Teaching NeuroImages: Reversible Parkinsonism Caused by Lumboperitoneal Shunt Overdrainage

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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$^{1,2}$ when displacement shear forces impair the nigrostriatal dopamine pathway.

Teaching Slides - [http://links.lww.com/WNL/C179](http://links.lww.com/WNL/C179)

Video 1 - [http://links.lww.com/WNL/C180](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 ($SBR_{\text{Bolt}}$). 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.
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