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Tremor and Other Hyperkinetic Movements

Case Report

Dual Treatment of Hemichorea–Hemiballismus Syndrome with Tetrabenazine and Chemodenervation

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Abstract

Background: Hemichorea–hemiballismus involves unilateral involuntary flailing movements and random jerking movements involving proximal or distal muscles. We describe a case of hemichorea–hemiballismus with dystonia after stroke. Treatment with tetrabenazine and chemodenervation produced beneficial responses. Effective treatment of both hemichorea–hemiballismus and dystonia due to stroke has not been reported.

Case Report: A 65-year-old male developed left hemichorea–hemiballismus and dystonia after a right hemisphere stroke. He underwent initial treatment with neuroleptics and anticonvulsants without improvement. Subsequent treatment with tetrabenazine improved the hemichorea–hemiballismus and chemodenervation reduced the dystonia.

Discussion: Hemichorea–hemiballismus associated with dystonia can be improved with both tetrabenazine and chemodenervation.

Keywords: Hemichorea–hemiballismus, dystonia, tetrabenazine, chemodenervation, onabotulinumtoxinA, hyperkinetic movements

Citation: Umeh CC, Nichols P, Rosenthal LS, et al. Dual treatment of hemichorea–hemiballismus syndrome with tetrabenazine and chemodenervation. Tremor Other Hyperkinet Mov 2012;2: http://tremorjournal.org/article/view/113

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Editor: Elan D. Louis, Columbia University, United States of America

Received: July 28, 2012 **Accepted:** September 4, 2012 **Published:** October 19, 2012

Funding: None.

Financial Disclosures: None.

Conflict of Interest: The authors report no conflict of interest.

Introduction

Hemichorea–hemiballismus (HCHB) is characterized by involuntary unilateral irregular flailing movements and continuous random jerking movements of proximal or distal muscles.[1,2] Cortical strokes have less commonly been described as an etiology of HCHB as most reported cases are due to subcortical strokes or from a metabolic cause such as hyperglycemia. In one study of 5,009 post-stroke patients, 27 patients developed hemichorea whereas only six of those patients had a cortical lesion.[3] Some individuals with HCHB also develop dystonia, and in such cases an effective treatment strategy is not yet established. We herein present a case of HCHB associated with dystonia after a right hemispheric stroke. The patient was treated with tetrabenazine and chemodenervation, with overall beneficial responses to both. The combination of these two treatment modalities for the management of HCHB with dystonia has not been formally described.

Case report

A 65-year-old male with a history of diabetes mellitus, chronic obstructive pulmonary disease, depression, and a right hemisphere stroke presented to the Johns Hopkins Movement Disorders Clinic for evaluation of left-sided involuntary hyperkinetic movements. The hyperkinetic movements began 3 months after a stroke involving the right posterior frontal lobe white matter and small cortical infarcts in the right temporal–frontal–parietal junction (Figure 1). On evaluation, he was noted to have distal choreic movements and proximal ballistic swings of moderate amplitude involving the left arm (Video Segment 1). The hyperkinetic movements were more pronounced with action and interfered with volitional left-sided movements. There was mild weakness of the left triceps and left tibialis anterior with mild increased left arm muscle tone. His sensory examination was normal. Based on his history and examination, he was diagnosed with post-stroke HCHB syndrome.

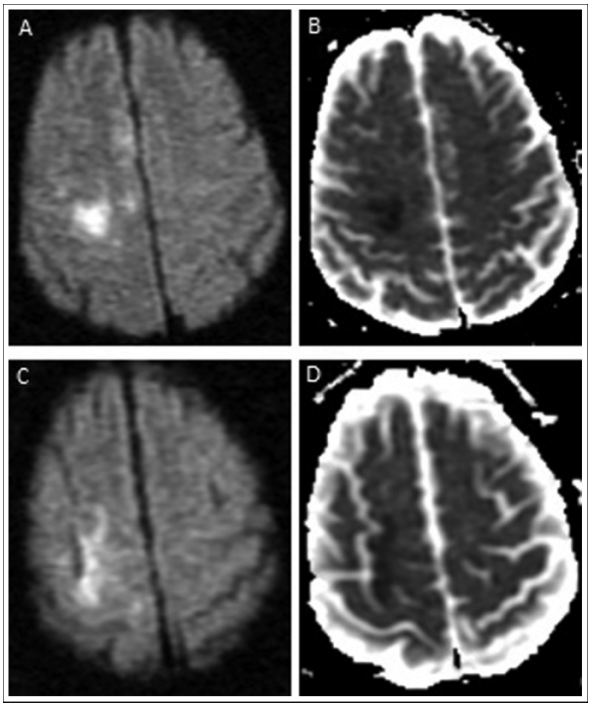
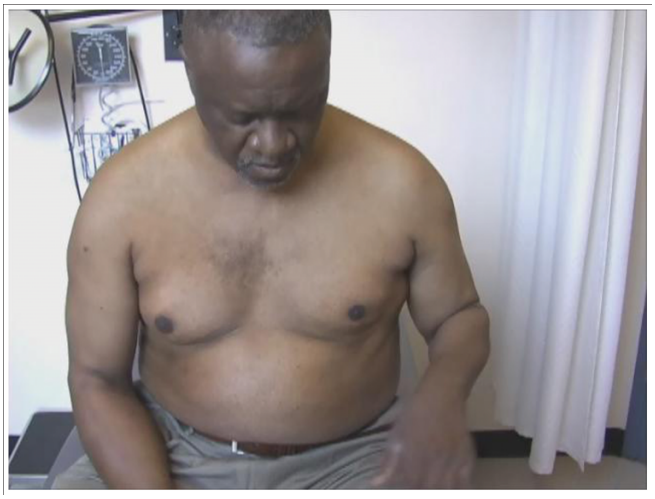


