Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Summary: The patient's presentation was dramatic with cardiogenic shock and the decision was time-sensitive given the dependence on IABP. She was not an LVAD candidate given the RV failure (low PAPi). The transplant workup was done methodically yet urgently, with excellent multidisciplinary response, resulting in a successful heart transplant.

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Drugs, Bugs, and the ECMO Unplugged: A Case of a 61-year-old with Cardiogenic Shock and Utility of Palliative Bedside ECMO De-Escalation

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Introduction: Extracorporeal membrane oxygenation (ECMO) is used in the setting of cardiogenic shock for cardio-pulmonary support as a bridge to recovery, advanced therapies, or decision. However, palliation remains when other options have failed. ECMO de-cannulation is often performed in the operating room. We describe the case of a patient with palliative bedside ECMO de-escalation of care.

Case Report: A 61-year-old male with a history of chronic heart failure with reduced ejection fraction presented to an outside hospital for worsening fatigue and dyspnea. He was diagnosed with cardiogenic shock, started on dobutamine, and transferred to our hospital for consideration of advanced therapies.

On arrival, he was hypotensive with multi-organ failure and he underwent urgent bedside VA ECMO, followed by Impella CP placement for venting, as a bridge to advanced therapies. However, post-implant, the pulmonary artery pressures remained elevated and the spouse revealed that he was an active polysubstance user. His family felt that he was unable to stay away from methamphetamines. He was subsequently denied for possible transplant and LVAD. Maximization of medical therapy with hope for recovery was unsuccessful. The patient progressed to renal failure and bacteremia.

With an intact neurological status, the patient and his family, assisted by palliative care and the entire medical team, decided to pursue comfort measures. Since decannulation in the OR would require intubation, the decision to wean off ECMO bedside was made. The ECMO was dialed down to 1 LPM of flow and the patient remained alert. Impella support was dialed off and then withdrawn into descending aorta, thus avoiding aortic regurgitation, pulmonary edema, and patient distress. Finally, we clamped the ECMO cannulas and turned off the machine.

He spent time with loved ones for a few hours, laughing with family and friends prior to expiration with ongoing comfort drips.

Summary: The art of palliation for ECMO patients should be further evaluated when advanced treatments are contraindicated, especially in patients with an intact neurological status. Weaning off ECMO at the bedside can be done humanely and allow maximal time with family.

1182

A Case of Vascular Behcet's Leading to Cardiogenic Shock Requiring VA-ECMO

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Introduction: Vascular Behcet's (VB) is a rare inflammatory disorder with venous and less commonly arterial involvement. Coronary arteries are rarely involved. High clinical suspicion is required to make the diagnosis when the mucocutaneous manifestations of Behcet's are absent.

Case Report: A 45-year-old Portuguese male with prior unprovoked venous thromboembolism at the age of 30 presented with ST-elevation myocardial infarction and cardiogenic shock. Coronary angiography showed a large left main (LM) aneurysm with thrombus *(Figure 1A)*. He underwent LM balloon angioplasty and coronary artery bypass grafting. Postoperatively, he was placed on peripheral venoarterial-extracorporeal membrane oxygenation for cardiogenic shock with biventricular failure, as a bridge to decision. An intraoperative right ventricular biopsy showed only fibrinous pericarditis. He required septostomy for left ventricular decompression. Despite therapeutic heparinization, he was diagnosed with bilateral pulmonary emboli and occlusion of the common hepatic artery proper with suspected porta hepatis arterial aneurysm *(Figure 1B-C)*. He was found to carry the HLA-B51 allele and thus VB was favoured as a unifying diagnosis. Intravenous solumedrol was administered, but the patient developed anuric renal failure and limb ischemia. He ultimately succumbed to his illness due to septic shock with multiorgan failure. An autopsy confirmed the coronary aneurysm (*Figure 1D*) but could not confirm etiology. The hepatic aneurysm was not confirmed on autopsy due to technical challenges.

