



## Late-Onset Atlantoaxial Instability Results in Brainstem Dysfunction and Intractable Nausea and Vomiting in C5 ASIA A Spinal Cord Injury

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### INTRODUCTION

- ❖ In patients with intractable nausea and vomiting, multiple etiologies must be considered
- ❖ Differential diagnosis of nausea/vomiting in SCI includes:
  - ❖ Medication side effect
  - ❖ Gastroparesis
  - ❖ Autonomic dysreflexia
  - ❖ Anxiety
  - ❖ Hypercalcemia
  - ❖ Gastric reflux
  - ❖ Constipation
- ❖ Brainstem dysfunction can also be a cause as the vomiting center lies within medulla oblongata, comprised of the reticular formation and nucleus of tractus solitarius

### CASE DESCRIPTION

- ❖ A 16-year-old female status post motor vehicle accident suffered a C5 ASIA A spinal cord injury
- ❖ She underwent the following surgeries while at the acute care hospital:
  - ❖ C2-T2 posterior fusion for spine stabilization
  - ❖ Gastric Feeding tube placement
  - ❖ Tracheostomy placement
- ❖ She transferred to inpatient rehabilitation one month following her injury
- ❖ She suffered intractable nausea/vomiting and feeding intolerance, severely limiting her initial rehabilitation



Figure1: *Brainstem MRI results:* Mild posterior displacement of the cervicomedullary junction caused by mild superior posterior subluxation of the dens relative to C1 concerning for atlantoaxial instability

### CLINICAL COURSE

- ❖ Multiple etiologies were considered and each of these was treated systematically with multiple medication changes and feeding adjustments.
  - ❖ Electrolytes including calcium were within normal range
  - ❖ Additional multifactorial treatment considerations included modifications to patient's positioning, rehabilitation psychology, wheelchair adjustments to improve sitting tolerance and overall comfort, and modified therapy sessions

### CLINICAL COURSE: (CONTINUED)

- ❖ Her symptoms persisted despite these treatments, she continued to lose significant weight and her participation in therapy remained suboptimal
- ❖ Her inpatient physiatrist became increasingly concerned with centralized etiology although she had no other signs or symptoms
- ❖ Cervical MRI demonstrated subluxation of the dens onto the brainstem, denoting brainstem compression and concern for atlantoaxial instability
- ❖ She underwent occipital to C2 fusion with resolution of symptoms and successfully completed rehabilitation

### DISCUSSION/CONCLUSIONS

- ❖ Brainstem dysfunction may manifest as persistent, intractable nausea and vomiting in cervical spinal cord injury and should be considered if all other treatments prove ineffective
- ❖ To our knowledge, this is the first reported case of atlantoaxial instability causing intractable nausea/vomiting due to brainstem compression in a new spinal cord injury patient

### REFERENCES

- ❖ Becker DE. Nausea, Vomiting, and Hiccups: A Review of Mechanisms and Treatment. *Anesthesia Progress*. 2010;57(4):150-157. doi:10.2344/0003-3006-57.4.150.

