

# Teaching Video NeuroImage: Reversible Parkinsonism Caused by Lumboperitoneal Shunt Overdrainage

Hajime Takeuchi, MD, Katsuhisa Masaki, MD, PhD, Hidenori Ogata, MD, PhD, Satoshi Nagata, MD, Takafumi Shimogawa, MD, PhD, Ryo Yamasaki, MD, PhD, and Noriko Isobe, MD, PhD

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## Correspondence

Dr. Isobe,  
isobe.noriko.342@  
m.kyushu-u.ac.jp

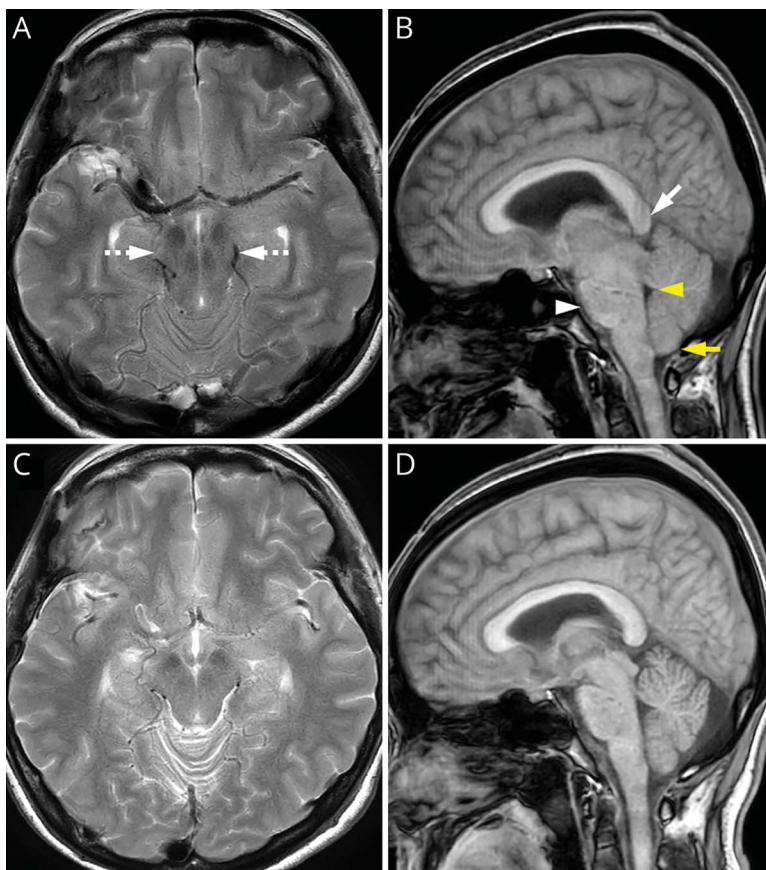
**Figure 1** Brain MRI

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Initial axial T2-weighted imaging (A) and sagittal T1-weighted imaging (B) show marked midbrain compression (dashed arrows), brainstem sagging (arrowhead), inferior drooping of the splenium (arrow), narrowing of the fourth ventricle (yellow arrowhead), and cerebellar tonsillar herniation (yellow arrow). (C, D) After shunt pressure adjustment, structures around the brain stem recovered.