Summary: VB can lead to cardiac complications such as coronary aneurysms or thrombosis which may be the initial presentation in a smaller proportion of patients. Though immunosuppression is the mainstay of treatment, there is no established protocol and mortality/morbidity remain high. VB should be included in the differential diagnosis of a young patient presenting with coronary aneurysms to prompt appropriate therapy, though prognosis remains reserved.

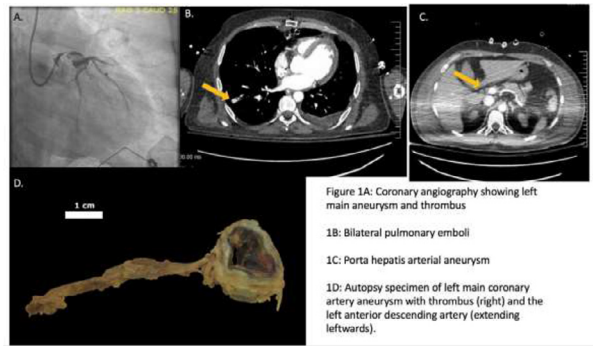

Figure 1A: Coronary angiography showing left main aneurysm and thrombus

1B: Bilateral pulmonary emboli

1C: Porta hepatis arterial aneurysm

1D: Autopsy specimen of left main coronary artery aneurysm with thrombus (right) and the left anterior descending artery (extending leftwards).

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Left Ventricular Assist Device Implantation in a COVID-19 Positive Patient

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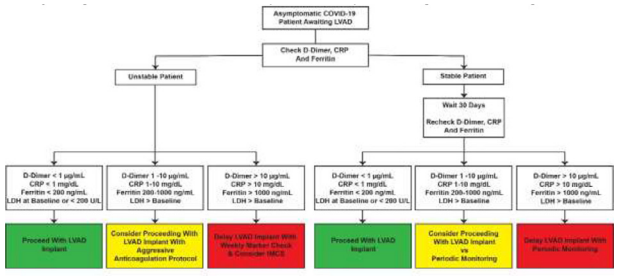
Introduction: Coronavirus disease-2019 (COVID) in patients with advanced heart failure presents unprecedented challenges in management of cardiogenic shock. Recommendations for perioperative triaging of cardiac surgery have been proposed but none regarding LVAD implantation. To our knowledge, we are the first to report on LVAD implantation in a patient with COVID and cardiogenic shock

Case Report: A 37-year-old-male with Stage D, NYHA class IV heart failure on chronic milrinone was admitted for cardiogenic shock. Despite uptitration of milrinone and addition of dobutamine,the patient remained in cardiogenic shock . Our Selection Committee discussed and approved him for an LVAD.

Institutional protocol required COVID screening prior to surgery and returned positive. Given the absence of clinical signs of COVID infection

contrasted with the severity of shock, the decision was made to proceed with implantation. Temporary mechanical support was considered but not thought to mitigate risks of thrombosis rather adding procedural risk with ECMO cannulation and left ventricular unloading. He successfully underwent LVAD implantation as INTERMACS 1. He required high doses of heparin to achieve ACT for cardiopulmonary bypass. On day 2, he developed left-sided weakness with imaging revealing multifocal acute cerebral infarcts. Despite normal LVAD function, the embolic infarcts to multiple organs led to further deterioration and death

Summary: LVAD implantation in COVID patients appears inevitable. Centers must risk stratify this cohort to reduce susceptibility to thrombosis and improve outcomes. We propose an algorithm that triages patients for elective and urgent LVAD implantation based on specific coagulation and inflammatory markers (figure 1) and have successfully implanted an LVAD in a COVID patient using this. We acknowledge this method has not been validated in a large cohort and are unable to recommend anticoagulation protocols. Further research is necessary to address safety of LVAD implantation in COVID patients



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Recovery from COVID-19 Pneumonia in a Heart Transplant Recipient

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Introduction: Solid-organ transplant patients have a high risk of severe infection related to Severe Acute Respiratory Syndrome Coronavirus-2. There are limited data on COVID-19 presentation and clinical outcome in a cardiac transplant recipient.

