

## A Rare Cause of Syncope

A 65-year-old woman is brought to the emergency department due to a syncopal episode and posterior head laceration. She reports of passing out in her bathroom for an unknown amount of time and waking up in a pool of blood. She also reports of one week of worsening headaches and severe nausea. The patient believes her symptoms are due to a recent course of doxycycline. The patient denies fever, weight loss, chest pain, palpitations, diaphoresis, or double vision. Past medical history is significant for a diagnosis of Parkinson's Disease 1 year ago. She takes no medications. She smokes a pack of cigarettes per day. Her temperature is 98.6°F, blood pressure is 119/75 mmHg, pulse is 84 beats/min, and respirations are 16 breaths/min. Neurologic examination is significant for right-sided upper and lower extremity tremors and abnormal gait. ECG shows normal sinus rhythm. What is the most appropriate next step in management?

- A. Chemotherapy**
- B. Brain radiation**
- C. CT head w/o contrast**
- D. Surgical resection**
- E. PET scan**

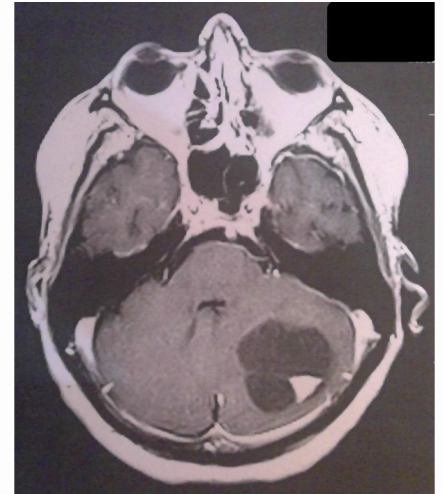


Figure 1. MRI Brain with Perfusion

### Lab Results:

WBC – 3.87 (L)  
Hgb – 13.2  
Pit – 132 (L)  
  
Na – 134 (L)  
K – 3.5  
BUN – 10  
Cr – 0.8  
  
Total Protein – 5.8 (L)  
Albumin – 3.1 (L)  
AST – 40 (H)  
ALT – 32  
Total Bilirubin – 0.4

## Correct Answer: C. CT Head w/o contrast

CT scan for this patient revealed a left cerebellar intra-axial cystic mass 3.7 x 3.4 cm.

The differential diagnosis for this patient includes metastatic tumor, cystic astrocytoma, primary CNS tumor, hemangioblastoma.

## Discussion

When approaching syncope, it is important to rule out immediate and alarming causes for why the patient experienced loss of consciousness. A thorough history and physical exam are crucial to assess etiology and direct workup and management. Life-threatening causes of syncope include cardiac and neurologic disease, pulmonary embolism and hemorrhage. Less concerning causes include reflex-mediated syncope, orthostatic hypotension and medication-induced syncope.

Electrocardiography should immediately be performed to rule out cardiac arrhythmias like atrial fibrillation, ventricular tachycardia, and sinus arrest. Further cardiac studies like echocardiography may be performed to further assess for flow function and valvular disease<sup>1</sup>. Carotid artery flow may be assessed with ultrasonography to rule out stenosis<sup>2</sup>.

When all else is negative, it is important to recognize that although rare, neoplastic processes can also lead to syncopal episodes (0.1% of all syncopal episodes)<sup>3</sup> and CT brain without contrast is warranted as a preliminary study. As seen in this patient, cerebellar neoplastic processes may present with symptoms expected of lesions from this locus, including contralateral limb ataxia, gait issues, and tremors<sup>4</sup>. With tumor extension compressing the fourth ventricle, symptoms may arise from increased intracranial pressure such as nausea, loss of consciousness, and headaches.

## Management

Treatment is based on presence of traumatic injuries from the syncopal event and the etiology of syncope. If unexplained syncope, patients with a history of heart disease, non-prodromal syncope, recurrent syncope, significant trauma and elderly patients are generally considered high-risk and should be considered for admission for further evaluation (Figure 2).

Patients with cerebellar tumors are managed in the emergency department with control of clinical symptoms, imaging, and prompt admission for neurosurgical evaluation regarding tumor resection. ED management of this patient included laceration repair and nausea control with ondansetron. Seizure prophylaxis can be considered with levetiracetam<sup>5</sup>. Corticosteroid initiation may also be indicated for edema control surrounding the neoplastic lesion<sup>5</sup>. Adequate additional imaging includes MRI of the brain with and without contrast and/or MR angiography to assess flow parameters within the neoplastic tissue<sup>6</sup>. For this patient, MRI of the brain revealed surrounding vasogenic edema with mass effect shifting the fourth ventricle.

This patient was admitted for surgical resection of the mass. Resection often treats increased intracranial pressure and assists in local control of neurological sequelae. Resection also allows for definitive diagnosis of the lesion. Further management is guided by pathological results and can often deem whether oncological treatment, radiation, or further measures are warranted.

