Atrial Myxoma Occurring 15 Years After Subtotal Resection of Cerebellar Hemangioblastoma
—Case Report—

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Abstract

A 51-year-old female, with a past medical history of resection of cerebellar hemangioblastoma, presented with an atrial tumor detected by sonography after undergoing a series of examinations for fever of unknown origin and subsequent symptoms of heart failure. After removing the atrial tumor, the histological findings demonstrated myxoma. Immunohistopathological study showed that the tumor cells in both the hemangioblastoma and the myxoma had strong cytoplasmic immunoreactivity for vascular endothelial growth factor. Hemangioblastoma associated with myxoma is extremely rare, and was probably a random occurrence in this case.

Key words: von Hippel-Lindau disease, hemangioblastoma, atrial myxoma

Introduction

Both cerebellar hemangioblastoma and cardiac myxomas are rare tumors. We describe a case of atrial myxoma which occurred 15 years after subtotal resection of cerebellar hemangioblastoma.

Case Report

A 51-year-old female was transferred to our hospital with an atrial tumor identified by sonography after undergoing a series of examinations due to a 3-week history of fever of unknown origin and subsequent symptoms of heart failure. She had a past medical history of subtotal resection of a cerebellar hemangioblastoma with ventriculoperitoneal shunt, and postoperative irradiation (0.5 Gy) for the residual tumor 15 years previously, and additional partial resection and release of an adherent cyst 14 years previously (Figs. 1 and 2). After the second operation, she was independent with mild grade dizziness. Her father had suffered from esophageal cancer and her mother had suffered stroke.

On arrival, she was well oriented. Her vital signs were as follows: blood pressure, 98/56 mmHg; pulse rate, 86/min; and axillary temperature, 37.4°C. She had diastolic rumbles in the chest and low-grade pretibial pitting edema. Biochemical analyses of the blood and urine were as follows: white blood cell count 9700/µl, platelet 469 000/µl, hemoglobin 8.3 g/dl (mean corpuscular volume 90 fl, mean corpuscular hemoglobin 27.6 pg, mean corpuscular hemoglobin concentration 30.6%), total bilirubin 0.5 mg/dl, aspartate aminotransferase 28 IU/l, alanine aminotransferase 30 IU/l, creatinine 0.9 mg/dl, and sodium 130 mEq/l.
transferase 34 IU/l, total protein 6.8 g/dl, glucose 119 mg/dl, blood urea nitrogen 8 mg/dl, creatinine 0.69 mg/dl, sodium 141 mEq/l, potassium 3.8 mEq/l, chloride 104 mEq/l, creatine phosphokinase 17 IU/l, C-reactive protein 14.1 mg/dl, urinary sugar (−), urinary blood (−), urinary protein (+). The urinary sediment was within the normal limits. A test for human immunodeficiency virus (HIV) was negative.

Chest radiography and electrocardiography found no abnormalities. Ultrasonography of the heart revealed a round mass of 34 mm diameter in the right atrium (Fig. 3). Ultrasonography of the abdomen found no abnormalities. A blood culture showed α-hemolytic streptococcus infection. These findings suggested the presence of infectious endocarditis with bacteremia, and secondary anemia and thrombocytopenia due to chronic infection. Cerebral magnetic resonance angiography detected no pseudoaneurysms. The infection could not be controlled despite infusing 24 000 000 units benzylpenicillin potassium per day. The atrial tumor was removed by open heart surgery on the 17th hospital day. Infusion of appropriate antibiotics finally controlled the infection. The histological findings demonstrated infectious myxoma (Fig. 4). She was discharged on foot on the 42nd hospital day.

Immunohistopathological study after discharge showed that the tumor cells in both the hemangioblastoma and the myxoma had strong cytoplasmic immunoreactivity for vascular endothelial growth factor (VEGF). No mutation of the von Hippel-Lindau (VHL) tumor suppressor gene was detected by the direct sequencing method, which has an accuracy of detection of approximately 70%.

Discussion

Hemangioblastoma associated with myxoma is extremely rare with no previously reported cases. The co-occurrence of these two tumors may be a random event. A brain tumor is rarely associated with another tumor in a different intracranial region or extracranial organ.13) The Japan autopsy registry contains 329 705 autopsy cases from 1975 to 1984, but only 123 cases (0.037%) of double cancers and 12 cases (0.0036%) of triple cancers included a primary brain tumor.9) Other sites for primary cancers include the thyroid (23%), the stomach (15%), the lungs (12%), and the colon (10%).9)

The co-occurrence of these two tumors could be associated with immunosuppressed condition. Patients infected with HIV frequently demonstrate Kaposi’s sarcoma and lymphoma.6,13) Children who undergo chemotherapy and/or radiotherapy tend to develop leukemia, breast cancer, soft tissue sarcoma, non-Hodgkin lymphoma, myelodysplastic syndrome, basal cell carcinoma, malignant melanoma, Kaposi sarcoma, high-grade neuroectodermal

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tumor, and meningioma.\textsuperscript{2,4} Our patient had undergone focal irradiation for residual tumor as an adult, but was not HIV positive. The second tumor was not one of the common types mentioned above.

The co-occurrence of two tumors could depend on inherited tumor susceptibility syndromes. Patients with retinoblastoma, familial adenomatous polyposis, juvenile polyposis syndromes, VHL disease, multiple endocrine neoplasia, and Li-Fraumeni syndrome or neurofibromatosis tend to develop multiple tumors.\textsuperscript{5,11} Cerebellar hemangioblastoma is known to occur in VHL disease, which is an inherited multisystem cancer syndrome associated with germline mutation of the VHL tumor suppressor gene on the short arm of chromosome 3.\textsuperscript{1,11}

The diagnosis of VHL disease is often based on clinical criteria. Patients with a family history, and the presence of a central nervous system (CNS) hemangioblastoma, pheochromocytoma, or clear cell renal carcinoma meet the diagnostic criteria.\textsuperscript{11} Patients with a relevant family history must have two or more CNS hemangioblastomas, or one CNS hemangioblastoma and a visceral tumor.\textsuperscript{11} The occurrence of multiple tumors in VHL syndrome may be based on over-expression of VEGF caused by absent VHL protein function,\textsuperscript{10} so the diagnostic criteria of visceral tumors in VHL syndrome could be extended to include cardiac myxoma as a visceral tumor, but the expression of VEGF is up-regulated in a large proportion of human malignant tumors.\textsuperscript{9} The present patient had no particular family history, the atrial myxoma is not included in the diagnostic criteria of visceral tumor in VHL syndrome, and no mutation of the VHL tumor suppressor gene was detected.

The present case of association of cerebellar hemangioblastoma and atrial myxoma was probably a random occurrence with no causative mechanism.

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References


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