De novo subcutaneous implantable cardioverter-defibrillator in patient with left ventricular assist device

Left ventricular assist devices (LVADs) are increasingly being used as a destination therapy and bridge to transplant in patients with advanced heart failure and cardiomyopathy. LVADs create electromagnetic interference (EMI) that can result in both inhibition of pacing and inappropriate implantable cardioverter-defibrillator (ICD) shocks. In patients who do not require pacing, subcutaneous ICDs (S-ICDs) are a nonvascular alternative, but little is known about their use and function in patients with an LVAD. Reichert et al (HeartRhythm Case Rep https://doi.org/10.1016/j.hrcr.2020.07.020) share the case of a 77-year-old man with a HeartMate II LVAD and severe heart failure. The LVAD had been implanted in India, without an ICD implant, and the patient presented after a low flow alarm due to pump thrombus. A pocket infection was diagnosed at the time of surgery to replace the pump. His postoperative course was notable for ventricular fibrillation requiring defibrillation. Due to concerns for infection, an S-ICD was implanted with a lateral incision to allow a 11-cm distance between the S-ICD and the LVAD. Defibrillation threshold testing was favorable. No significant EMI was detected in any sensing vectors, and no inappropriate therapies were delivered during 12 months of follow-up. This case shows the potential use of the S-ICD in patients with an LVAD.

Rhythm, conduction, and ST elevation with COVID-19: Myocarditis or myocardial infarction?

Coronavirus disease 2019 (COVID-19) presents with a wide range of manifestations that span from an asymptomatic state to severe systemic multiorgan failure. COVID-19 often is worse in the aged and those with coexistent systemic diseases. There is an evolving understanding of cardiac manifestations from COVID-19, and it remains a challenge at times to sort out what is directly attributed to the virus vs other diseases. Mansoor et al (HeartRhythm Case Rep https://doi.org/10.1016/j.hrcr.2020.08.001) share the case of a 77-year-old woman with a history of hypertension who presented with fever, tachypnea, and hypoxia. She was intubated and transferred to the intensive care unit. Laboratory tests revealed severely elevated inflammatory markers and lactate of 4.2 mmol/L. Six days after admission, she developed hypotension requiring inotropic support, and high-sensitivity troponin T was elevated at 118 ng/L. She had mild left ventricular dysfunction on echocardiogram. Rhythm manifestations included accelerated idioventricular rhythm second-degree heart block followed by severe ST depressions across the precordium. She was considered to be too high risk for angiography, and intravenous heparin was not administered due to anemia. Rhythm disturbances progressed to right bundle branch block and then complete heart block. Myocarditis was suspected. Pulse-dose steroids and intravenous immunoglobulin therapy were administered without improvement, and the patient died. This case highlights the severe systemic manifestations of COVID-19 and the evolution of mechanical and electrical cardiac disease that may reflect myocarditis vs a diffuse hypercoagulable state.

High-grade heart block requiring transvenous pacing associated with multisystem inflammatory syndrome in children during the COVID-19 pandemic

Multisystem inflammatory syndrome in children has recently been described in pediatric patients with COVID-19. Multisystem inflammatory syndrome can result in myocarditis, but to date few data regarding the electrical manifestations of the disease have been reported. Domico et al (HeartRhythm Case Rep https://doi.org/10.1016/j.hrcr.2020.08.015) share the case of a previously healthy 11-year-old boy who presented with a cough, fever, and dyspnea. Initial chest radiograph showed a right-sided multifocal pneumonia. Baseline markers of inflammation were severely elevated, and the result of initial coronavirus polymerase chain reaction test was negative. The patient progressed to hypoxia and hypotension. Antibiotic treatment was initiated with azithromycin and broadened to include levofloxacin and linezolid. He received 2 mg/kg of intravenous immunoglobulin (IVIG) and medium-dose aspirin. He progressed to vasogenic shock with an elevated lactate. Imaging showed dilated coronary arteries and bilateral pulmonary effusions. He was intubated. On hospital day 4, he developed bradycardia with intermittent first- and second-degree AV block with varying QRS morphologies and paroxysms of an idioventricular rhythm. He was emergently paced at 110 bpm using a temporary transvenous catheter. Methylprednisolone 1 g was given, and antibiotics were changed to cefaroline and doxycycline. Although his clinical status improved, he developed aneurysmal changes to the right and left coronary arteries. This is the first case report of severe conduction system disease and cardiac involvement in multisystem inflammatory syndrome in children during the COVID-19 pandemic.