



# A New Take on Brainstorming:

## An Uncommon Presentation of Electrical Storm

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### Introduction:

Electrical Storm refers to a state of cardiac electrical instability that is defined by >3 episodes of sustained Ventricular Tachycardia, Ventricular Fibrillation, or appropriate shocks from an intracardiac defibrillator within 24hrs. We present an uncommon presentation of electrical storm posing formidable therapeutic challenge

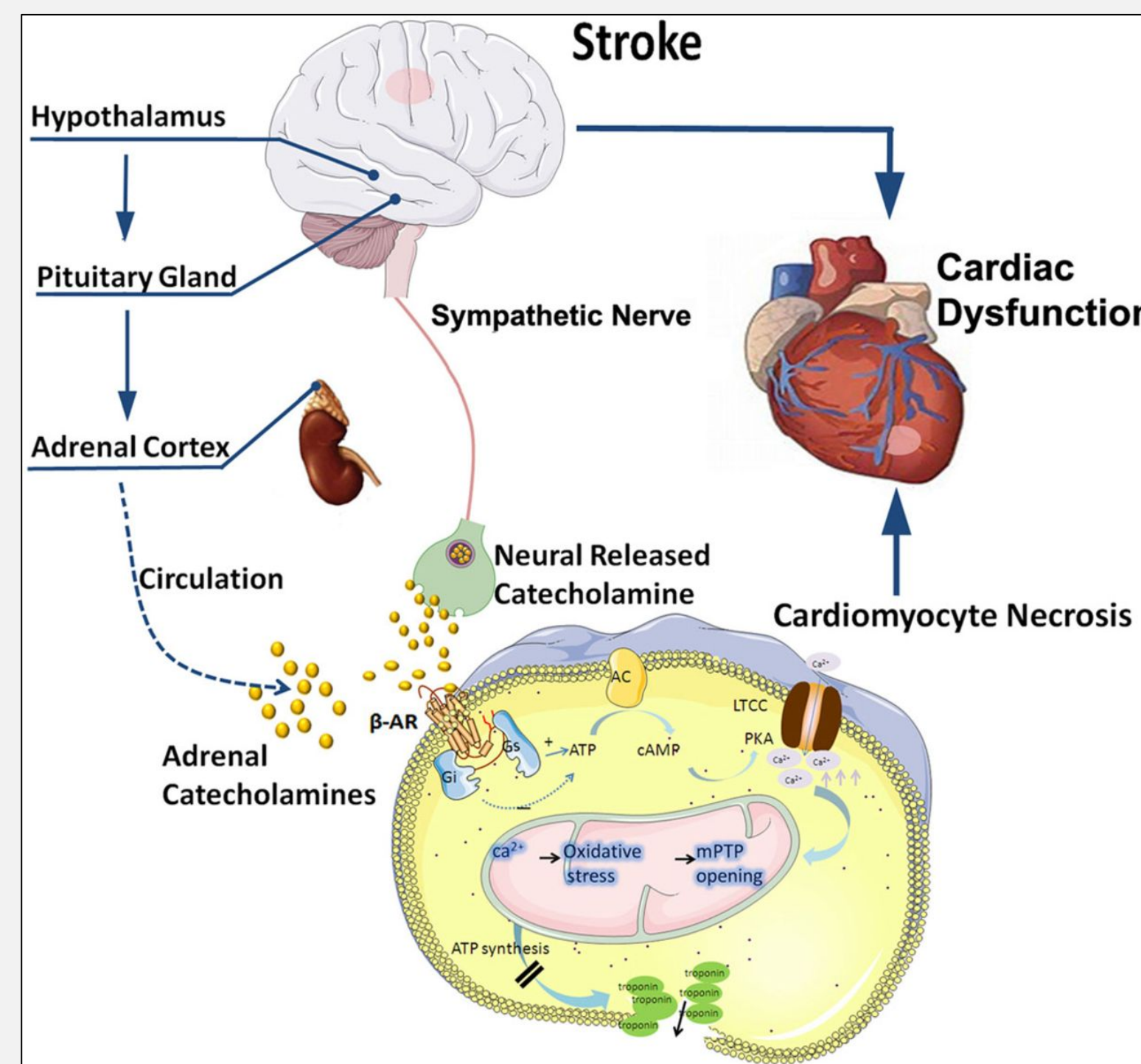
### Case Description:

65 yo female w/ complex past cardiac history who presented to ED after witnessed collapse in field. Intubated prior to arrival, she was ultimately found to be unresponsive in ED and admitted to the ICU for management

### Past Medical History:

- Rheumatic mitral stenosis, severe - s/p mechanical MVR
- Permanent a-fib s/p AV nodal ablation and DC PPM
- Pacemaker induced cardiomyopathy (s/p CRT)
- Type 2 Diabetes Mellitus, Hypertension, NASH, CKD 3a
- Notable she has no known ischemic heart disease

**Medications:** Warfarin, Metoprolol, Ramipril, Simvastatin, Empagliflozin, Spironolactone, Furosemide



Mechanism behind neuro-cardiac injury



"Cerebral" deep inverted T waves

### Discussion:

**Diagnostic Conclusion:** After ruling out alternative etiology, it is suspected that our patient suffered an acquired QTc prolongation after experiencing an ischemic hypothalamic stroke

### Learning points:

- ECG abnormalities in acute stroke incidence ranging from 49% to 100%
- Most common is QT prolongation (38-71% of patients)
- Other ECG changes
  - Deep Inverted T waves AKA "cerebral T waves"
  - Flattened T waves
  - ST segment elevations/depressions
  - Prominent/large U waves
- Post-acute stroke patients likely at increased risk for cardiac arrhythmia after unopposed sympathetic stimulation
  - Most commonly occur in subarachnoid hemorrhages
  - More common in right hemispheric strokes

**Case Outcome:** Unfortunately, In the context of repeated shocks from what was felt to be irreversible acquired QTc prolongation, she transitioned to comfort measures and passed away in the hospital

### Hospital Course

- Negative EEG
- Pacemaker interrogation unremarkable
- Intermittent periods of lucidity
- Incessant malignant arrhythmia requiring >10 defibrillations AICD
- Started on anti-arrhythmic

#### Day 1

#### Day 2-3

- CT head – thalamic stroke
- Laboratory eval unremarkable

#### Day 4-5

- Undulating hyperthermia
- Labile blood pressures
- Intermittent runs VT

#### Day 6

#### Day 7

- Retrospective review of telemetry and EKG reveal acquired prolonged QTc Interval (850ms)

### References:

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