MR of Reversible Thalamic Lesions in Wernicke Syndrome

John F. Donnal,1 E. Ralph Heinz,1 and Peter C. Burger2

Wernicke syndrome is a disease of thiamine deficiency. The clinical and pathologic manifestations are known but imaging reports are sparse. We present a patient with Wernicke syndrome whose MR studies showed thalamic lesions associated with the disease. Resolution of these lesions followed vitamin therapy and paralleled clinical improvement.

Case Report

A 68-year-old alcoholic woman was brought to the emergency room by her son who reported severe lethargy and bizarre behavior. She was apathetic, with flat speech and marked latency to questions and commands. She had fixed vertical nystagmus, could not sit or walk, and was dysmetric. CSF examination was normal. A clinical diagnosis of Wernicke encephalopathy was proposed. An MR image was obtained on the day of admission, prior to the institution of vitamin therapy and found all to be abnormal. The most common gross pathologic findings were mamillary body atrophy (74%), vermian atrophy (36%), and cerebral atrophy (27%). Microscopic disease was present in all mamillary bodies (100%) and most thalami (89%). The dorsal medial nuclei were affected in 88% of involved thalami; other thalamic nuclei were affected less often. Lesions were observed frequently at the midbrain, especially the ocoulomotor nucleus. Histopathology at affected sites ranged from nearly complete tissue necrosis to presence of reactive glial cells and mild neuronal and myelin destruction. In the most minimally diseased foci, only proliferation of astrocytes and prominence of blood vessels were observed, with intact neurons and myelin.

Imaging findings of Wernicke syndrome have been reported. In one study, sagittal MR scanning consistently demonstrated mamillary body atrophy, with seven of nine patients having smaller mamillary bodies than did controls. The less specific finding of global atrophy was often found. Importantly, mamillary atrophy was considered relatively more prominent than the cerebral atrophy. CT scanning in a case strikingly similar to ours was described by McDowell and LeBlanc. A 45-year-old woman with florid Wernicke-Korsakoff syndrome had bilateral low-density lesions in the dorsal medial nuclei of the thalami, which partially regressed with treatment. Drayer et al. reported increased signal on T2-weighted images at the thalami of patients with Wernicke syndrome, along with increased signal at other deep gray structures. These changes were associated with mamillary body and cerebellar vermian atrophy.

Mamillary body atrophy is an irreversible marker of chronic Wernicke syndrome caused by tissue destruction. It is best assessed in the sagittal or coronal planes. Frequently, these bodies are not well seen on axial scans because they are lost in partial volume with the suprasellar cistern. Pathologic ma-

Received January 2, 1990; revision received February 5, 1990; revision received March 6, 1990; accepted March 12, 1990.

1 Department of Radiology, Duke University Medical Center, Box 3808, Durham, NC 27710. Address reprint requests to J. F. Donnal.
2 Department of Pathology, Duke University Medical Center, Durham, NC 27710.
Lesions at dorsal medial nuclei (arrows) are better visualized on first echo (A) (2800/30) than on second echo (B) (2800/80) of T2-weighted pulse sequence. Third ventricle appears compressed.

C, Schematic of A. The dorsal medial nucleus (DM) can be identified at this level lying ventral to the pulvinar (P) and lateral to the third ventricle (III).

Fig. 1.—Fig. 2.—T2-weighted (2800/30) MR image after vitamin treatment and clinical improvement shows near total resolution of thalamic lesions. The third ventricle is larger than on initial scan.

Fig. 3.—Coronal pathologic section (from archives) demonstrates typical necrosis at dorsal medial nucleus of thalamus (straight arrow) and at mamillary bodies (curved arrow) in a patient who died of acute Wernicke syndrome.

REFERENCES

The reader’s attention is directed to the commentary on this article, which appears on the following pages.