

**A child with reflexogenic atonic seizures: the implication of the mesial frontal area and the frontostriatal tract in producing atonic seizures.**

**R. Tang-Wai, R. Tang-Wai<sup>1</sup>, J. Mailo<sup>2</sup>, R. Hung<sup>3</sup>**

<sup>1</sup>*Pediatrics, Loma Linda University, USA*

<sup>2</sup>*Pediatrics, University of Alberta, Canada*

<sup>3</sup>*Radiology, University of Alberta, Canada*

**Purpose:** The understanding of negative motor seizures and their underlying structures and pathways remains limited and speculative. **Method:** We present a pediatric patient with an unusual reflexogenic seizure in which patting the back had caused the patient to slump forward and appear like she was asleep; moreover, the persistent back patting prevented the patient from moving. The patient would then move immediately after the back patting had stopped. **Results:** Video analysis of these reflexogenic seizures confirmed that the seizure semiology was consistent with the ILAE classification of atonic seizures and that continued back patting inhibited movement thus being consistent with negative motor seizures. Furthermore, EEG analysis revealed an ictal pattern involving the vertex region while SPECT-SISCOM imaging showed ictal hyperperfusion in the right mesial frontal region in addition to the bilateral paramedian precentral and postcentral gyri, and the right basal ganglia. **Conclusion:** Our findings therefore implicate the putative mesial frontal negative motor area and the corresponding frontostriatal tracts in the production of atonic seizures and the inhibition of movement. It is therefore suggested that negative motor seizures may manifest as a spectrum that includes atonic seizures and supports the notion that stimulation of the negative motor area and activation of the frontostriatal tract actively inhibits motor activity and not merely disrupt positive motor areas.