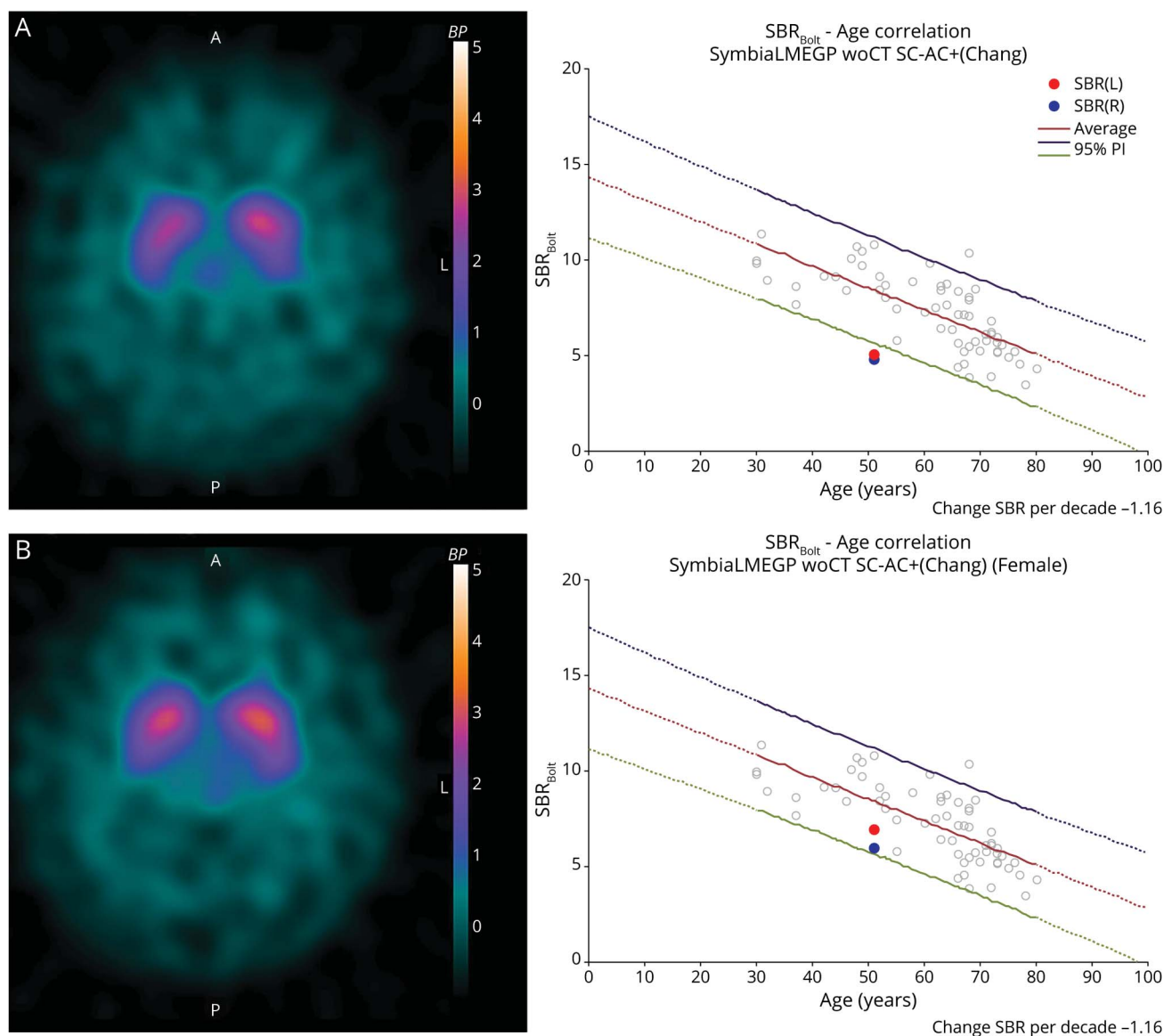
## Case

A 51-year-old woman presented with apraxia of eyelid opening, followed by slowly progressive masked facies, tongue tremor, dysphagia, neck and upper extremity rigidity, and bradykinesia 6 months after lumboperitoneal shunt placement for hydrocephalus after subarachnoid hemorrhage. An MRI examination of the brain showed midbrain compression,

From the Departments of Neurology (H.T., K.M., H.O., S.N., R.Y., N.I.), Neurological Institute, Graduate School of Medical Sciences, Kyushu University; and Department of Neurosurgery (T.S.), Neurological Institute, Graduate School of Medical Sciences, Kyushu University.

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**Figure 2**  $^{123}\text{I}$ -Ioflupane SPECT



Initial SPECT (A) demonstrates impaired dopamine transporter binding in the bilateral striata, which recovered after shunt pressure adjustment (B). The SBR (specific binding ratio) values were obtained using the Tossi-Bolt method ( $\text{SBR}_{\text{Bolt}}$ ). Red lines represent the mean SBR by age and purple and green lines the 95% upper and lower prediction intervals.

brainstem displacement inferiorly, and cistern effacement, consistent with infratentorial hypotension.  $^{123}\text{I}$ -ioflupane SPECT imaging showed reduced striatal dopamine transporter binding bilaterally. All symptoms and findings ameliorated after increasing shunt pressure (Figures 1 and 2 and Video 1). UPDRS Part III score improved from 24 to 5. Intracranial hypotension with midbrain sagging can cause reversible parkinsonism<sup>1,2</sup> when displacement shear forces impair the nigrostriatal dopamine pathway.

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## Appendix Authors

Name	Location	Contribution
<b>Hajime Takeuchi, MD</b>	Departments of Neurology, Neurological Institute, Graduate School of Medical Sciences, Kyushu University	Drafting/revision of the article for content, including medical writing for content; major role in the acquisition of data; study concept or design; and analysis or interpretation of data
<b>Katsuhisa Masaki, MD, PhD</b>	Departments of Neurology, Neurological Institute, Graduate School of Medical Sciences, Kyushu University	Drafting/revision of the article for content, including medical writing for content; major role in the acquisition of data; study concept or design; and analysis or interpretation of data
<b>Hidenori Ogata, MD, PhD</b>	Departments of Neurology, Neurological Institute, Graduate School of Medical Sciences, Kyushu University	Drafting/revision of the article for content, including medical writing for content; major role in the acquisition of data; study concept or design; and analysis or interpretation of data

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## Appendix (continued)

Name	Location	Contribution
<b>Satoshi Nagata, MD</b>	Departments of Neurology, Neurological Institute, Graduate School of Medical Sciences, Kyushu University	Drafting/revision of the article for content, including medical writing for content; analysis or interpretation of data
<b>Takafumi Shimogawa, MD, PhD</b>	Department of Neurosurgery, Neurological Institute, Graduate School of Medical Sciences, Kyushu University	Analysis or interpretation of data; additional contributions: patient care (shunt adjustment)
<b>Ryo Yamasaki, MD, PhD</b>	Departments of Neurology, Neurological Institute, Graduate School of Medical Sciences, Kyushu University	Drafting/revision of the article for content, including medical writing for content; analysis or interpretation of data
<b>Noriko Isobe, MD, PhD</b>	Departments of Neurology, Neurological Institute, Graduate School of Medical Sciences, Kyushu University	Drafting/revision of the article for content, including medical writing for content; study concept or design; and analysis or interpretation of data

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