

Background

Reversible Cerebral Vasoconstrictive Syndrome (RCVS)

- RCVS is characterized by acute onset thunderclap headache due to segmental constriction of the cerebral arteries (Ducros, 2012)
- Complications can include ischemic and hemorrhagic stroke (Ducros, 2012)
- Pathophysiology is unclear, but theoretically related to sympathetic regulation of vascular tone (Ducros, 2012)
- Serotonergic medications and cannabis are the most common known precipitants, but emotional triggers have also been postulated (Ducros, 2012; Rao 2021)

Reverse Takotsubo Cardiomyopathy (rTTC)

- Reverse takotsubo cardiomyopathy (rTTC) is a rare variant of stress-induced cardiomyopathy resulting in hypokinesis, akinesis, or dyskinesis of the left ventricular basal segments (Awad, 2018)
- Patient presentation often includes acute chest pain, abdominal pain, and troponinemia (Awad, 2018)
- rTTC has been associated with emotional and neurologic distress but never previously identified within the setting of RCVS (Awad, 2018; Samuels, 2007)

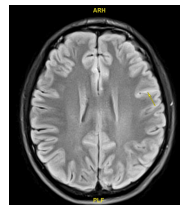
ED Course

He developed bradycardia (HR 20s) and then several minutes of rapid wide-complex ventricular tachycardia, intermittent SVT, and troponinemia (peak 3.11). He then experienced severe headache and dysarthria. He was admitted for cardiac stabilization and neurologic work-up. Patient identified his mood symptoms as the underlying cause of his medical presentation.

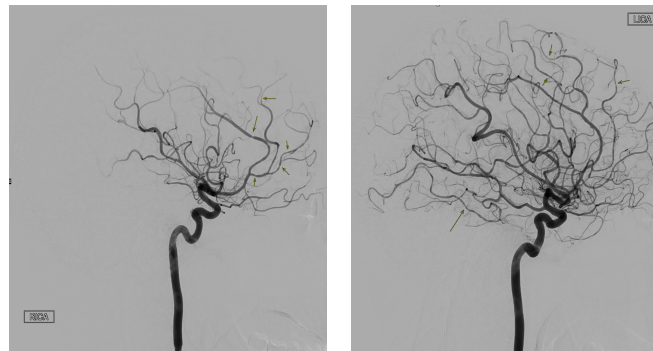
Past Psychiatric and Medical History

Patient had been taking sertraline 50 mg every other day for mood. He was using approximately 1 g of cannabis daily. He had a history of migraines.

Neuroimaging Results

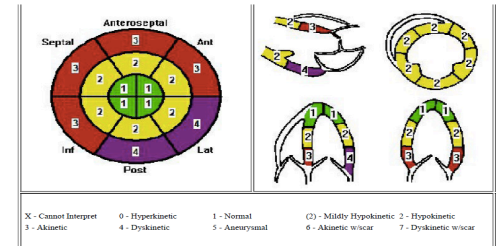


MRI FLAIR sequence showing small volume subarachnoid hemorrhage in L frontal lobe sulci



Cerebral angiography demonstrating bilateral, multifocal segments of luminal narrowing in the anterior, middle, and posterior cerebral arteries, consistent with RCVS.

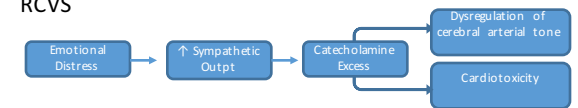
Cardiac Findings



Transthoracic echocardiogram, hemodynamic findings. Mid-segment hypokinesis of all walls; basal akinesis of septum, inferior, and anterior walls; dyskinesis of basal anterolateral and inferolateral walls. Pattern seen with rTTC.

Discussion

- Patient had known risk factors for RCVS (use of sertraline, cannabis, history of migraines) and was in a state of high psychiatric distress when symptoms of cardiomyopathy and RCVS developed
- A commonly proposed mechanism for rTTC is catecholamine surge leading to sympathetic nervous system over-activation and cardiotoxicity. A similar sympathetic overdrive also has been suspected in the pathophysiology of RCVS (Awad, 2018; Rao, 2021; Samuels, 2007)
- Because psychiatric distress preceded this patient's neurologic and cardiac symptoms, this case is consistent with a shared catecholamine surge model and also appears to support emotional distress as a precipitating factor for RCVS



Conclusion

- This appears to be the first documented case of concomitant rTTC and RCVS, adding to a growing understanding of the relationship between psychiatric distress and the neurocardiogenic axis.

Case

Presentation

A 23-year-old healthy male with chronic cannabis use had been experiencing grief, severe depression, and anxiety symptoms after witnessing the death of a close friend. Patient was driving to his friend's memorial service when he noticed periumbilical abdominal pain and presented to the ED.

References

Awad HH, McNeal AR, Goyal H. Reverse Takotsubo cardiomyopathy: a comprehensive review. *Ann Transl Med.* 2018;6(23):460. doi:10.21037/atm.2018.11.08.
 Ducros A. Reversible cerebral vasoconstriction syndrome. *Lancet Neurol.* 2012 Oct;11(10):906-17. doi: 10.1016/S1474-4422(12)70135-7.
 Rao P, et al. Grief-induced reversible cerebral vasoconstriction syndrome (RCVS). *BMJ Case Rep.* 2020 Jan 29;13(1):e232204. doi: 10.1136/bcr-2019-232204.
 Samuels, Martin. (2007). "Voodoo" death revisited: The modern lessons of neurocardiology. *Cleveland Clinic journal of medicine.* 74 Suppl 1. S8-16. 10.3949/ccjm.74.Suppl_1.S8.

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