

CARDIAC CATHETERIZATION IN A 25-YEAR-OLD FEMALE WITH COVID-19

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INTRODUCTION

Severe acute respiratory syndrome coronavirus 2 (SARS Cov-2) is a fatal pandemic which was identified towards the end of 2019 in Wuhan, a city in China with patients presenting with pneumonia[1]. The disease spread by the virus is called the COVID-19. COVID-19 interacts with the cardiovascular system in multiple ways, increasing morbidity in patients with underlying cardiovascular conditions and provoking myocardial injury, dysfunction and even death. Studies reveal that SARS-CoV-2 has strong interaction with the human ACE2 receptor binding domain, explaining the greater transmissibility of the virus. 7.5% of myocardial cells have ACE2 expression, mediating SARS-CoV-2 entry into cardiomyocytes and causing direct cardiotoxicity[2].

CASE HISTORY

A 25-year-old African American female with no significant past medical or family history presented with complaints of generalized weakness and fever for 4 days. Her symptoms also included bilateral headache, nausea and appetite loss eventually causing crampy abdominal pain and severe diarrhea. She also endorsed a cough with minimal sputum production.

- Vitals on admission: temp 39.5, blood pressure: 88/52 mm Hg, HR:138, RR:25, 100 % oxygen saturation on room air.
- Labs: Lactic acid: 3.2, WBC: 12.7 X 10³/ul and bandemia 19%. Troponin I: 7.64 ng/ml, peaked at 12.3 ng/ml on day 2.
- 4/4 of the systemic inflammatory response syndrome (SIRS) criteria fulfilled, possible source of infection in the gastrointestinal tract. Sepsis protocol was initiated with intravenous fluids and antibiotics and she was admitted to the ICU.
- Electrocardiogram (EKG): sinus rhythm with possible old anteroseptal myocardial infarction and minor lateral ST-T wave changes. (Image 1)

HOSPITAL COURSE

- Computed Tomography (CT scan) of the abdomen reported findings suggesting sequela of enterocolitis and small bibasilar pleural effusions with left basilar subsegmental atelectasis.
- Tested positive for COVID-19 by nasopharyngeal swab.
- 2DEcho: severe global hypokinesis of the left ventricle. Ejection Fraction at 37.5%.
- The pressure measurements during cath :

Right Atrium	Right Ventricle	Pulmonary Artery	Pulmonary capillary wedge pressure	Aortic pressure	Cardiac Index (CI)	Pulmonary Artery saturation
19 mm Hg	48/26 mm Hg	45/26 mm Hg	26mm Hg	99/70 mm Hg	2.49L/m in	56.6%

- Left and right Coronary angiography was negative for coronary artery disease (Image 2) (Image 3).
- Owing to the decompensated non ischemic cardiomyopathy and rising pressor requirements, the patient was transferred for possible cardiac transplant evaluation to a tertiary care center by the end of Day 2. On Day 14, the patient's status remained unchanged on high dose pressors.



Image 2: RCA in LAO view



Image 3: LCA in RAO view

DISCUSSION

- Differentiating between the various causes of myocardial injury is crucial to determining the treatment course.
- Upward trending troponins proved sustained myocardial injury and echo confirmed cardiomyopathy and signs of heart failure. Cardiac catheterization ruled out ischemia.
- Elevated pressures and PCWP with severely reduced CI was diagnostic for cardiogenic shock most likely secondary to COVID-19.
- This case is a reminder that just as in other forms of viral myocarditis, cardiac catheterization in COVID-19-induced myocarditis may be unnecessary[3].

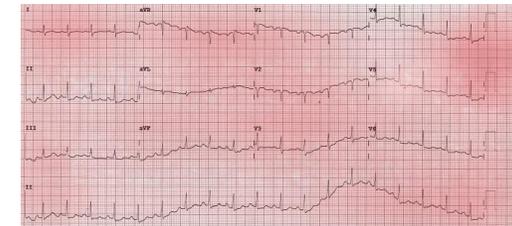


Image 1

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