Figure 1. Magnetic Resonance Imaging of the Brain Showing Strokes in the Right Cerebral Hemisphere. Diffusion-weighted (A, C,) and corresponding apparent diffusion coefficient (B, D) images showing multiple small acute lacunar-type infarcts.

Serial videotaped evaluations were performed. Smaller amplitude choreic movements of the left leg were intermittent and were best captured during the post-treatment interval (Video Segment 2). He also had dystonic posturing of his left arm behind his back, flexor posturing of his left finger digits, and dystonic left foot inversion (Video Segment 2).

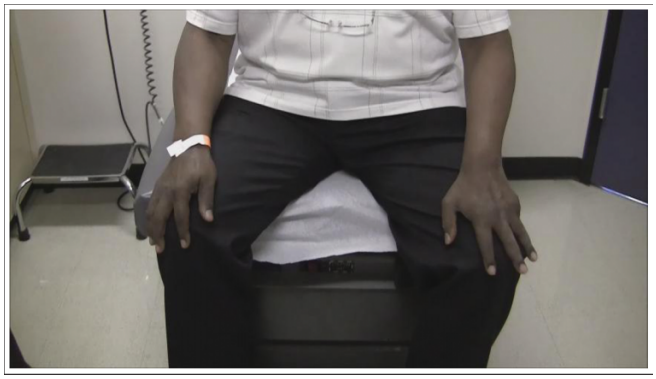
Initial treatments included total daily doses of haloperidol (3.5 mg), risperidone (1 mg), baclofen (30 mg), and valproic acid (1,500 mg) at separate, successive intervals, each with intolerable side effects of sedation and/or limited efficacy. This was followed by treatment with tetrabenazine 12.5 mg three times a day with partial reduction of the hyperkinetic movements (Video Segment 3). Ten months after he initiated tetrabenazine 12.5 mg three times a day, he reported fatigue. An attempt to gradually taper off the medication resulted in worsening HCHB. As a result of persistent left HCHB after several days of discontinuation, tetrabenazine was restarted and gradually increased

Video Segment 1. Before Treatment with Chemodenervation or Tetrabenazine.



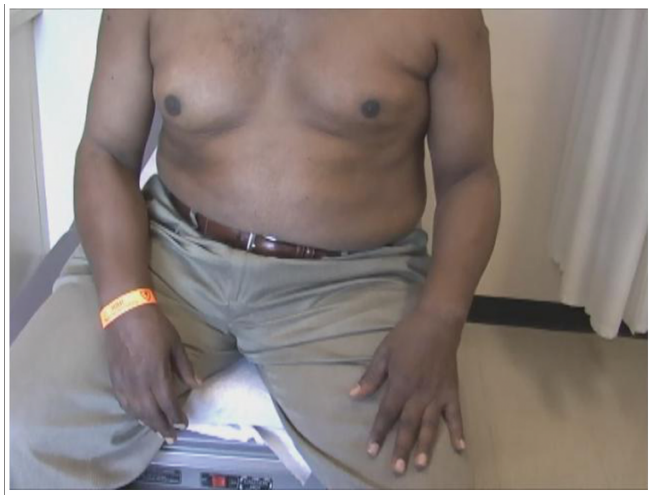
The patient has hemichorea–hemiballismus of the left arm.

Video Segment 2. After Treatment with Chemodenervation and Tetrabenazine 12.5 mg bid.



The patient has hemichorea–hemiballismus of the left arm, chorea of the left leg, left arm dystonia, and dystonic left foot inversion. Hyperkinetic movements and dystonia are reduced after treatment.

Video Segment 3. After Treatment with Chemodenervation and Tetrabenazine 12.5 mg tid.



