

## EP News: Case Reports

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### Inpatient use of mobile continuous telemetry for COVID-19 patients treated with hydroxychloroquine and azithromycin

Coronavirus disease 2019 (COVID-19) is highly infectious and causes significant strains on health care systems. Routine testing within the hospital is weighed for needed value to minimize exposure to staff. The combination of hydroxychloroquine and azithromycin, both known to prolong the QT interval, was shown to lower the viral load, and early in the COVID-19 pandemic, the drugs were used to try to lower the morbidity and mortality of the infection. Gabriels et al (doi: <https://doi.org/10.1016/j.hrct.2020.03.017>) shared a case of a 72-year-old woman with paroxysmal atrial fibrillation, treated with flecainide and metoprolol, who presented with dyspnea, cough, fevers, and chills. A chest radiograph noted multifocal pneumonia, and a nasopharyngeal swab tested positive for COVID-19. She was treated with 400 mg of hydroxychloroquine twice daily on 1 day, followed by 200 mg twice daily, and 500 mg of intravenous azithromycin daily.

Her admission electrocardiogram showed sinus rhythm with an interventricular conduction delay (QRS duration 128 ms) and a corrected QT (QTc) duration of 458 ms. On day 2, both her QRS (160 ms) and QT (470 ms) durations had increased. Because of the pandemic, no telemetry beds were available, and mobile telemetry was initiated to continuously monitor her QT interval. Using this system, the QRS and QTc durations were measured at 160 and 520 ms, respectively. These durations remained stable throughout her therapy course, and no ventricular arrhythmia events were recorded. This case highlights the use of routine ambulatory monitors within a hospital setting and that the QTc duration data and dynamic changes can be measured relatively accurately.

### The case for quinidine: Management of electrical storm in refractory ventricular fibrillation

Idiopathic ventricular fibrillation (VF) is often associated with short-coupled premature ventricular contractions (PVCs) from the distal Purkinje fiber network. Refractory VF that presents in storm has a high rate of morbidity and mortality despite access

of the hemodynamic support devices. Quinidine is a class 1a sodium channel blocker that reduces the inward (IK<sub>1</sub>) and outward (IK<sub>to</sub>) potassium currents. Pinnelas et al (doi: <https://doi.org/10.1016/j.hrct.2020.03.005>) shared a case of a 27-year-old previously healthy woman who had an out-of-hospital cardiac arrest. She was successfully resuscitated and upon admission had frequent short-coupled PVCs. An angiogram was normal. She developed VF refractory to magnesium, amiodarone, lidocaine, and esmolol and was placed on extracorporeal membrane oxygenation and therapeutic hypothermia. Remarkably, she remained in VF for 8 hours despite >20 defibrillation attempts. She was given 2 boluses of quinidine 300 mg intravenously; sinus rhythm was restored with a single shock; and she remained in sinus without PVCs during transmission to oral quinidine. Structural and genetic testing did not uncover known abnormalities. As quinidine reduces both IK<sub>1</sub> and IK<sub>to</sub>, the drug may preferentially be effective in idiopathic VF felt to be related to phase 2 reentry and a reduction in the dispersion of repolarization. These cases highlight the need to make intravenous quinidine once again available for cardiac arrhythmias and severe cases of malaria.

### Targeting an electrotonic effect with ablation: Management of a symptomatic long PR interval

An uncommon manifestation of dual atrioventricular (AV) nodal physiology is a symptomatic prolonged PR interval and symptoms of pseudo-pacemaker syndrome. Persistent conduction over the prolonged slow pathway is felt to be due to retrograde concealed conduction into the fast pathway. Laslett et al (doi: <https://doi.org/10.1016/j.hrct.2020.03.014>) shared a case of a previously healthy 28-year-old man with fatigue, dyspnea, and palpitations with a resting PR interval of 460 ms. During exercise, his PR interval was at the upper limit of normal, a finding similar to the beat following occasional blocked premature atrial contractions. An electrophysiology study was performed due to the suspicion of dual AV nodal physiology. During a second application of cryothermal energy, the AH interval shortened from 300 to 168 ms. Additional cryothermal energy applications were performed with further shortening of the PR interval to 110 ms. A month later, the PR interval had prolonged to 250 ms, and on monitoring, 2 PR intervals were present; however, the symptoms of prior AV nodal physiology had improved greatly, so no additional treatment was pursued. This case shows the potential use of slow pathway modification/ablation in patients with a symptomatic long PR interval in which dual AV nodal physiology, or variants in physiology, is suspected.

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