Case Report: A 54-year old woman a heart transplant recipient presented with symptoms of fatigue, excessive sleepiness and cough with phlegm for one week. She did not report any fever or shortness of breath. She had a heart transplant six months prior complicated by antibody-mediated rejection. She was treated with plasmapheresis, intravenous immune globulin, and high dose methylprednisolone. She could not have further scheduled RV biopsies due to the lockdown. She remained on a high dose of immune suppressive medication till her current presentation. Her medication included Prednisolone 20mg daily, Mycophenolate Mofetil (MMF) 1g bid, Tacrolimus 7 mg bid for a target FK level 10-15. On her current presentation to the hospital, she was found to be hypoxic, tachypnic, tachycardic with a BP 130/70. Her chest x-ray showed bilateral infiltrates. She had leukopenia 3.5 and lymphopenia 0.2, CRP 25, ferritin 1106, LDH 632, and IL6 87. She was started empirically on oseltamivir, vancomycin and piperacillin/tazobactam. Her COVID-19 PCR result was positive. Subsequently, she was started on Favipiravir loading of 1600 mg for two doses and a maintenance dose of 600 mg twice daily for 7 days. The MMF and tacrolimus were discontinued. The prednisone was switched to hydrocortisone 50mg IV q6h. Despite treatment, she had reduced level of consciousness and progressive bilateral lung infiltrates requiring mechanical ventilation. The multidisciplinary team discussed enrolling patients in the convalescent plasma study. The patient's family was informed and they agreed and consented to proceed with plasma therapy. Two units of compatible ABO plasma therapy was given for two consecutive days. Intravenous dexamethasone was started. She was extubated successfully after ten days. Given her marked clinical improvement, she was started on MMF 1g bid, and tacrolimus adjusted to the target FK level of 5. The patient was discharged home after three weeks of admission.

Summary: This case represents a recent heart transplant recipient who presented with COVID-19 pneumonia. Her treatment involved convalescent plasma transfusion, Favipiravir, dexamethasone, and reduction of immune suppression.

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Aortic and Renal Artery Thrombosis as the First Clinical Manifestation of COVID-19 in a Heart Transplant Recipient

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Introduction: The relation between coronavirus 2019 disease (COVID-19) and thrombotic events is well established, and both arterial and venous thrombotic events are described. Although arterial events occur in about 3.6 to 10.5% of critically ill patients, they are usually stroke or acute myocardial infarction. Arterial thrombosis of other sites is rare.

Case Report: We report a case of a 28-year-old male heart transplant recipient admitted into emergency department presenting right flank pain associated with fever, chills, nausea and vomiting for three days. Apart from diabetes mellitus and dyslipidemia, he had no other comorbidity and he was on regular immunosuppression. Physical exam revealed right costovertebral angle tenderness. Blood tests showed C-reactive protein of 317mg/dL, lactate dehydrogenase of 1827U/L, D-dimer of 4126ng/mL, ferritin of 651ng/mL and leukocytosis of 16100/mm^3. An abdominal and thoracic computed tomography scan (CT scan) revealed sparse luminal peripheral thrombi in the descending thoracic aorta. One of the thrombi extended to right renal artery ostium and caused subocclusion of the proximal segment of this artery. Right kidney presented multiple renal infarcts. Also ground-glass opacities were found in 25% of pulmonary parenchyma. COVID-19 was suspected and nasopharynx real-time fluorescence polymerase chain reaction result for SARS-CoV-2 was positive. Coagulopathy tests were performed because of atypical presentation and lupus anticoagulant (LAC) was positive. Hydration, antibiotics and anticoagulation with enoxaparin were prescribed. The patient recovered and became asymptomatic. Warfarin was prescribed and patient was discharged after 15 days of hospitalization.

Summary: This case report illustrates the heterogeneity of clinical presentation of COVID-19 and reinforces the existence of a prothrombotic state, even in the outpatient setting. Moreover, it adds information to the recent reports regarding the presence of antiphospholipid antibodies in COVID-19, although their importance in the pathophysiology of thromboembolic events in this setting is still not clear. The implication of these findings in transplant recipients is even less established, and this case report highlights the need for further research.

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COVID-19 Infection in a 13-year-old Heart Transplant Recipient in Immediate Post Transplant Period - A Case Report

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