History
Teenage male with incidental "cyst" on CT of the brain obtained after trauma

Diagnosis
Thalamic infarct with mamillothalamic tract atrophy and cortical dysplasia

Discussion
Ipsilateral fornical atrophy is observed after tuberothalamic artery infarction, which usually arises from the middle third of the posterior communicating artery. Infarction in this territory involves the anterior thalamus, including the mamillothalamic tract, and is frequently accompanied by neuropsychiatric disturbance. The fornical atrophy is presumably secondary to transsynaptic degeneration after disruption of the mamillothalamic tract by the anterior thalamic infarction. FCD was first described in 1971 by Taylor et al as a distinct subtype of malformation of cortical development. Unlike other MCDs—which include pachgyria, polymicrogyria, and hemimegalencephaly—FCD is not associated with diffuse abnormal gyration, but rather with subtle focal changes that at times can only be appreciated microscopically. Similar to other MCDs, FCD is thought to be secondary to genetic, ischemic, toxic, or infectious insult during cortical development. There are two major subdivisions of FCD. Type I FCD= dyslamination of the cortical layer compared with the normal cortex. Type II FCD= cortical dyslamination and dysmorphic neurons. At clinical examination, patients with mild cortical dysplasia or type I FCD may or may not have epilepsy. Occasionally, these patients are entirely asymptomatic or may have learning disorders. Most patients with type II FCD have medically refractory epilepsy. Current imaging techniques that make use of MR imaging, magnetic source imaging, or FDG PET are unable to reliably help differentiate between mild MCD, type I FCD, and type II FCD. Some characteristic MR imaging findings of FCD include focal cortical thickening, blurring of the gray matter–white matter junction, and gray matter T2 hyperintensity.

Findings
Circumscribed encephalomalacia in the left thalamus with ipsilateral forniceal atrophy and absent mammillary body consistent with a remote insult.
Subtle blurring of the gray white junction in the right central gyrus with a streak of hyperintense signal extending from this region to the ventricle.

Reference
Neuroimaging in Pediatric Epilepsy: A Multimodality Approach
Sachin Rastogi, MD, Christopher Lee, MD and Noriko Salamon, MD July 2008 RadioGraphics, 28, 1079-1095.
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