## Syncope Workup

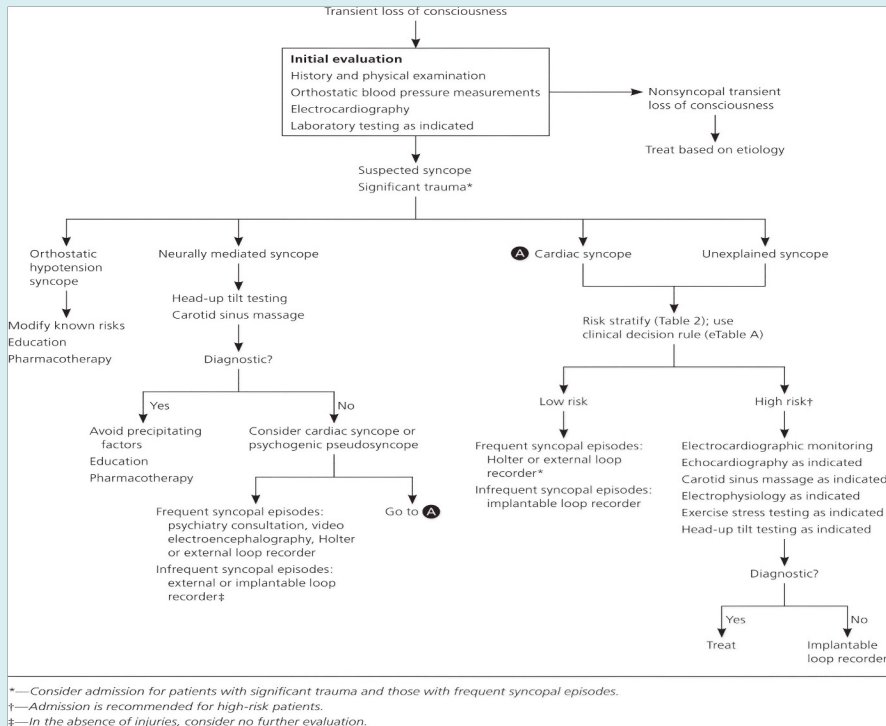
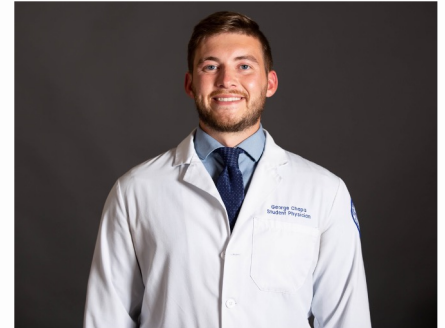


Figure 2. Syncope: evaluation and differential diagnosis<sup>7</sup>

## Take Home Points

- A thorough history and physical exam are crucial to assess etiology of syncopal episodes and to direct workup and management
- Although rare, neoplasm should be considered in the differential of patients presenting with syncope
- Cerebellar pathologies can present with gait instability, incoordination, and tremors
- Ventricular extension/mass effect and increased cranial pressure can contribute to symptoms of nausea and headaches

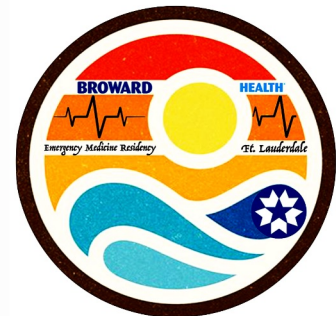


### About the Author

This month's case was written by George Chapa. George is a 4th year medical student from NSU KPCOM. He did his emergency medicine rotation at BHMC in September 2022. George plans on pursuing a career in General Surgery after graduation.

### References

1. Shen, W. K., Sheldon, R. S., Benditt, D. G., Cohen, M. I., Forman, D. E., Goldberger, Z. D., Grubb, B. P., Hamdan, M. H., Krahn, A. D., Link, M. S., Olshansky, B., Raj, S. R., Sandhu, R. K., Sorajja, D., Sun, B. C., & Yancy, C. W. (2017). 2017 ACC/AHA/HRS Guideline for the Evaluation and Management of Patients With Syncope: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society. *Journal of the American College of Cardiology*, 70(5), e39–e110. <https://doi.org/10.1016/j.jacc.2017.03.003>
2. Ungar, A., Morrione, A., Rafanelli, M., Ruffolo, E., Brunetti, M. A., Chisciotti, V. M., Masotti, G., Del Rosso, A., & Marchionni, N. (2009). The management of syncope in older adults. *Minerva medica*, 100(4), 247–258.
3. Lorenzen, M. O. B., Farkas, D. K., Adelborg, K., Sundball, J., & Sørensen, H. T. (2020). Syncope as a sign of occult cancers: a population-based cohort study. *British journal of cancer*, 122(4), 595-600.
4. Louis, D. N., Perry, A., Wesseling, P., Brat, D. J., Cree, I. A., Figarella-Branger, D., Hawkins, C., Ng, H. K., Pfister, S. M., Reifenberger, G., Soffietti, R., von Deimling, A., & Ellison, D. W. (2021). The 2021 WHO Classification of Tumors of the Central Nervous System: a summary. *Neuro-oncology*, 23(8), 1231–1251. <https://doi.org/10.1093/neuonc/noab106>
5. Walbert, T., Harrison, R. A., Schiff, D., Avila, E. K., Chen, M., Kandula, P., Lee, J. W., Le Rhun, E., Stevens, G., Vogelbaum, M. A., Wick, W., Weller, M., Wen, P. Y., & Gerstner, E. R. (2021). SNO and EANO practice guideline update: Anticonvulsant prophylaxis in patients with newly diagnosed brain tumors. *Neuro-oncology*, 23(11), 1835–1844. <https://doi.org/10.1093/neuonc/noab106>
6. Luna, L. P., Sherbat, F. G., Sair, H. I., Mukherjee, D., Oliveira, I. B., & Köhler, C. A. (2021). Can Preoperative Mapping with Functional MRI Reduce Morbidity in Brain Tumor Resection? A Systematic Review and Meta-Analysis of 68 Observational Studies. *Radiology*, 300(2), 338–349. <https://doi.org/10.1148/radiol.2021204723>
7. Runser, L. A., Gauer, R., & Houser, A. (2017). Syncope: evaluation and differential diagnosis. *American family physician*, 95(5), 303-312.



@browardem