CAROLINAS REHABILITATION

Atrium Health

A Rare Occurrence of Movement Disorder Following Stroke

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Introduction

- Movement disorders occur in association with stroke, and may have important clinical and functional implications
- Tremors are a type of movement disorder described as involuntary, alternating movements resulting in rhythmic oscillations, and are classified according to circumstances in which the tremor occurs
- Hemorrhagic lesions from vascular malformations have been shown to be more likely to result in tremors

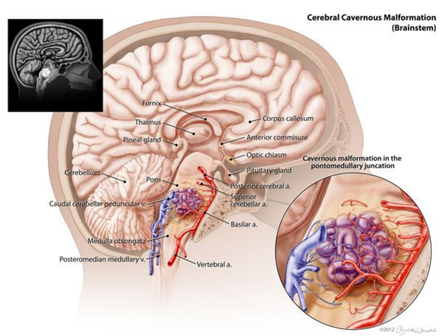

Figure 1. Illustration of brainstem cavernous malformation[5]

There are four general types of congenital vascular malformations:

- Developmental venous anomalies (2%)
- Arteriovenous malformations (AVMs, 1%)
- Capillary telangiectasias (0.7%)
- Cavernous malformations (0.6%)
- Arteriovenous and cavernous malformations have been found to have higher tendency to cause neurologic sequelae compared to other vascular malformations[2]

Cavernous malformations[3]

- Network of low-flow enlarged capillaries
- No well-defined feeding arteries or draining veins
- Presenting symptoms can include:
  - Headache
  - Seizures
  - Progressive focal neurologic deficits
  - Intracranial hemorrhage

Case Report

- 20-year-old male with a past medical history significant for seizure disorder secondary to right midbrain cavernous angioma
- Patient presented to ED with physical exam significant for:
  - Weakness in left upper and lower extremity
  - 1/3 objects for 5-minute recall
  - Right eye ptosis
- MRI confirmed growing cavernous angioma located on right cerebral peduncle, and patient underwent resection

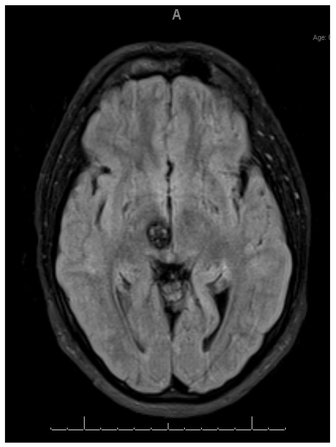

Figure 2. Axial view of MRI revealing cavernous angioma of R cerebral peduncle.

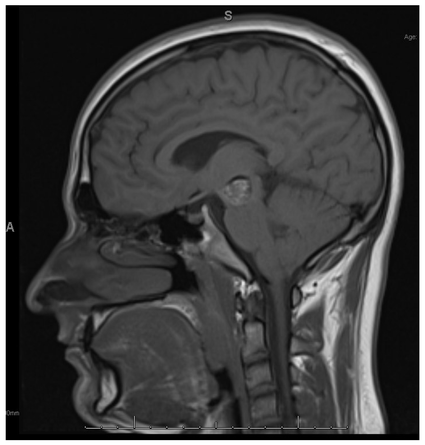

Figure 3. Sagittal view of MRI revealing cavernous angioma of R cerebral peduncle.

- <u>Inpatient Rehabilitation Course</u>:
  - Focusing on improving left sided weakness and parathesias in left hand; significant functional improvement
- <u>4-week and 8-week PM&R Outpatient Follow-up</u>:
  - Complicated by left upper & lower extremity spasticity and clonus managed by titrated baclofen and tizanidine
- <u>11-week virtual follow-up findings, due to CV19 pandemic</u>:
  - Sporadic, high velocity motions of left upper extremity
  - Improvement of motion with extension of upper extremity
  - Stiffness with range of motion testing reported by family member
  - Left lower extremity tremor improvement with ambulation
- Patient was subsequently diagnosed with a **Holmes/rubral tremor**
  - The tremor was present at rest, posture and with action
  - The patient was started on a trial of carbidopa/levodopa
  - Sinemet proved unsuccessful; however Deep Brain Stimulation revealed improved function at later follow-up visit

Discussion

Holmes/Rubral tremor

- Predominantly unilateral
- Low-frequency, high-amplitude
- Rest, kinetic and postural tremor
- Most commonly caused by vascular malformations localized in the brainstem
- Associated symptoms: Ophthalmoplegia, ataxia
- Generally appears after a delay of one to twenty-four months following stroke

Treatment

- Targets the dopaminergic system (i.e. carbidopa-levodopa)
- Benzodiazepines
- Anti-epileptics
- Thalamotomy
- Deep brain stimulation[4]

Conclusion

- Familiarity with the presentation, timing, and pathophysiology of movement disorders such as Holmes tremor is essential for physiatrists following the stroke population
- Diagnosis can be complicated by delayed presentation
- Further research is indicated regarding the long-term efficacy of available treatment options

References

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Acknowledgements

This case was reviewed by the Atrium Health Institutional Review Board and was found to be exempt. We would like to thank the Department of Physical Medicine and Rehabilitation at Atrium Health for supporting this project.