Improvement in Cortical Myoclonus in a Patient with VIM Deep Brain Stimulation for Essential Tremor
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BACKGROUND
Myoclonus is sudden, brief, involuntary jerking caused by abrupt muscle contraction or discontinuation of ongoing muscular activity (negative myoclonus). Classification is clinical, physiologic and/or anatomical. Cortical myoclonus is the most common type. Its pathophysiology is incompletely understood, though there may be cerebellar influences on cortical excitability.

Case reports have described improvement in anoxic/hypoxic myoclonus, considered thalamic, after pallidal and thalamic deep brain stimulation (DBS). Mechanism(s) specific to metabolic myoclonus are largely unexamined.

METHODS
We describe a case of improved cortical myoclonus of multifactorial origin with DBS of the ventral intermediate nucleus (VIM) of the thalamus, placed for treatment of essential tremor (ET).

ON/OFF assessments using grading from the Unified Rating Scale (UMRS) were performed.

CASE REPORT
An 85-year-old right-handed man with CAD, CHF, OSA, COPD and childhood-onset essential tremor (ET) was treated with left VIM DBS in 2003 for medically refractory tremor.

He presented for evaluation after developing disabling jerking movements in all extremities.

Symptom onset: 1 week after 2 hospital admissions for acute on chronic renal failure and worsening hypercapnia.

During hospitalization, K+ = 7, Creatinine = 4.8 (baseline 2.5), and pCO2 = 56.

He underwent temporary transvenous pacemaker placement, placed on BIPAP and given insulin, glucose and kayexalate.

On discharge 5 days later, K+ = 5.8, BUN = 52, creatinine = 2.4.

Neurontin 600 mg BID was resumed for mood.

Involuntary, non-bothersome jerking movements in all limbs began during the second hospitalization.

1 week after discharge, he fell upon standing secondary to severe uncontrollable jerking of his legs.

Since then, jerking persisted which prevented safe ambulation and activities of daily living.

He presented to clinic in a wheelchair with marked myoclonus and tremor.

The DBS was found to be off.

RESULTS
Left VIM DBS settings were: polarity: 0(-1);(+) amplitude: 3.7V; pulse width: 150 μs; frequency: 185 Hz.

Components of the UMRS were scored.

The maximum possible myoclonus rating was 76, and myoclonus improved by 14.5% with DBS ON. (Video 2)

The maximum lateralized score was 32 (Figure 3).

DISCUSSION
Our patient’s presentation is most consistent with cortical myoclonus based on: sudden multi-focal jerking limb movements worse with action, multiple metabolic abnormalities and history of high-dose gabapentin exposure.

Negative myoclonus may be caused by activation of inhibitory areas within sensorimotor cortex.

Metabolic myoclonus is typically cortical.

REFERENCES

Poster available for download.