Neck paraganglioma with a pituitary adenoma

Case report

Bennett Blumenkopf, M.D., and Kim Boekelheide, M.D., Ph.D.

Department of Surgery, Division of Neurosurgery and Department of Pathology, Duke University Medical Center, Durham, North Carolina

A 66-year-old man presented for evaluation of a mass of the sella turcica. Previously, he had undergone resection of a neck paraganglioma, which subsequently metastasized to the lungs. A tumor was removed transsphenoidally that proved to be a pituitary adenoma. This combination failed to fit the classical multiple endocrine neoplasia syndromes.

Key Words: paraganglioma · pituitary adenoma · carotid body tumor · multiple endocrine neoplasia · sella turcica

MULTIPlicity of tumors of glandular tissues is a recognized phenomenon. Familial syndromes designated as multiple endocrine neoplasia (MEN) have been defined by specific combinations of the glands involved:16,24 MEN I (Wermer's syndrome) consists of the association of islet cell adenoma, pituitary adenoma, and parathyroid adenoma;25 MEN II (Sipple's syndrome) combines medullary carcinoma of the thyroid, adrenal medullary adenoma, and parathyroid hyperplasia.22 Genetic factors, possibly relating to aberrations in the embryonic layer of each gland's derivation (ectoderm versus endoderm), perhaps account for these combinations. Recently, patients have been reported with tumors or hyperplasia of glands involved in both the defined MEN complexes.29 One other report, discussing cases of paragangliomas of the head and neck, mentioned the association in one patient of a chromophobe adenoma of the pituitary.13 These cases raised the question of a new pattern of MEN.

Paraganglia are bodies of cells originating from the neural crest in specific anatomic locations in the body outside the adrenal gland. They seem to function as chemoreceptors. By histological, pathological, and the above embryonic criteria, tumors of this tissue, namely paragangliomas, are mostly classified with tumors of the nervous system.12

Our report concerns a patient at the Durham Veterans Administration Hospital with a previously resected neck paraganglioma, and biopsied lung metastases, who presented for evaluation of a sella turcica mass. This proved to be a pituitary adenoma. The clinical and pathological features of this case, and a review of the subject, form the basis of this communication.

Case Report

This 63-year-old black man presented in August, 1977, for evaluation of a pulsatile mass of the left posterior aspect of the neck. The mass had been present for several years, with a recent increase in size. Initially painless, it had also become discomforting. Medical history was remarkable only for a cigarette-smoking habit of one-half pack per day. Family history included a sister who, at 47 years, was diagnosed as having a left frontal glioblastoma multiforme.

First Admission. There was a pulsatile mass on the left posterior aspect of the neck. There was no thrill, but a bruit was heard posterolaterally over the mass. The oropharynx was normal. The neurological examination was normal. Chest x-ray films revealed changes indicating chronic obstructive pulmonary disease. Skull series showed thinning of the dorsum sellae with questionable erosion of the posterior floor. Computed tomography (CT) of the neck showed a large mass on the left with erosion of the spinous process of C-2. Angiography revealed a hypervascular mass in the postauricular area measuring 5 x 6 cm. A

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Fig. 1. A: Photomicrograph showing cells with mildly irregular nuclei and uniform cytoplasm grouped together in an alveolar pattern typical of a paraganglioma. H & E, × 250. B: On electron microscopy, sparse dense-core granules of variable size and shape are seen, verifying the neuroendocrine nature of the tumor. × 10,000.

Pneumoencephalogram was also performed, revealing an enlarged sella but no intrasellar air or evidence of suprasellar mass effect.

First Operation. At surgery via a U-shaped incision over the left posterior region of the neck, a firm rubbery tumor was found beneath the left paraspinal musculature. It was quite vascular. The tumor extended to the base of the skull, without penetration. It was also found to extend medially and anteriorly to the transverse process of C-1, and appeared to end in a “peripheral nerve.” The tumor was removed. Postoperatively, the patient noted hoarseness of speech. An otolaryngological examination found left vocal-cord paralysis.

