Pituitary hemangioblastoma in a patient with von Hippel-Lindau disease

Case report

Noel G. Dan, F.R.A.C.S., and Dermer E. Smith, F.R.C.P.A.
Departments of Neurosurgery and Histopathology, St. Vincent's Hospital, Sydney, Australia

A case of von Hippel-Lindau disease is described in which a pituitary hemangioblastoma was present as well as a cerebrovascular anomaly.

Key Words - von Hippel-Lindau disease - pituitary - hemangioblastoma

To our knowledge, no occurrence of a pituitary hemangioblastoma has been previously reported. We are presenting such a case.

Case Report

A 26-year-old man first came to St. Vincent's Hospital in June, 1958, with a 9-week history of vertigo when moving his head. Apart from nystagmus with extension of the neck, examination was normal. Lumbar puncture and cerebrospinal fluid examination were normal, as were caloric testing, hemoglobin, and air encephalography. He was readmitted in October, 1964, complaining of occipital headache and blurred vision. The diagnosis was multiple posterior fossa angiomata considered unsuitable for excision. The patient was given a Holter ventriculoatrial shunt followed by cobalt-60 irradiation. The papilledema subsided and symptoms disappeared rapidly; he remained well until late 1970, requiring a shunt revision in 1965.

The patient was readmitted in January, 1971, with a 2-month history of occipital headache. The Holter valve was revised because of a blocked ventricular catheter. His postoperative recovery was complicated by fever associated with a low-grade Staphylococcus albus septicemia. During this admission a hemangioblastoma of the left retina was first observed. Subsequently, he had three further admissions because of the septicemia. He could not tolerate removal of the ventriculoatrial shunt, developing severe vertigo, a 1.5 cm mass of abnormal vessels just below the foramen magnum to the left of the midline whose main supply was from the left posterior inferior cerebellar artery. The diagnosis was multiple posterior fossa angiomata considered unsuitable for excision. The patient was given a Holter ventriculoatrial shunt followed by cobalt-60 irradiation. The papilledema subsided and symptoms disappeared rapidly; he remained well until late 1970, requiring a shunt revision in 1965.

The patient was readmitted in January, 1971, with a 2-month history of occipital headache. The Holter valve was revised because of a blocked ventricular catheter. His postoperative recovery was complicated by fever associated with a low-grade Staphylococcus albus septicemia. During this admission a hemangioblastoma of the left retina was first observed. Subsequently, he had three further admissions because of the septicemia. He could not tolerate removal of the ventriculoatrial shunt, developing severe vertigo,
Pituitary hemangioblastoma

Fig. 1. Vertebral angiogram. Left: Arterial phase, anteroposterior view, showing a tumor blush in the vermis. Right: Early venous phase, lateral view, showing the blush above and below the basiocciput of the two posterior fossa tumors.

drowsiness, diplopia, and headache when it was removed. At no time during these admissions was there any evidence of abnormal endocrine function. The sella measured $14 \times 10 \times 7$ mm. Vertebral angiography in July, 1971, demonstrated a large vascular lesion low in the vermis of the cerebellum. This was supplied by a large posterior inferior cerebellar artery and drained by large veins which filled early.

He was comatose when readmitted in August, 1971, and died of overwhelming infection.

Family History. The patient's father died of multiple myeloma, his mother of carcinoma of the colon. Neither of the patient's parents nor his three siblings demonstrated any evidence of von Hippel-Lindau disease. His eldest child, a 15-year-old girl, has a tapetoretinal dystrophy but also has a hemangioblastoma of the right eye which has been treated by photocoagulation; her two siblings, aged 12 and 11 years, are free of angiomatous stigmata to date.

