Teaching NeuroImages: Reversible Parkinsonism Caused by Lumboperitoneal Shunt Overdrainage

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Neurology® Published Ahead of Print articles have been peer reviewed and accepted for publication.

This manuscript will be published in its final form after copyediting, page composition, and review of proofs. Errors that could affect the content may be corrected during these processes. Videos, if applicable, will be available when the article is published in its final form.
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Takafumi Shimogawa: Analysis or interpretation of data; Additional contributions: patient care (shunt adjustment)
Ryo Yamasaki: Drafting/revision of the manuscript for content, including medical writing for content; Analysis or interpretation of data
Noriko Isobe: Drafting/revision of the manuscript for content, including medical writing for content; Study concept or design; Analysis or interpretation of data

Figure Count:
2

Table Count:
0
Search Terms:

Acknowledgment:
We thank Rinako Shimada at Kyushu University and Edanz (https://jp.edanz.com/ac) for editing a draft of this manuscript.

Study Funding:
This study was funded by Grants-in Aid from the Research Committee of CNS Degenerative Diseases, Research on Policy Planning and Evaluation for Rare and Intractable Diseases, Health, Labour and Welfare Sciences Research Grants, the Ministry of Health, Labour and Welfare, Japan (Grant Number 20FC1049).

Disclosures:
The authors report no relevant disclosures.

Preprint DOI:

Received Date:
2022-02-24

Accepted Date:
2022-06-08

Handling Editor Statement:
Submitted and externally peer reviewed. The handling editor was Roy Strowd III, MD, Med, MS.
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 following subarachnoid hemorrhage. MRI showed midbrain compression, brainstem displacement inferiorly, and cistern effacement, consistent with infratentorial hypotension. $^{123}$I-ioflupane SPECT imaging showed reduced striatal dopamine transporter binding bilaterally. All symptoms and findings ameliorated after increasing shunt pressure (Figures and Supplementary Video). UPDRS Part III score improved from 24 to 5. Intracranial hypotension with midbrain sagging can cause reversible parkinsonism when displacement shear forces impair the nigrostriatal dopamine pathway.

Teaching Slides - http://links.lww.com/WNL/C179

Video 1 - http://links.lww.com/WNL/C180
References


Figure 1 Brain MRI

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 brainstem recovered.
Figure 2 $^{123}$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 Tossici-Bolt method ($\text{SBR}_{\text{Bolt}}$). Red lines represent average SBR by age, purple and green lines the 95% upper and lower prediction intervals.

Supplementary Video 1

Video demonstrating apraxia of eyelid opening and reduced arm swing during walking before shunt pressure adjustment. After shunt pressure adjustment, these findings were almost resolved.
Teaching NeuroImages: Reversible Parkinsonism Caused by Lumboperitoneal Shunt Overdrainage
*Neurology* published online July 8, 2022
DOI 10.1212/WNL.0000000000200994

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