Utility of Oblique Coronal Images in Elderly and Cognitively Impaired Patients

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Dear Editor,

The ongoing and rapid increase in the number of elderly people in Korea has led to an increasing number of cognitive problems among this population.¹ A nationwide survey has estimated the prevalence rates of mild cognitive impairment (MCI) and dementia among Koreans aged at least 65 years to be 24.1% and 8.1%, respectively.² The number of dementia patients is expected to double every 20 years until 2050.²

Alzheimer's disease (AD) is the most common cause of MCI and dementia.^{1,2} Since medial temporal atrophy (MTA) occurs early and prominently in patients with AD,³ a 5-point scoring system has been developed to rate the severity of the condition, from grade 0 (no MTA) to grade 4 (severe MTA).⁴ This scoring system is applied to oblique coronal T1-weighted images that are obtained parallel to the brainstem axis (Fig. 1).⁴ It is known that the medial temporal anatomy is visualized better in coronal images than in axial images.⁵ Visual rating of MTA based on coronal images has been used as a reliable marker for AD since its introduction more than 20 years ago.⁶ Although a visual rating system for MTA using T1-weighted axial images was developed recently,⁷ it has not been used in other studies.

Fig. 1. Medial temporal atrophy (MTA) on oblique coronal T1-weighted images. Examples of oblique coronal T1-weighted images demonstrating MTA from grade 0 (no MTA) to 4 (severe MTA). All the examples are from the left hemisphere, as shown in the white box.

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The Neuroimaging Work Group of the Alzheimer's Association also recommended the use of coronal T1-weighted images for assessing MTA.⁸

Oblique coronal scans are often not included in the routine MRI protocol in Korea, and as a consequence many elderly patients who are referred to our center only have brain MRI scans in the axial or sagittal plane (i.e., not in the oblique coronal plane). We have reviewed a consecutive series of 759 MRI examinations of patients aged at least 65 years who visited the Neurocognitive Behavioral Center of Seoul National University Bundang Hospital (SNUBH) between July 2013 and March 2014 due to neurodegenerative disorders. Among them, 667 examinations were performed using MRI scanners at SNUBH, and 92 examinations were performed using MRI scanners at other hospitals. A total of 193 examinations did not include the oblique coronal images: 158 out of 667 examinations (23.7%) at SNUBH and 35 out of 92 examinations (38.0%) at other hospitals.

Visual rating of MTA obtained from oblique coronal images is a valuable tool for diagnosing and predicting cognitive impairment. The authors suggest that oblique coronal scans should be obtained when brain MRI is being performed to investigate cognitive impairment. Given the growing prevalence of cognitive impairment among elderly Koreans, when brain MRI is requested for elderly patients aged at least 65 years it is prudent to take a history pertaining to cognitive decline and to consider obtaining oblique coronal images even if cognitive impairment is not the main reason for per-

forming the procedure.

Conflicts of Interest

The authors have no financial conflicts of interest.

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