Postmortem Findings. Basal meningitis was present. The cerebellum contained a solid tumor 4 cm in its maximum diameter that included a small cyst. This occupied a large part of the vermis, was visible on the surface of the tonsil and expanded anteriorly to occlude the fourth ventricle (Figs. 1 and 2). A discrete and similar tumor 1.5 cm in diameter was present in the area postrema; anterior to this tumor was a single 5 mm cyst extending throughout the lower part of the medulla oblongata to form a syringobulbia. In the cerebral white matter of the right hemisphere in the region of the body of the caudate nucleus and the adjacent internal capsule was a 3 cm lesion consisting of thick-walled blood vessels. There were minute lesions on the right retina and a slightly larger lesion on the left retina. Each kidney weighed 200 gm and contained cysts up to 1.5 cm in diameter and pinkish-yellow solid tumors up to 1 cm in diameter. The pancreas contained small thin-walled cysts up to 5 mm in diameter. Adrenals,
FIG. 3. Section of pituitary lesion showing pituitary tissue below (arrow) and tumor above. H&E, • 140.

testes, and epididymi were normal. There was a small irregular tumor $3 \times 2 \times 2$ mm, on the left side of the anterior lobe of the pituitary gland (Figs. 3 and 4).

The cerebellar and brain-stem lesions showed the histology characteristic of hemangioblastoma. Numerous thin-walled vascular channels were separated by large polyhedral cells with pale cytoplasm. The tumor in the anterior lobe of the pituitary had an identical histological pattern. Hemangioblastomas were present in both retinae. The lesion in the cerebral white matter consisted of numerous thick-walled blood vessels, several of which had undergone sclerosis and obliteration. The pancreatic cysts were lined by columnar epithelium, an appearance consistent with ductal origin. The multiple renal tumors were composed of “clear” epithelial cells indistinguishable from “clear cell” renal carcinoma. A cortical papillary adenoma lacking clear cells was also demonstrated.

Discussion

Panas and Remy first illustrated a retinal hemangioblastoma in 1879, but it was von Hippel who, in 1904, recognized the significance of the lesion and described its progression. Similarly, Pye-Smith's report of a cystic cerebellar hemangioblastoma was followed by others but was not synthesized into a coherent entity until Lindau's monograph in 1926 brought together the retinal, intracranial, and visceral elements. Lindau first included cerebellar and medulla oblongata hemangioblastomas, syringomyelia cavities, pancreatic cysts, renal cysts, and clear cell tumors; he later added epididymal cysts.

Bielschowsky published the first acceptable case of cerebral hemangioblastoma, but it was not until Hoff and Ray's report that this was linked with von Hippel-Lindau disease. Wright described a hemangioblastoma of a lumbar spinal nerve root. Other clinical features described include erythrocytosis and phaeochromocytoma.

The case reported here demonstrates many of the features that constitute von Hippel-Lindau disease. The patient had a mixed solid and cystic hemangioblastoma of the vermis as well as a solid lesion in the area postrema of the medulla oblongata. Both of these sites are common locations of hemangioblastoma. A syringobulbia was present, and both eyes demonstrated the von Hippel lesion. It is interesting that the only one of these signs that was clinically apparent appeared 13 years after he was first seen. This progression of the retinal lesions as well as that of the cerebellar lesions is well documented. We consider that this is a true hemangioblastoma of the pituitary gland.

We do not think that the cerebral lesion can be accepted as a hemangioblastoma on histological grounds despite the other multiple lesions; rather, we classify this as a vascular hamartoma. The pancreatic and renal lesions are those of Lindau's disease. The patient demonstrated erythrocytosis consistently from 1964 to the time of death. This must be considered a feature of the syndrome, especially since Skultety, et al., demonstrated high concentrations of erythropoietin.
in the solid component of their cerebellar hemangioblastoma.

Surgical removal of the lesion was not attempted in 1964 since the radiological appearances could not be differentiated from an arteriovenous malformation and other stigmata were not apparent at that time.

Acknowledgments

The authors are indebted to Dr. Kevin Bleasel, Dr. Vincent Munro and Dr. Michael Harrison for their assistance in the preparation of this report.

References


Address reprint requests to: Noel G. Dan, F.R.A.C.S., Department of Neurosurgery, St. Vincent’s Hospital, Sydney, Australia.