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.

cannulated for VA-ECMO to facilitate optimization for advanced management. Prior to cannulation, bedside ultrasound revealed occlusive thrombus in both femoral and iliac veins. The venous drainage cannula was placed in the right internal jugular vein and the arterial return cannula was placed in the right common femoral artery, with antegrade reperfusion cannula. Bedside TTE was used to aide in cannula placement and cannula position was confirmed with x-ray.The patient was on VA-ECMO for 72 hours. During this time, her acidosis improved, Milrinone was weaned off, and she was diuresed. On ECMO day 3, she was taken to the OR for a pulmonary thromboendarterectomy and decannulated from VA-ECMO. The following day she was extubated and a TTE revealed improved right ventricular function.
Summary: Stabilization with VA-ECMO in patients with PE can be beneficial. This case illustrates the use of an alternative VA-ECMO cannulation strategy to optimize a patient with CTEPH. Of note, the cannulation occurred at the bedside with the use of ultrasound and without the need for intubation. Though this cannulation strategy is theoretically described in the literature, this case illustrates a concrete example of its use.

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Two Cases of Wearing an Implantable Ventricular Assist Device in the Late Postoperative Period after the Fontan Operation Two Cases of Wearing an Implantable Ventricular Assist Device in the Late Postoperative Period after the Fontan Operation

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Introduction: Advancements in perioperative management and operation methods have yielded major improvements in the mid-term postoperative results of Fontan operations. This has progressively revealed various problems such as decreased ventricular function and exercise tolerance capacity over time, along with hindrances to multiple organs throughout the body. We herein report the two cases of wearing an implantable ventricular assist device in the late postoperative period after the Fontan operation.
Case Report: [Case 1] A 13 year-old female. Her ventricular function gradually decreased following TCPC when she was four years old. She had been hospitalized multiple times due to aggravation of her cardiac insufficiency and she was fitted with a Jarvik2000 following approval of her suitability for a transplant. Her systemic venous pressure prior to the operation was 18 mmHg, CI 1.2. With a heart catheter three years after the operation, it was confirmed that she had recovered to a comparatively satisfactory Fontan circulation, with a systemic venous pressure of 8 mmHg, CI 1.8. [Case 2] An 11 year-old girl. Although she had undergone TCPC at two years of age, it was already indicated at that point that her ventricular function had decreased. A viral infection at the age of eleven further decreased her cardiac function, which required an extracorporeal LVAD-ECMO. After the operation, her physical status has recovered satisfactorily and an HVAD was implanted following approval of her suitability for a transplant. Her systemic venous pressure before the operation was 17 mmHg, CI 1.5. However, with a heart catheter three months after the operation, it was confirmed that she had recovered to a comparatively satisfactory Fontan circulation, with a systemic venous pressure of 10 mmHg, CI 2.4.
Summary: Failed Fontan circulation is primarily caused by systemic ventricular dysfunction, increases in pulmonary vascular resistance, or by a combination of the two. For cases similar to what we experienced at our facility, we can expect that cardiac assistance can improve Fontan circulation for cases in which pulmonary vascular resistance before failure of the hemodynamics is low and in which increases in pulmonary vascular resistance is reversible.

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"Clots and Failures" A Case of COVID-19 Causing STEMI and Persistent Cardiogenic Shock Ultimately Requiring LVAD

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Introduction: We present a case of COVID-19 causing hypercoagulability and inflammatory stress leading to STEMI in a patient who went on to develop persistent cardiogenic shock requiring LVA) implantation.
Case Report: 57-year-old lady developed COVID-19 infection in May 2020. In June 2020, she presented with chest pain, was noted to have STEMI on EKG, complicated by cardiac arrest with ROSC in 14 minutes. She was in cardiogenic shock as well and was started on veno-arterial ECMO. She underwent left anterior descending artery stent placement. Further hospitalization was complicated by persistent cardiogenic shock and complete heart block and underwent pacemaker and cardiac-defibrillator implantation. She developed pulmonary edema, acute kidney injury requiring hemodialysis, shock liver, and persistent cardiogenic shock. She was weaned off VA-ECMO after 4 days but continued to have severely reduced cardiac function. RHC revealed severe volume overload, pulmonary venous hypertension, low cardiac output, and right heart dysfunction. Echo showed severe LV dysfunction with an EF of 15%. A femoral intra-aortic balloon pump(IABP) was placed on July 7, 2020. An attempt was made to wean her off of IABP on July 10th,however, it was unsuccessful and she was transitioned to axillary intra-aortic balloon pump. She remained IABP dependent thereafter and on July 15th, given persistent cardiogenic shock, decision was made to pursue advanced heart failure therapies. After multi-disciplinary discussion, the decision to pursue LVAD implantation was made. She underwent a successful LVAD implantation on July 20th . She failed an extubation trial and underwent tracheostomy on July 23rd . Post LVAD, she developed atrial fibrillation and was started on digoxin and amiodarone. Her symptoms improved and she was subsequently discharged to rehabilitation in late August on amiodarone, digoxin, metoprolol, prasugrel, warfarin, spironolactone and lisinopril. The detailed timeline is shown in figure 1.
Summary: Hypercoagulability and severe inflammatory stress leading to life-threatening illness is a significant complication of COVID-19 infection. A low threshold for suspecting and treating hypercoagulability and inflammatory induced myocardial ischemia and injury and cardiogenic shock is a reasonable strategy to decrease acute as well as chronic morbidity and mortality.

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Sustained Ventricular Fibrillation in a Conscious Pediatric LVAD Patient

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Introduction: Non-sustained ventricular tachycardia (NSVT), defined by ventricular tachycardia lasting less than 30 seconds, is common in patients with left ventricular assist devices (LVADs). Ventricular tachy-arrhythmias (VAs) such as sustained ventricular tachycardia (VT) and ventricular fibrillation (VF) are uncommon but carry a significant risk of morbidity and death.
Case Report: A 16-year-old male underwent continuous flow LVAD implantation after presenting with end stage heart failure due to dilated cardiomyopathy. Prior to LVAD, he had an increasing burden of NSVT, which improved post-LVAD insertion. On post-op day 11, he developed palpitations related to sinus tachycardia and monomorphic NSVT. He remained conscious with clinical signs of adequate peripheral perfusion. The VAD flows fell from 5.2 L/min to 1.9 L/min secondary to the effects of the VA on the right ventricle (RV). The VAs then deteriorated into sustained polymorphic VT followed by VF (*Image 1*). He continued to answer questions appropriately but complained of dizziness and visual changes. Medical management included lidocaine, calcium, magnesium, amiodarone, and epinephrine for RV support. In addition, he received 4 defibrillations, the last of which successfully converted him to sinus rhythm. He did not require chest compressions and maintained adequate cardiac output throughout. He underwent cardiac catheterization which confirmed normal coronary arteries and enabled optimization of LVAD settings. He was discharged home 15 days later on LVAD support, with amiodarone, metoprolol and a home automated external defibrillator. He remains well 10 months later with no further events.
Summary: VF, a potentially life-threatening arrhythmia, was remarkably well tolerated in a teenager on LVAD support despite some evidence of RV compromise. This case highlights the importance of improved risk stratification of NSVTs in the LVAD population to establish the need for anti-arrhythmic medication or implantable cardioverter-defibrillator.