Pathological Examination. The tumor was composed of uniform cells with round to oval nuclei and moderately abundant granular eosinophilic cytoplasm (Fig. 1A). The cells tended to cluster in nests surrounded by a vascularized stroma in an alveolar pattern typical for paraganglioma. The extensive tumor necrosis, clinically reported bone destruction, and focal mitotic figures suggested a malignant diagnosis. Electron microscopy (Fig. 1B) revealed the presence of cells with occasional, somewhat irregular, dense-core cytoplasmic granules, as anticipated with a lesion of neuroendocrine origin. Thus, the final pathological diagnosis was of a malignant paraganglioma of possible vagal origin.

Second Admission. The patient, now aged 66 years, returned in September, 1981, with complaints of severe retro-orbital headaches. These lasted 2 to 3 days and had occurred monthly for the 3 months prior to admission. In addition, he described difficulty obtaining an erection for approximately 1 year.

On general examination, he was found to have atrophic testes. The neurological and visual field examinations were normal. Chest radiography revealed two large lesions. Skull series was reported as unchanged from the 1977 films. Endocrinological testing showed elevated luteinizing hormone and follicle-stimulating hormone levels, and a low testosterone level consistent with primary gonadal failure. A brain CT scan showed a sella turcica mass with suprasellar extension (Fig. 2). The patient underwent a percutaneous needle biopsy of the lung lesion. Pathological examination was consistent with the tumor type previously removed from his neck.

Second Operation. The sella turcica was explored via a transsphenoidal approach. When the dura was opened, the pituitary gland was observed to be dis-
placed anteroinferiorly by a white-yellow friable tumor. The tumor was removed by blunt curettage dissection, resulting in total gross resection.

**Pathological Examination.** The tumor was composed of uniform cells with round nuclei and eosinophilic cytoplasm without marked granularity (Fig. 3A). The cells tended to form in sheets or sinusoids in association with a vascular stroma, and occasional acini and papillary projections were evident. Electron microscopy (Fig. 3B) revealed cells with numerous regular dense-core granules, 100 to 200 nm in diameter. Small accumulations of an amylloid-like fibrillar material were seen in an extracellular location. The distinct light microscopic appearance and relative abundance of well formed neurosecretory granules favored a new primary tumor of sellar origin for this lesion, rather than metastatic spread from the original neck mass. Thus, the final pathological diagnosis was of a nonfunctional pituitary adenoma.

**Discussion**

Our patient had a neck mass appearing histologically to be a paraganglioma. The angiogram was also consistent with this diagnosis, revealing a hypervascular mass. Although not considered preoperatively, its location near the skull base and the postoperative hoarseness suggested a potential origin in the vagal body. Paragangliomas are rarely found in the head and neck regions. In a 38-year period at Memorial Sloan-Kettering Cancer Center, 69 such tumors were found among 600,000 cases, for an incidence of 12 per 100,000. Both sexes appear equally affected, and the third through sixth decades of age are most often involved. The adenohypophysis is classically composed of three general cell types: chromophobes representing 52%, acidophils 37%, and basophils 11%. Tumor histology is roughly of similar distribution: chromophobe adenomas 79%, acidophilic adenomas 15%, and basophilic adenomas 6%. However, recent advances in pituitary endocrinology, and improved light and electron microscopic studies, have made this classification scheme too simplified and outdated.

A number of other neoplasms and nontumorous conditions can present clinically like a pituitary tumor, and exhibit similar radiographic changes in the sella turcica. Rarely, disseminated carcinoma may involve the pituitary gland, most frequently without symptoms. This was encountered in 4% to 15% of...
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patients with metastatic disease, especially breast cancer.8,20

The incidence of pituitary tumors is low and that of paragangliomas is extremely low. Both types of tissue are involved in one of the classically defined MEN syndromes, MEN I and MEN II, respectively. Although the chance of coincidence in this patient cannot be denied, he might represent another example of a mixed-MEN syndrome.

References

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