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### “Lupus, Marijuana, and Takotsubo: A Perfect Storm”: An Unusual Presentation of Takotsubo Cardiomyopathy

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## Introduction

- Takotsubo cardiomyopathy is a type of myocardial injury that marked with left ventricular contraction dysfunction.
- The estimated annual incidence is 50,000 to 100,000 cases in the United States, and less than 90% affected are post-menopausal women.
- There is no known pathogenesis for Takotsubo cardiomyopathy, but it is associated with a triggering stressful event, such as emotional, physical, or mental trauma that causes a catecholamine surge.
  - i.e. medical, surgical, obstetric, anesthetic, or psychiatric illnesses
- Takotsubo cardiomyopathy commonly affects women greater than 50 years of age and is often reversible.

## Case Report

- A 38-year-old female with a past medical history of Takotsubo cardiomyopathy ejection fraction (EF) 20-25%, mild mitral regurgitation, ANA-positive systemic lupus erythematosus (SLE), bipolar II disorder, anxiety, and depression presented to the ED with a chief complaint of diffuse abdominal pain, nausea, and vomiting.
- Our patient described her pain as a tight burning sensation that started on her right side and traveled to the retrosternal/epigastric region and her head.
- Pain was rated as 10/10 at its worst and 6/10 on exam.
- In the ED, the patient was noted to briefly lose consciousness, which lasted less than two minutes and resolved without any intervention. There was no urinary incontinence, tongue biting, motor weakness, or post-ictal state.
- EEG was normal.
- EKG showed prolonged QTc of 548 msec.
- 2D echocardiogram - LVEF 20-25%, apical ballooning and akinesis in the apex, apical septal wall, and anterior wall.
- Presenting symptoms started in June 2022 and have been a recurrent issue that required multiple hospitalizations.
- She was most recently hospitalized for a syncopal episode three weeks prior to this admission.
- SocHx: drinks 6-12 beers a day, smokes marijuana four times a week to cope with stress, unable to work due to fatigue, which then causes her stress due to financial issues
- (+) ROS: extreme fatigue, tenderness on her hand joints (MCPs and PIPs), wrists, elbows, shoulders, hips, knees, ankles, and MTPs.
- She believed that her symptoms were worsening, and she lacked insight as to what could be exacerbating her issues.

## Case Report

### Labs

- BSR 107 mg/dL, creatinine 0.49 mg/dL, potassium 3.3 mmol/L, chloride 94 mmol/L, alkaline phosphatase 127 U/L, AST 61 U/L (high), ALT 53 U/L, lipase 89 U/L
- UDS positive for amphetamines, cannabis
- Pro-BNP 1328 pg/mL (41 pg/mL two months prior to this admission)
- Troponin T elevated at 29 ng/L
- Normal CPK at 96 U/L
- ANA titer > 1:1280

### Management

- 2 mg Ativan IM for nausea
- IV NS, KCl, magnesium sulfate for hypokalemia
- Cardiac medications
  - Continued Toprol 12.5 mg QD
  - Restarted ivabradine 5 mg BID
  - Started midodrine 2.5 mg TID
  - Loop recorder placed on day 4 of admission
  - Discharged with LifeVest
  - Consider Verquvo and SGLT2 inhibitor in a future cardiology appointment
- Psychiatric drugs were withheld due to potential QT prolongation side effect.
- She was advised to cut down on her cannabis and heavy alcohol use, as well as to continue follow-up with her cardiologist and rheumatologist.

## Discussion

- In primary, the cause is directly related to acute cardiac symptoms.
- In secondary, Takotsubo is caused by another condition or a treatment for another condition (i.e. medical, surgical, obstetric, anesthetic, or psychiatric illnesses).
  - Typical Takotsubo - hypokinesia in the cardiac apex and mid-ventricular region, as well as hyper-contractility in the heart base.
  - Inverted Takotsubo - hypokinetic base and a hypercontractile apex.
  - Mid-ventricular Takotsubo - hypokinesia in the mid-ventricular region, while having hypercontractility in both the cardiac base and apex.
- Management of Takotsubo cardiomyopathy is dependent on the patient’s symptoms and LVEF. Medications such as heart failure medications and beta blockers may be considered in patients with LVEF 35%-45%.
- Our patient meets the criteria of typical Takotsubo cardiomyopathy, but this may be secondary to SLE exacerbation
  - Echocardiogram showed apical ballooning and akinesis in the apex, apical septal wall, and anterior wall that is consistent with typical Takotsubo cardiomyopathy.
  - Return of normal ventricular function (EF 50-55%) three months later in follow-up echocardiogram supports this diagnosis.
  - No specific traumatic event was recounted by the patient that would explain this outcome.
  - Her worsening SLE symptoms may be explained by her elevated ANA titer of greater than 1:1280, which has been linked with increased disease severity and flares.
- A literature review conducted on the role of SLE and cannabis use in causing Takotsubo cardiomyopathy yielded minimal results.
- Confounding factors that may explain her cardiac symptoms include heavy alcohol use and dehydration secondary from cannabis hyperemesis syndrome.
- By addressing our patient’s multiple stressors and stabilizing her SLE, her Takotsubo cardiomyopathy could resolve.

## Conclusion

- A multifactorial etiology is likely behind our patient’s Takotsubo cardiomyopathy. Her worsening SLE symptoms, heavy alcohol and cannabis use, and long-standing stress stemming from social and mental health issues may have led to her Takotsubo cardiomyopathy presentation.
- Minimizing SLE exacerbations is key to preventing exacerbation of disease.
- Takotsubo cardiomyopathy should be considered as a potential differential and outcome in a patient with SLE who presents with cardiac symptoms.

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