RESIDENT & FELLOW SECTION

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Mystery Case: Injuries of neural tracts in the Papez circuit following anterior thalamic infarction

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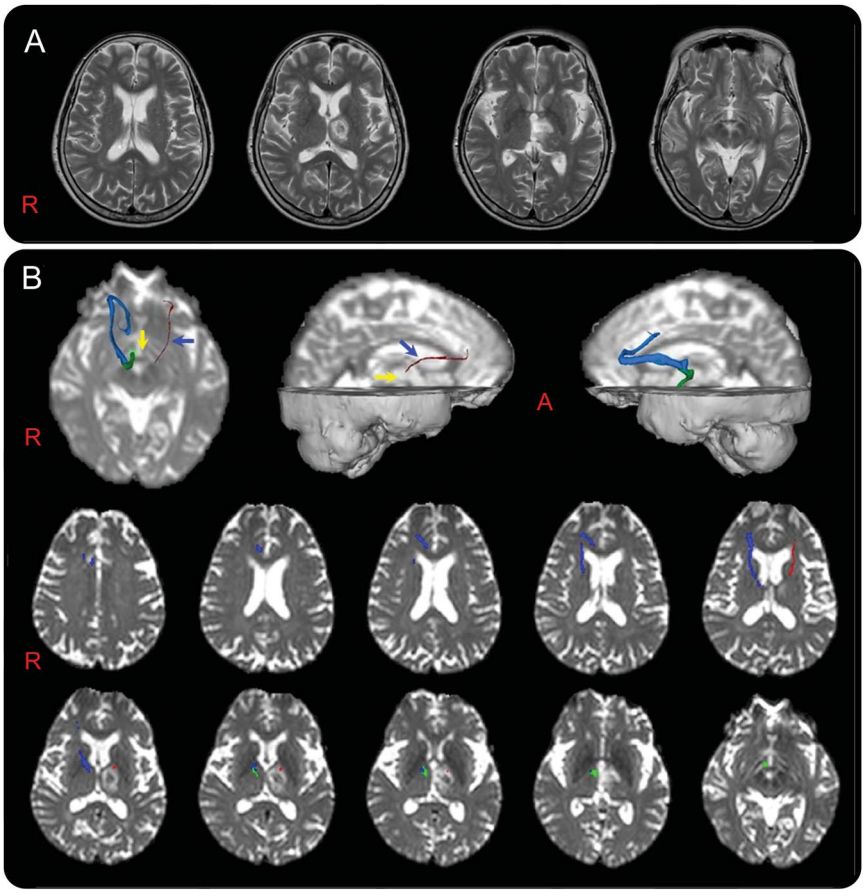
Figure T2-weighted brain MRI and results of diffusion tensor tractography



(A) T2-weighted brain MRI shows the left anterior thalamic infarction. (B) The thalamocortical tract between the anterior thalamic nuclei and the cingulate gyrus in the left hemisphere shows thinning compared with that of the right hemisphere (blue arrow). In addition, the left mammillothalamic tract was not reconstructed (yellow arrow).

An 80-year-old woman received conservative management for an infarct in the anterior thalamus (figure, A). She had shown severe memory impairment since the onset of infarction. Diffusion tensor tractography at 2 weeks after onset showed that the thalamocortical tract between the anterior thalamic nuclei and the cingulate gyrus and the mammillothalamic tract were reconstructed in the right hemisphere.[1,2] By contrast, the left thalamocortical tract showed thinning compared with that of the right hemisphere and the left mammillothalamic tract was not reconstructed. This patient's memory impairment was mainly the result of injuries of these tracts in the Papez circuit.[1,2]

AUTHOR CONTRIBUTIONS

Sung Ho Jang: drafting/revising the manuscript, study concept or design, accepts responsibility for conduct of research and final approval, study supervision, obtaining funding. Jun Lee: study concept or design, accepts responsibility for conduct of research and final approval, acquisition of data. Hyeok Gyu Kwon: drafting/revising the manuscript, analysis or interpretation of data, accepts responsibility for conduct of research and final approval, statistical analysis.

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Go to Neurology.org for full disclosures. Funding information and disclosures deemed relevant by the authors, if any, are provided at the end of the article.

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DISCLOSURE

The authors report no disclosures relevant to the manuscript. Go to Neurology.org for full disclosures.

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2. Jang SH, Yeo SS. Thalamocortical tract between anterior thalamic nuclei and cingulate gyrus in the human brain: diffusion tensor tractography study. Brain Imaging Behav 2013;7:236–241.

MYSTERY CASE RESPONSES

The Mystery Case series was initiated by the *Neurology*® Resident & Fellow Section to develop the clinical reasoning skills of trainees. Residency programs, medical student preceptors, and individuals were invited to use this Mystery Case as an educational tool. Responses were solicited through a group e-mail sent to the American Academy of Neurology Consortium of Neurology Residents and Fellows and through social media.

All the responses that we received came from individuals rather than groups. A total of 50% of respondents correctly identified the left thalamic infarction in the figure, A, and the loss of the left mammillothalamic tract on diffusion tensor tractography in the figure, B.

This case report demonstrates the utility of tractography in assessing the integrity of neural pathways, such as the Papez circuit, which are not directly visualized with other imaging modalities such as CT or conventional MRI.

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