Lhermitte-Duclos Disease Associated with Cowden's Disease
—Case Report—

Hiroshi YUASA, Takashi MOTOKISHITA, Sumitaka TOKITO, Masayoshi TOKUNAGA*, and Masamichi GOTO**

Departments of Neurosurgery and *Pathology, Kagoshima City Hospital, Kagoshima; **2nd Department of Pathology, Kagoshima University School of Medicine, Kagoshima

Abstract

A 49-year-old Japanese male with Lhermitte-Duclos disease subsequently developed a very rare association with Cowden's disease. Partial tumor removal established the diagnosis of Lhermitte-Duclos disease. Follow-up examinations discovered the presence of Cowden's disease. Long-term follow-up of patients with Lhermitte-Duclos disease is essential to identify signs of Cowden's disease, which carries the risk of developing malignancy.

Key words: Lhermitte-Duclos disease, cerebellar tumor, magnetic resonance imaging, polyposis, Cowden's disease

Introduction

Lhermitte-Duclos disease is a rare disorder of the cerebellum characterized by enlarged cerebellar folia containing abnormal ganglion cells, first described in 1920. It usually presents as a cerebellar mass lesion with headaches, ataxia, and visual disturbances. Cowden's disease was first described in 1963. It is transmitted in an autosomal dominant pattern and is characterized by multiple hamartomatous neoplasms of ectodermal, mesodermal, and endodermal origin. The simultaneous occurrence of Lhermitte-Duclos disease and Cowden's disease is rare, with only 12 cases previously reported. We describe a patient with Lhermitte-Duclos disease who subsequently developed Cowden's disease.

Case Report

A 49-year-old Japanese male was admitted on November 4, 1983 because of clumsiness of the right hand. His past medical history was unremarkable except for polyposis of the esophagus and the stomach identified at a check-up in September 1982. Physical examination found his head circumference was large, measuring 61 cm. Neurological examination demonstrated intention tremor, adiadochokinesis, and unskillful finger-nose test on the right side. Computed tomography (CT) of the head revealed moderate ventriculomegaly and a low density mass in the vermis and the right cerebellar hemisphere, which was not enhanced following intravenous administration of contrast medium (Fig. 1). The tumor was partially removed on November 16, 1983. The histological findings indicated Lhermitte-Duclos disease (Fig. 2). The postoperative course was uneventful with resolution of the neurological deficits. Radiography and endoscopy of the alimentary tract for further evaluation of the polyposis disclosed multiple polyps in the esophagus, stomach, sigmoid colon, and rectum. Histological examination of the biopsy specimens from several polyps in each affected organ showed all were inflammatory polyps. He was discharged on December 16, 1983, and followed up as an outpatient.

Magnetic resonance (MR) imaging on December 1, 1993 demonstrated a nonenhanced mass in the right cerebellar hemisphere and the vermis appearing as hypointense on the T1-weighted images and hyperin-
tense on the T2-weighted images, and containing linear bands (Fig. 3). Examination on February 16, 1994 found he was neurologically intact. However, he stated that he had had a tumor removed from his tongue in March 1990 which was reported to be a fibroepithelial polyp. Physical examination then disclosed several papules on the dorsal aspects of both wrists and hands (Fig. 4) and a polyp on the right lateral margin of the tongue (Fig. 5). The diagnosis was Cowden’s disease in association with Lhermitte-Duclos disease. There was no family history of skin diseases or gastrointestinal polyposis or a brain tumor. One of his sons had undergone surgery for a congenital cyst of the liver at the age of 6 years. When last seen on February 6, 1995, he was neurologically asymptomatic with no change in the papules and the polyp of the tongue. Follow-up CT and MR imaging showed no further growth of the residual tumor in the cerebellum.

**Discussion**

CT shows Lhermitte-Duclos disease as a hypodense to isodense nonenhanced mass in the cerebellum with or without calcifications.\(^3,7,9,12,14-19,22,23,27,28,30\) MR imaging typically shows a nonenhanced mass which is slightly hypointense on the T1-weighted images and hyperintense on the T2-weighted images, with a characteristic striated pattern thought to represent thickened cerebellar

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**Fig. 1** Preoperative axial computed tomography showing a low density mass in the vermis and the right cerebellar hemisphere.

**Fig. 2** Photomicrographs showing an enlarged folia in the cerebellar cortex with a thickened molecular layer, modified granular layer with abnormal cells, and laminated central core (upper: HE stain, ×18), and the layer of hypertrophic neurons (lower: Nissl stain, ×180).

**Fig. 3** Postoperative axial T1-weighted magnetic resonance image demonstrating a hypointense mass with linear bands in the vermis and the right cerebellar hemisphere (left), and axial T2-weighted magnetic resonance image showing a high-signal mass with linear bands (right).
Surgical resection, with ventricular shunting if necessary, is the treatment of choice. Diagnostic criteria for Cowden’s disease have been proposed based on 45 reported cases. Our case fulfilled the criteria of oral mucosal papillomatosis and acral keratoses. An extensive review of 100 cases identified four common mucocutaneous abnormalities providing important clues to the diagnosis, including multiple facial papules, acral keratoses, palmoplantar keratoses, and multiple oral papillomas. Hamartomas and other system tumors included thyroid tumor (goiter, adenoma, and carcinoma), fibrocystic disease, and carcinoma of the female breast, tumors of the female genitourinary system, and gastrointestinal polyps. Enlarged head circumference was found in 70% of 21 cases. The histological findings of the gastrointestinal polyp in Cowden’s disease are juvenile, lymphomatous, hamartomatous, hyperplastic, inflammatory, and adenomatous types.

Lhermitte-Duclos disease is frequently associated with megalencephaly, megaloocephaly, hydrocephalus, heterotopia, and hydromyelia, and more rarely with polydactyly, neurofibromatosis, mental retardation, spongioblastoma, multiple hemangio- mas, partial gigantism, dysplastic body, metastatic perithelioma, hyperplastic tongue, and seizures. Familial association in a mother and her son has been reported. Lhermitte-Duclos disease associated with Cowden’s disease has been reported in 12 patients since 1981. Another patient had Lhermitte-Duclos disease and conditions suggestive of Cowden’s disease. The association of the two diseases may belong to a new phakomatosis based on the rarity of the two diseases and their similar nature. This hypothesis has been supported by many authors. Review of the reported cases of Lhermitte-Duclos disease associated with Cowden’s disease suggested that Cowden’s disease is a phakomatosis and that Lhermitte-Duclos disease may be a part of the phakomatosis or an isolated disease.

Patients with Cowden’s disease should undergo clinical and neuroradiological examinations for Lhermitte-Duclos disease and patients with Lhermitte-Duclos disease should be carefully examined and followed up for Cowden’s disease because of the associated risk of malignancy.

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References

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Address reprint requests to: H. Yuasa, M.D., Department of Neurosurgery, Kagoshima City Hospital, 20-17 Kajiya-cho, Kagoshima 892, Japan.