Pituitary Adenoma Associated with Intraventricular Meningioma: Case Report

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ABSTRACT

Although rare, the association of intracranial meningiomas and pituitary adenomas has been reported. Intraventricular meningiomas are unusual, and meningiomas located in the fourth ventricle are even more so. We report a patient who harbored a prolactin-secreting pituitary adenoma and a fourth ventricle meningioma who was treated with surgical resection of the latter and medical treatment for the former. To our knowledge, this is the first report of such an unusual association.

KEYWORDS: Intraventricular tumor, meningioma, pituitary tumor, prolactinoma

The association of meningiomas with other types of brain tumors has been previously reported. These other tumors may develop after radiation therapy or be associated with syndromes such as neurofibromatosis (von Recklinghausen's disease).^{1,2} Although a pituitary tumor associated with an intracranial meningioma has also been reported, the occurrence is unusual.³⁻⁷ Meningiomas constitute about 15% of all intracranial tumors, but intraventricular meningiomas are rare lesions that account for only 0.5 to 2% of all intracranial meningiomas. The most common intraventricular location is in the lateral ventricles, but the presence of these tumors in the fourth ventricle is still rare.⁸⁻¹¹ We report the case of a 45-year-old man

who was simultaneously diagnosed with a prolactinoma and a fourth ventricle meningioma. To our knowledge, this is the first report of such an association.

CASE REPORT

This 45-year-old man presented with a few months' history of generalized malaise and weight loss. The last 2 weeks before diagnosis, he also had experienced progressive headache, vomiting, and gait ataxia. The patient underwent computed tomography (CT) and was referred to our institution. There, magnetic

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Figure 1 Preoperative magnetic resonance images show the fourth ventricular lesion and the associated invasive sellar/ anterior skull base lesion.

resonance imaging (MRI) (Fig. 1) showed a large fourth ventricular tumor, incipient hydrocephalus, and an anterior skull base lesion with an invasive aspect. His neurological examination revealed only gait ataxia. After consultation with an otolaryngologist, obtaining a tissue sample through the oral or nasal mucosa was considered. However, the symptomatic lesion was thought to involve the posterior fossa and was large enough to require decompression.

Therefore, the patient underwent a posterior fossa craniotomy and microsurgical resection of the fourth ventricle tumor, with the goals of decompressing the posterior fossa and obtaining tissue for diagnosis of the lesion. The tumor had a good cleavage plane and was attached to the choroid plexuses. It was resected completely (Fig. 2), and the patient's postoperative recovery was uneventful. The histological diagnosis was

Figure 2 Postoperative computed tomography scans confirm complete resection of the fourth ventricle tumor and the sellar/anterior skull base lesion.

meningioma. Hormonal work-up revealed a serum prolactin level of 6800 ng/mL. The patient was then started on bromocriptine. His response was excellent. On his first follow-up MRI

(Fig. 3), the anterior fossa mass had already shrunk. The patient, who is being followed clinically by Neurosurgery and Endocrinology, has had no further symptoms.

Figure 3 Magnetic resonance images obtained 6 months after the patient's posterior fossa surgery and initiation of bromocriptine therapy show the shrinkage of the sellar lesion.

DISCUSSION

Meningiomas are the most common nonglial intracranial tumor, accounting for about 15% of all intracranial tumors. Nonetheless, intraventricular meningiomas are very rare, corresponding to 0.5% to 2% of those tumors. These lesions are usually located in the lateral ventricles, and their presence in the fourth ventricle is rare.^{8–11} Pituitary tumors are also commonly encountered in neurosurgical practice. Their true incidence is difficult to determine because a large number are probably asymptomatic. Estimates, however, range between 2.7% and 27%.

The association of meningiomas and pituitary tumors is very rare. If patients who have undergone previous radiation therapy are excluded from consideration, the presence of these two types of tumors in the same patient becomes even rarer.^{3,7} To our knowledge, the association of an intraventricular meningioma and a pituitary adenoma in a patient without previous radiation therapy had never been reported.

Diagnostic consideration should probably include metastatic germ cell tumors and ependymal tumors. Hormone levels have been suggested to have a role in either inhibiting or stimulating the growth of meningiomas. The presence of prolactin receptors in most meningiomas is established, as is the role of prolactin in stimulating the growth of these lesions. In our patient, the coincidence of the two tumors may have set the stage for the very high levels of prolactin to accelerate the growth of the meningioma in the fourth ventricle and thereby initiating the patient's clinical symptoms. Except for the very high levels of prolactin, our patient had no other evidence of hormonal hypersecretion.^{12–16}

The decision to remove our patient's posterior fossa lesion proved to be adequate. His symptoms were relieved completely, and his hyperprolactinemia was diagnosed in a timely fashion. The latter allowed clinical treatment of the sellar tumor without tissue diagnosis or further surgery, which contributed to his good outcome.

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Commentary

The authors present the unique case of a fourth ventricular meningioma associated with a prolactin-secreting pituitary adenoma. The meningioma was resected surgically while the pituitary lesion was controlled medically. Perhaps the most interesting feature of the case report is the possible causal link between the meningioma and elevated prolactin levels. It would have been helpful to know if the meningioma was histochemically positive for prolactin receptors.

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Commentary

The authors report the first case of a pituitary tumor associated with a fourth ventricle meningioma. They chose to operate through the posterior fossa tumor. Appropriately, they elected *not* to obtain a tissue sample of the skull base mass because the diagnosis was established with a prolactin level of 6800 mg/mL. This patient illustrates the rapid response of many macroprolactinomas to medical therapy, obviating the need for surgery.

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