Reversal of Vision Metamorphopsia: A Rare Presentation of Status Migrainosus

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Case Presentation:
Our patient is a 42-year-old female with a past medical history of migraines secondary to traumatic bifrontal small subarachnoid hemorrhages in 2017. She presented to the emergency department with left upper extremity weakness and a headache that began an hour before arrival. In the emergency department, she was stroke-activated. CT of the Head without contrast and CTA of the head and neck were negative for acute hemorrhage or infarction. Initial vitals were within normal limits. The initial neurological exam was limited as the patient was very anxious and unable to follow commands. Initial labs, including CBC, CMP, and TSH, were normal. Urine drug screen, B12, ammonia, and HIV were negative. On further evaluation, the patient appeared very anxious. Motor strength and sensation were intact bilaterally. She was alert but not oriented to self, time, place, or situation. The patient did not recognize her husband or her two daughters. Collateral information was obtained from the family; the patient was at her baseline earlier that morning. According to her daughter, the patient had not had any recent illness, travel, or trauma. The patient did not take any medications, aside from ibuprofen for headaches.

The following day, the patient continued to endorse confusion, increased headaches, and dizziness. MRI of the brain with and without contrast was negative. Lumbar puncture revealed initial CSF studies that were negative aside from mildly elevated protein at 46.2. The meningitis panel and vasculitis panel were negative. An autoimmune encephalitis panel was obtained, but given the patient's severe symptoms, she was empirically treated with 5 days of intravenous methylprednisolone. Auditory and visual evoked potentials were unremarkable, and electroencephalography (EEG) was normal. On re-evaluation, she was found to be fluently writing and reading upside down and backward, although she did not see the rest of the world in this manner. Given this new finding of reversal of vision metamorphopsia (RVM), another MRI of the brain was obtained which showed a frontal lesion and hypoplastic right vertebral artery. Over the next 5 days, the patient's confusion started to improve but she continued to demonstrate RVM. The autoimmune encephalitis panel came back negative, and steroids were tapered off. The patient's symptoms were thought to be due to status migrainosus, and she was discharged with propranolol for migraine prophylaxis.

Discussion
Complete RVM is described as a 180-degree rotation of the visual field in the coronal plane. This condition can be severely detrimental to one's functional ability. Based on prior meta-analyses, the most common etiology is acute infarction, particularly in the brainstem and cerebellum. Other, less common etiologies include the disruption of the peripheral portion of the vestibular pathway, including the semicircular canals, otolith organs, and the vestibular component of the vestibulocochlear nerve.

When working up the RVM, it was vital to examine the most common causes as mentioned. Imaging ruled out lesions in the brainstem, cerebellum, and vestibulocochlear pathway. While the patient initially presented with headaches, other symptoms such as vertigo, dizziness, nausea, or vomiting were absent, which would more commonly be seen with lesions affecting the vestibular pathway. Although the patient could not express the presence or absence of an aura, a potential differential diagnosis of status migrainosus was also worked up. She was given

high-dose steroids, which can be used in migraine management to help break a status migrainosus. A functional cause was also evaluated, given her recent marriage, a young child, prior abusive marriage, and being unable to recognize her new partner. Psychiatry was consulted and did not determine that she was in grave danger, and her presentation was more organic than psychiatric. This leads one to believe that her symptoms are likely associated with status migrainosus, as she gradually returned to her baseline once it was controlled.

The literature emphasizes the importance of the viability of all components of the visuospatial network in incorporating different sensory perspectives in the normal interpretation of verticality. Here, we present a case of RVM with a frontal lesion (1 case previously reported) and a hypoplastic right vertebral artery, which is a peculiar pattern that adds value to the pre-existing literature on RVMs. Additionally, this patient's inverted vision is limited to reading and writing. This case provides an interesting example of RVM associated with status migrainosus, adding to the differential for RVM.