in the heel-to-knee test on the left. Mentally the patient was alert and cooperative but gave the impression of being mildly euphoric.

Laboratory Data. Lumbar puncture carried out shortly before neurosurgical consultation revealed an initial pressure of 570 and the spinal fluid contained 26 mg. protein with no cells. Routine roentgenograms of the skull were normal.
Bilateral carotid angiography then was carried out, revealing stretched pericallosal vessels consistent with the picture of obstructive hydrocephalus (Fig. 1).

A vertebral angiogram demonstrated the basilar artery to be pushed forward against the clivus throughout its entire length (Fig. 2). There also was evidence of early herniation of the posterior inferior cerebellar artery down through the foramen magnum. On anteroposterior visualization the vertebral angiogram showed no lateralizing abnormalities.

Operation. Upon opening the posterior fossa no abnormalities were seen except that the vermis was slightly broadened and folia of the vermis and cerebellar hemispheres were somewhat flattened. The cerebellar tonsils extended through the foramen magnum to the level of the axis. The fourth ventricle was explored and no abnormalities were detected within it, although it was our impression that the vermis bulged into it in an abnormal fashion. A needle introduced into the cerebellar hemispheres and the vermis encountered no cystic fluid. An incision now was made into the vermis. No abnormalities were reached for a depth of 1 cm. when a yellowish-gray neoplasm was encountered, somewhat firm in its posterior inferior aspect, but with a soft grayish superior portion. A mass 2 x 2 cm. in size was removed. There was a well demarcated posterior limit, which became less clear at the roof of the fourth ventricle, where it was attached at its mid-point, but into which it did not protrude—rather the obstruction had been caused by normal ventricular roof and cerebellar tissue, which had been displaced forward by tumor (Fig. 3). The firm portion of the tumor was resected, but the soft superior portion was removed by aspiration.

Course. The clinical impression was ependymoma, and postoperatively 3000 r were administered to the posterior fossa.

Microscopic sections (Figs. 4 and 5) revealed cells with moderately abundant cytoplasm and uniform ovoid nuclei. Many cells were elongated and in several areas cells were grouped in whorls. The microscopic diagnosis was meningothelial meningioma. The slides then were sent to Dr. F. S. Vogel, who had written the summary on meningiomata in this area in 1950. He concurred in this diagnosis.

Discussion

When we use the term meningioma we are using an anatomical rather than an histological term.

This is a practice upon which pathologists ordinarily frown, but meningioma has become such an expressive and convenient term that it seems unlikely to be replaced.

The term enables us to avoid some of the discomforts of attempting to name a specific cell of origin in many cases of tumors attached to the meninges, and so the simple term meningioma commonly suffices for such lesions. The vast majority of these will be attached to dura mater, but it usually has been stated that they arise in the dura mater from the included arachnoid villi. Hence we think of the common locations for meningiomata along the sagittal sinus and in various areas about the base, but it is this very usualness or habitualness that causes us to be so
surprised when meningiomas are discovered deep in the substance of the brain.

Even so, the intraventricular meningiomas occur frequently enough so that they are considered when a tumor is known to occur in a ventricle. This is not true, however, of a midline cerebellar tumor with what at first appears no meningeal connection. Yet the anatomist demonstrates that at the midpoint of the fourth ventricle, where the anterior medullary velum becomes the posterior medullary velum the pia arachnoid dips rather deeply into the cerebellum. It was at exactly this point that our neoplasm had its attachment.

Most of the tumors here are said to be fibroblastic in type, but this one was a meningothelioma by the Bailey-Bucy classification, or syncytial meningioma according to the classification of Dorothy Russell. To the naked eye and on frozen section it was thought to be an ependymoma. Roentgen-ray therapy was given in this belief. Tumors in this location will number less than .1 per cent of meningiomas yet surgeons should remain aware of this possibility, since the prognosis with total removal is highly favorable.

Summary

A case of meningioma in the roof of the fourth ventricle has been presented as the 9th reported instance of the occurrence of this tumor in this location. Reference is made to the preceding 8 cases in the literature.*

The structure of our tumor resembles more closely those reported by Zuleta and Londoño than any other. It is interesting to note that their patients were both children. Ours was an adult female, aged 38.

References


* Since the submission of this paper Abraham and Chandy have reported a similar case. (Abraham, J., and Chandy, J. Meningiomas of the posterior fossa without dural attachment. A case report. J. Neurosurg., 1963, 20: 177-179.)