

## INTRODUCTION

- Takotsubo cardiomyopathy (TC) is increasingly recognized in neurocritical care population with preponderance in postmenopausal females, with subarachnoid hemorrhage being the most common trigger in neurocritical care unit followed by seizures in the list <sup>(1)</sup>.
- In the literature, only 11 case reports of takotsubo cardiomyopathy triggered by epilepsy have been published <sup>(1,2,3)</sup>.
- The association between seizures and TC is unclear. It is considered a reversible neuro-myocardial failure which has been thought to be related to an acute catecholamine toxicity of the myocardium initiated by a stressful event such as seizures <sup>(4)</sup>.
- We present a case in which seizures resulted in TC requiring escalation of care with mechanical circulatory support and hence importance of getting a baseline EKG and troponin in such cases.

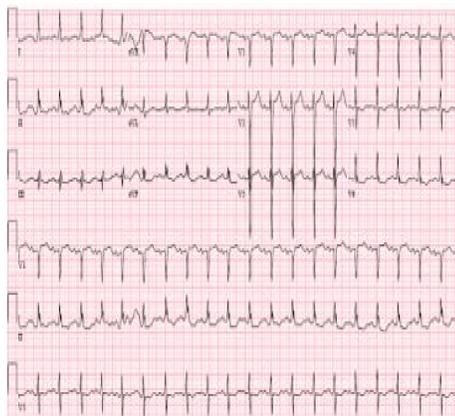
## METHODS

- Case report and review of the literature.

## HOSPITAL COURSE

- A 69-year-old female with a prior stroke with no residual deficits, hypertension, diabetes mellitus, CAD who presented with two episodes of reported generalized tonic-clonic seizures without return to baseline.
- On exam the patient was obtunded but moving all extremities to noxious stimuli with a grossly non-focal neurologic exam.
- Systolic blood pressure on admission was elevated to 200. Initial computed tomography of the head (CTH) revealed chronic left frontal and right cerebellar infarcts.
- Three hours after admission, her EKG showed diffuse ST-segment depressions in the inferolateral leads with troponin elevation to ~20.
- Patient was intubated and taken for an emergent cardiac catheterization which showed no evidence of obstructive disease.
- The next morning, she became hypotensive, was refractory to three vasopressors. Bedside echocardiogram showed evidence of biventricular hypokinesis consistent with severe TC.
- She required escalation of care with mechanical circulatory support involving placement of an Impella device and veno-arterial extra corporeal membrane oxygenation (VA-ECMO).
- Repeat brain imaging showed evidence of anoxic brain injury with no improvement in exam hence and after one week, care was withdrawn after discussion with the family.

## EKG



**FIGURE 1.** Sinus tachycardia, HR 124/min, ST and T wave depressions in infero-lateral leads concerning for inferior wall ischemia.

## TTE



**FIGURES 2 (SYSTOLE) AND 3 (DIASTOLE).** Left ventricle chamber size (by vol index) is small. Moderate concentric LV hypertrophy. All LV segments are severely hypokinetic. Global LV systolic function is severely reduced. Estimated LV ejection fraction by qualitative assessment is severely reduced (<20%). Right ventricle chamber size is abnormally small. Global right ventricular systolic function is severely reduced. RV pacing wire is visualized.

## NEUROLOGIC EXAM

**Mental Examination:** Obtunded, arousable to deep stimulation but quickly falls back asleep.

**Cranial Nerve Examination:** Fundi: Pupils pinpoint, minimally reactive. + corneal reflexes B/L. + OCR B/L. Face grossly symmetric.

**Motor Examination:** Normal bulk. Normal tone. Able to move all extremities to deep stimulation, not antigravity.

**Reflexes:** Grossly 2+ in B/L UE and 1+ in B/L LE, Toes withdrawal B/L.

**Sensation:** Grimaces and withdrawal to pain throughout.

**Coordination:** Unable to assess.

**Gait, Balance and Posture:** Unable to assess.

**Glasgow Coma Scale:** 8

**Eye Opening:** To pain - 2

**Best Verbal Response:** None - 1

**Best Motor Response:** Localizes pain - 5

## REFERENCES

- Lemke DM, Hussain SI, Wolfe TJ et al. Takotsubo cardiomyopathy associated with seizures. *Neurocrit Care.* 2008;9:112–7.
- Akashi YJ, Goldstein DS, Barbaro G, et al. Takotsubo cardiomyopathy: A new form of acute, reversible heart failure. *Circulation.* 2008;118:2754–62.
- Cristancho MA, Alici Y, Augoustides JG, et al. Uncommon but serious complications associated with electroconvulsive therapy: Recognition and management for the clinician. *Curr Psychiatry.* 2008;10:474–80.
- Htay HK, Nour AA, Sunil U, Samer A. Seizure associated Takotsubo syndrome: A rare combination. *Case Rep Cardiol.* 2017 Jul 24. doi: 10.1155/2017/8458054.
- Finsterer J, Bersano A. Seizure-triggered Takotsubo rarely cause SUDEP. *Seizure.* 2015;31:84–7.

## CONCLUSION

- Seizures may result in TC, however the association is poorly understood.
- This case illustrates importance of EKG in all patients with seizure irrespective of cardiac symptoms as TC could be the cause of sudden unexpected death in epilepsy (SUDEP) <sup>(4)</sup> but certain reviews argue against it <sup>(5)</sup>.
- A high index of suspicion is necessary to diagnose this condition early, given the potential reversible nature of this entity. Diagnosing TC in patients after a seizure is essential since treatment of TC may improve the outcome of affected patients.
- In general, postmenopausal women who present with seizure are admitted to neurocritical care unit for other reasons including strokes and subarachnoid hemorrhage, are at increased risk of TC, and should have baseline ECG and repeat ECG ordered in cases of change in clinical condition <sup>(4)</sup>.
- Because the mortality rate of TC is between 1–3.2% <sup>(2)</sup>, and is mostly due to cardiac instability, therefore getting an EKG is imperative after any seizure to detect a Takotsubo cardiomyopathy.

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