Temporal Lobe Epilepsy Caused by Dermoid Cyst

—Case Report—

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admission. Memory disturbance was not noticed by the patient, but a battery of neuropsychological tests demonstrated moderate decrease in verbal memory.

Computed tomography demonstrated abnormal areas consisting of two components, a low density cystic area and a high density solid area, in the medial portion of the left temporal lobe (Fig. 1A). T1-weighted magnetic resonance (MR) imaging also revealed two components as hypointense and hyperintense areas partially enhanced by gadolinium-diethylenetriaminepenta-acetic acid (Fig. 1B, C). The tumor appeared as a heterogeneous hyperintense area on T2-weighted, fluid-attenuated inversion recovery, and diffusion-weighted images. The tumor was well demarcated from the brain parenchyma, but the boundary with the amygdala was not so clear. The tumor was $30 \times 20 \times 40$ mm. There was no abnormal signal intensity in the subarachnoid space or the ventricle near the tumor. Single photon emission computed tomography with N-isopropyl-p-$^{123}$I]iodoamphetamine showed a reduced regional cerebral blood flow in the medial area of the left temporal lobe. Our preoperative diagnosis was dermoid tumor manifesting as complex partial seizures caused by irritation of the mesial temporal area.

Scalp electroencephalography detected interictal epileptiform discharges in the central and frontal areas more dominant on the left. Although epileptiform discharges in the temporal area were not so prominent, sporadic small sharp waves were detected in the middle and posterior temporal areas.

A left frontotemporal craniotomy exposed a well-demarcated tumor deep in the sylvian fissure, but the boundary with the adjacent amygdala was not clear. The tumor was dark yellow on the surface (Fig. 2). Hairs were found inside the tumor during intratumor decompression. The tumor and the surrounding gliotic area including the amygdala were completely resected. Intraoperative ECoG over the surface of hippocampus clearly detected sporadic interictal spikes over the anterior segment of the hippocampus (Fig. 3). The hippocampal epileptic region was treated by transection of the pyramidal layer for preservation of verbal memory.9

Histological examination demonstrated calcification, cholesterol crystals, hair and hair bulb, degenerated sebaceous glands, and foreign giant cells. These findings were compatible with the diagnosis of dermoid cyst (Fig. 4). His seizures have been completely arrested in the 2 years since the admission.
surgery. Postoperative neuropsychometry demonstrated that the patient had preserved his preoperative level of memory function.

**Discussion**

A review of 44 cases of dermoid cysts found that tumors in the temporal lobe region accounted for 13.6% of all intracranial dermoid cysts. Dermoid cyst manifested as headache in 31.8% of patients, of whom 29.5% had seizures. Common neurological symptoms like headache and seizures may be caused by rupture of dermoid cyst.\(^{6,10-13}\)

MR imaging can clearly reveal rupture of dermoid cyst.\(^{5,6,11,13}\) Fat intensity within the ventricle and subarachnoid space, and sulcal widening by liquefied fat are pathognomonic signs of ruptured intracranial dermoid cyst. After rupture, the fat intensity in the cerebrospinal fluid space remains high for a long time.\(^{13}\) MR imaging found no such indications in our patient, and so he did not have a ruptured dermoid cyst. Seizures are common secondary symptoms in patients with intracranial dermoid tumors, but generalized complex seizures are the most common type in reported cases.\(^{1,2,5,10,11}\)

Dermoid cysts in the temporal region rarely cause complex partial seizures. Intracranial dermoid cyst was associated with complex partial seizures in only one case.\(^{2}\)

Intraoperative ECoG demonstrated interictal spikes in both the regions around the tumor and over the hippocampal head. Despite the tumor location away from the hippocampus, epileptic activity was recorded in the anterior part of the hippocampus. Complete seizure arrest was achieved by transection of the pyramidal layer of the affected hippocampus. This new surgical technique preserved the patient’s verbal memory function.

Dermoid tumors in the temporal region manifesting as complex partial seizures are extremely rare. The important observation is that the hippocampus can acquire epileptogenicity even if the tumor does not directly involve the hippocampus. We strongly recommend intraoperative ECoG of the mesial temporal structures to determine the exact extent of epileptic areas. Although total resection of the tumor is mandatory, complete treatment of the epileptic area around the tumor under ECoG guidance is also very important to control the seizures.

**References**

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Neurol Med Chir (Tokyo) 46, April, 2006


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