Hyperkinetic movements and dystonia are reduced after treatment.

over a period of 2 weeks to 12.5 mg bid, which the patient tolerated with reduced hyperkinetic movements.

The persistent dystonic posturing of the left arm behind his back led to severe shoulder pain and functional impairment. He was subsequently started on treatment with onabotulinumtoxinA approximately 9 months after the onset of the HCHB movements. He received a total of 155 units of onabotulinumtoxinA by injection to the left infraspinatus (30 units), left pectoralis major (30 units), left deltoid (30 units), left flexor carpi radialis (20 units), left flexor carpi ulnaris (25 units), and left extensor carpi radialis (20 units). After several treatments with onabotulinumtoxinA injections, he reported a moderate reduction of the dystonia with functional improvement of the left arm (Video Segment 3). He was continued on onabotulinumtoxinA injections every 3–6 months along with tetrabenazine 12.5 mg twice a day with improvement of the hyperkinetic movements and dystonia.

Discussion

We report a case of HCHB with associated dystonia. The term hemichorea–hemiballismus represents a spectrum of hyperkinetic movement disorders varying in the severity of choreic and/or ballistic movements.[1,2] HCHB cases have been previously described with associated dystonia; however, the exact mechanism for the variability in phenomenology is not well understood. Dewey and Jankovic[1] reported that 10 out of 21 patients with HCHB were likely associated with stroke. Six out of those 10 patients were also characterized as having dystonia with varied lesion locations, including subcortical and cortical regions.[1] Additionally, post-stroke dystonia–chorea of a jerky quality has been described, typically associated with thalamic stroke and sensory loss.[4,5] The variability in the phenomenology of stroke-induced HCHB is likely to be a result of the lesion location and the degree of disruption of cortical and/or subcortical structures that regulate movement.

Cortical strokes are less commonly associated with HCHB. A unique aspect of the case was the development of HCHB after a stroke involving the cortex and subcortical white matter. Diffusion-weighted magnetic resonance imaging (MRI) of the brain (Figure 1) showed multiple areas of lacunar-type infarcts involving the right posterior frontal lobe white matter and small cortical infarcts in the right temporal–frontal–parietal junction. Isolated subthalamic lesions have been associated with pure hemiballismus;[6] however, one specific location has not been identified as the cause of HCHB. In a clinical–radiological study of post-stroke hemichorea patients, lesion location included the caudate, putamen, subthalamus, globus pallidus, and cerebral cortex.[3] Similar to six patients in this study, our case had a cortical stroke in the middle cerebral artery territory. Proposed theories for the association of cortical lesions with HCHB include interruption of the cortical–basal ganglia pathways or the presence of a concurrent small basal ganglia infarct not detected on MRI.[3]

While some patients with post-stroke HCHB spontaneously resolve, others may have persistent symptoms that are difficult to treat. Interestingly, our case had both HCHB and dystonia. To our knowledge, treatment of post-stroke HCHB with associated dystonia has not been previously described. In one prior case of hyperglycemia-induced hemichorea and bilateral dystonia, the involuntary movements resolved after treatment with insulin and haloperidol.[7] While neuroleptics and anticonvulsants have been shown in some case series to improve HCHB symptoms,[1] these treatments failed to control the hyperkinetic movements in our case.

Tetrabenazine has been used in the treatment of hyperkinetic movement disorders, including Huntington disease, tardive dyskinesia, and hemiballismus from lesions of the subthalamic nucleus.[8] Despite its varied indications, the use of tetrabenazine in individuals with HCHB has not been widely reported. One previous study on hyperglycemia-induced HCHB showed excellent control of the HCHB with tetrabenazine.[2] Our patient demonstrated good control of his left HCHB on tetrabenazine and had noticeable worsening of his hyperkinetic movements in one instance when tetrabenazine was temporarily discontinued. The mechanism by which tetrabenazine alters the underlying pathophysiology of HCHB is not fully understood, but is likely related to its effect in depleting central dopamine levels with consequent interruption of the cortical–basal ganglia networks. Tetrabenazine is an inhibitor of the vesicular monoamine transporter 2, and thus prevents the release of monoamines and also acts as a mild dopamine receptor blocker.[2]

While our case showed reduced HCHB on tetrabenazine, he continued to have episodic dystonic posturing of his left arm. Chemodenervation is a safe and effective treatment for focal dystonias including limb dystonia.[9] Improvement of focal dystonias after treatment with chemodenervation can last up to 3 months and in many cases results in an improved functional ability of the limb. Our case reported a reduction of his left arm dystonia after chemodenervation treatments. In refractory cases of HCHB associated with dystonia, dual therapy with tetrabenazine and chemodenervation should be considered as a treatment strategy to maximize benefit and minimize functional disability.

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