Supplementary Appendix

Rationale for clinical decision-making:

1. Cardiac catheterization: Initial TTE did not show any regional wall motion abnormalities. Catheterization was deferred inpatient given the patient's body habitus and less suspicion for coronary vascular abnormalities. He was scheduled to follow cardiology as an outpatient.

2. Airway: While preparing for intubation, Personal Protective Equipment (PPE) were carefully used as per recommendations, by the American Society of Anesthesiologists and the Anesthesia Patient Safety Foundation. Predictors for difficult facemask in our patient included OSA and obesity, while predictors for difficult laryngoscopy included OSA, obesity, and a short, thick neck. Other patient considerations included hyperkalemia, current treatment for STEMI, immobility, and possible increased gastric volumes.

3. Optimal PEEP: It would have been ideal to use an esophageal balloon to measure optimal PEEP needs while on mechanical ventilation, however we did not have the availability to use this at our institution.

4. Therapeutics: Patient was unable to receive convalescent plasma and Remdesivir (Gilead, United States) due to its unavailability initially and later, he was deemed not an appropriate candidate after receiving 3 experimental doses of mesenchymal stem cells therapy, each one week apart. He was also excluded for compassionate use of Remdesivir due to being over the age of 17 after investigation with drug manufacturer. Steroids were not administered given lack of evidence of clinical significance of its use early (April 2020) in the pandemic.

5.ECMO: placement and troubleshooting: Femoral-Jugular cannulation was not preferred due to patient's body habitus. Initial ECMO flow was set to 6.0 liters/minute (LPM) with a sweep of 12 LPM. Refractory hypoxemia while on ECMO was multi-factorial, with inherent lung pathology and poor pulmonary compliance driven by body habitus and complicated by COVID-19 pneumonia.

In addition, malpositioning of venous cannula and mechanical circuit issues were first ruled out as possible etiologies prior to initiation of beta blockers to reduce intrinsic cardiac output.

6. ICU care: Palliative care team were consulted since day 10 of admission and had continued to follow patient until discharge

7. Current Clinical Status: Some members of the ICU team had arranged a visit with the patient and his mother immediately to meet and discuss post ICU care. The patient was last seen in July –August 2020 in outpatient clinics by other subspecialty services where he was ambulating using a walker, still had a tracheostomy with a speaking valve, but otherwise in good spirits, and rapidly recovering from minimal if any sequelae of the crippling illness. He continues to receive home physical therapy.

Figure S1: EKG on admission

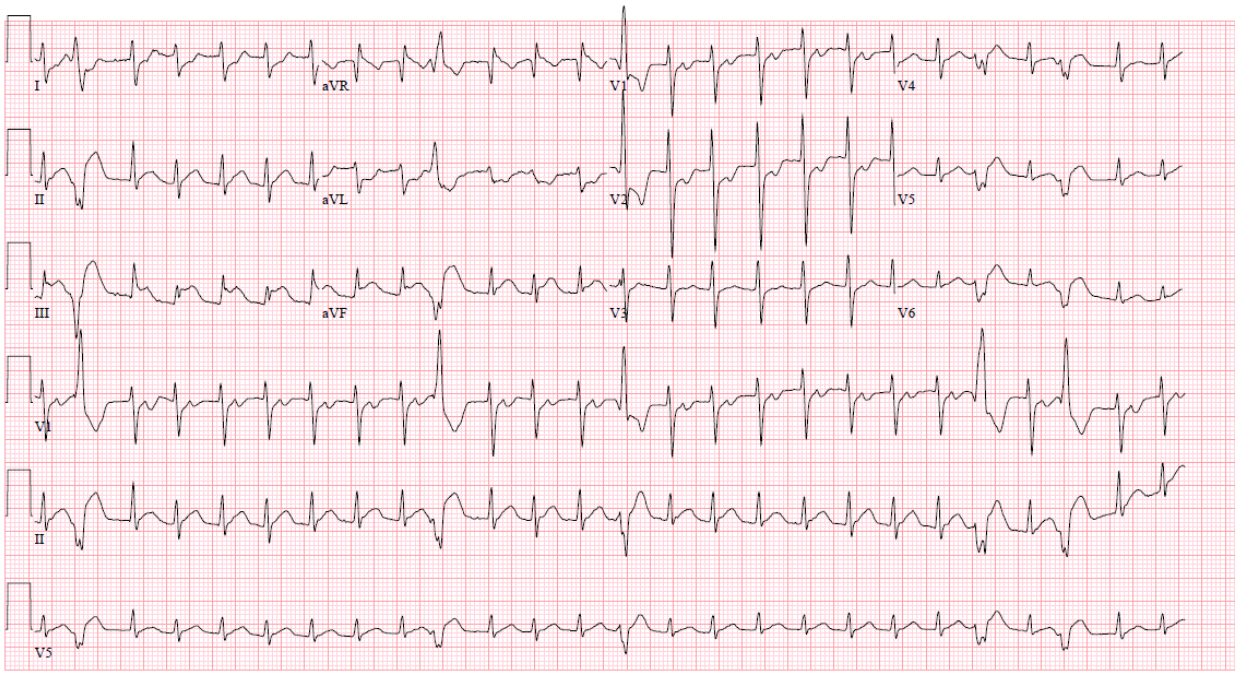

Table S1: Initial laboratory findings on admission

Laboratory study	Reference range	Results
Hemoglobin, g/dL	12.0-16.0	11.3
Hematocrit, %	37.0-47.0	38.9
White blood cell count, per pL	4000-10 800	12,700
Neutrophil count (%)	37-80	87
Absolute, 10x3/ul	2.0-6.9	11.1
Platelet count, x103/pL	130-400	294
Sodium, mEq/L	136-145	131
Potassium, mEq/L	3.4-4.5	4.6
Chloride, mEq/L	98-107	93
ALT, IU/L or U/L	32 - 91	29
AST IU/L or U/L	15 - 41	67
Calcium, mg/dL	8.60-10.20	7.8
Creatinine, mg/dL	0.60-1.00	1.1
D-dimer ng/ml	190-500	13,480
Procalcitonin ng/ml	0.0-0.2	112.3
C-reactive protein, mg/dL	<0.5	145.6
Creatine kinase-MB, ng/mL	<4.9	20.3'
Ferritin ng/ml	30-300	52
LDH, IU/L or U/L	90 - 271	682

[Abbreviations: *alt: alanine transaminase, ast: aspartate aminotransferase, ldh: lactate dehydrogenase*]