Carcinoma of the Pituitary Gland with Metastases to the Spinal Cord and Roots of the Cauda Equina

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PITUITARY tumors of a malignant nature are uncommon and, for the most part, rarely metastasize. While local invasive tendencies occur with both malignant and nonmalignant neoplasms of the chromophobe type, distant spread either by the blood stream or by the cerebrospinal-fluid channels occurs with extreme rarity. Metastatic deposits have been discovered in the liver and lungs in most of the reported cases with disseminated lesions. Implantation into the distant areas of the spinal canal has been reported in only 2 cases.3,18 It is the purpose of this communication to review briefly the available reports on metastatic carcinoma of the pituitary gland and to present 1 patient with spread of the tumor by means of the subarachnoid fluid to the roots of the cauda equina. The management of this patient treated by means of laminectomy, rhizotomy and radiation will be discussed.

Case Report

K.B., a 29-year-old man, was first seen in December, 1956 complaining of blurred vision in the temporal quadrants of both eyes which was associated with severe frontotemporal headache and a loss of his former vigor and libido. Intermittent headache of a similar nature had first occurred in 1949. These headaches were most intense in the morning. There was no visual complaint and he was admitted to the U. S. Naval Hospital in Bethesda in May, 1950 because of the persistence of these symptoms. The general physical and neurological findings were normal at that time. Visual fields using 8/330 objects were normal and visual acuity in both eyes was 20/20. Roentgenograms of the skull, however, disclosed an enlarged sella measuring 15.0 mm. in anteroposterior diameter and 13.0 mm. in depth. Spinal-fluid pressure was normal; total content of protein was 24 mg. per cent; sugar and chlorides were normal. It was felt that the patient’s headaches were caused by a chromophobe adenoma of the pituitary gland and radiation in surprisingly minimal dosage was given to the gland, 260 r in 11 days. Headache decreased in intensity after therapy but tended to recur in a milder form.

Examination. The patient was moderately obese with a light beard and finely textured pale skin. Auxillary and pubic hair was sparse. The only positive neurological finding was a gross bitemporal hemianopsia. The optic discs were of normal color and delineation. Roentgenograms of the skull now disclosed thinning of the dorum sellae. The clinoids were sharp and the pituitary fossa was abnormally wide and deep with suggestive erosive alterations in the floor.

Treatment. Radiation was repeated, a total of 2,000 r being delivered to both right and left temporal areas in air with a calculated 3,000 r depth dose to the pituitary gland.

Course. Visual fields prior to therapy confirmed the presence of a bitemporal hemianopic defect most severe in the superior quadrants, the left more than the right. Following therapy, visual acuity which had been 20/40 improved to 20/20 and the fields returned to nearly normal except for a slight residual deficit in the superior temporal sectors.

The patient was first admitted to the Long Island Jewish Hospital on Aug. 17, 1959 because of rapid visual failure, more intense on the left side, where in addition to a defect in the temporal field the nasal quadrants were severely contracted. Deterioration had become evident during the preceding month with pallor of the optic disc on the left now being apparent. Roentgenograms of the skull disclosed enlargement of the sella with demineralization of the floor and of the dorum. A lumbar pneumoencephalogram showed a soft-tissue mass emanating from the sella and projecting into the 3rd ventricle. Angiography revealed straightening of the carotid siphon and elevation of the anterior cerebral arteries in their first portion. Spinal fluid was faintly yellow. The protein content was normal. The electroencephalogram was normal as was the uptake of radioactive iodine.

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**Operation** performed on Aug. 24, 1959 was complicated by excessive swelling of the right frontal lobe, the tip being amputated at the termination of the procedure. The tumor, which appeared a deeper red than the usual gross appearance of a chromophobe adenoma, was biopsied and partially removed with difficulty by means of suction and curettage.

**Course.** After a stormy postoperative course, the patient gradually improved, manifesting transient euphoria, forgetfulness, incontinence, disorientation and confusion. A slight paresis of the right upper limb persisted at discharge on Sept. 10, 1959 with mild apraxia of the right hand. The visual deficit was severe in the left eye but had improved appreciably on the right.

**Histologic Report.** Sections of the specimen removed at operation (Fig. 1) revealed nests of cells, some of which were arranged radially around vessels. The nuclei were ovoid and normochromatic. The cytoplasm contained neither eosinophilic nor basophilic granules and was chromophobic. A number of calcospherites were seen. This lesion had the histologic features of a chromophobe adenoma and was reported as such. Evaluation of any invasiveness was not possible from this specimen.

**Course.** After discharge, vision deteriorated further and fell from 20/25 in the right eye on Sept. 30, 1959 to 20/200 on Oct. 24, 1959 and finally to 20/300 on Oct. 28, 1959. Vision in the left eye was maintained at finger-counting at 6 in. with severe constriction of the visual fields. Optic atrophy became more apparent on the left. Pneumoencephalography was repeated and disclosed further extension of the extrasellar portion of the tumor upwards and anteriorly into the 3rd ventricle, encroaching on the foramen of Monro.

**2nd Operation.** On Dec. 2, 1959 the wound was reexplored. Adhesions were stripped from the right optic nerve and chiasm after removal of an additional portion of the right frontal lobe. The tumor was surprisingly firm and resisted dissection until a central area of softening with semicystic consistency lent itself to further evacuation by means of curette and suction. The left optic nerve was only poorly perceived through dense adhesions that could not be removed without danger to the adjacent carotid artery. It was felt that evacuation of the content of the tumor had been satisfactory and that the right optic nerve and chiasm had been well decompressed. A stainless-steel plate was inserted to cover the defect in the frontal area left after the initial exploration.

**Course.** The postoperative course was uncomplicated, the patient being maintained on steroids before and after surgery.

A third course of radiation was given, this time with the cobalt-60 unit and providing a total tumor dose of 4,000 r. Vision improved slowly in the right eye and in June, 1961 had levelled at 20/30. No useful return of function was observed on the left.

**Histologic Report.** This time scant fragments of tissue were available for examination. Some of them showed recognizable portions of anterior