Transient Brugada-like ECG pattern in a patient with Coronavirus Disease 2019 (COVID-19)

Mladen I. Vidovich, MD, FACC, FSCAI

PII: S2666-0849(20)30366-1
DOI: https://doi.org/10.1016/j.jaccas.2020.04.007
Reference: JACCAS 456

To appear in: JACC Case Reports

Received Date: 8 April 2020
Accepted Date: 10 April 2020

Please cite this article as: Vidovich MI, Transient Brugada-like ECG pattern in a patient with Coronavirus Disease 2019 (COVID-19), JACC Case Reports (2020), doi: https://doi.org/10.1016/j.jaccas.2020.04.007.

This is a PDF file of an article that has undergone enhancements after acceptance, such as the addition of a cover page and metadata, and formatting for readability, but it is not yet the definitive version of record. This version will undergo additional copyediting, typesetting and review before it is published in its final form, but we are providing this version to give early visibility of the article. Please note that, during the production process, errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

© 2020 Published by Elsevier on behalf of the American College of Cardiology Foundation.
Transient Brugada-like ECG pattern in a patient with Coronavirus Disease 2019 (COVID-19)

Mladen I. Vidovich, MD, FACC, FSCAI
Professor of Medicine
University of Illinois at Chicago, Chicago, Illinois

Address for correspondence:
840 S Wood St, Suite 935
Chicago, IL 60612
Phone 312-413-4951
miv@uic.edu
@mividovich

Conflict of interest:
Merit Medical – Royalty Payments, Boston Scientific – Research Grant.
None related to this publication.
A 61-year-old Hispanic male presented to the Emergency Department with a 5-day history of shortness of breath and substernal chest pain. He had felt febrile and generally ill over the past few days but had not taken his temperature. Upon presentation, he was febrile (38.5 C), hypertensive (156/81 mmHg), tachycardic (121 beats/min) and tachypneic (28 breaths/min).

His past medical history was significant for hepatitis C, dermatitis and obesity. The patient did not report history of syncope and there was family history of sudden cardiac death. Laboratory data demonstrated mild hyponatremia (132 mmol/L), potassium (4.0 mmol/L) and magnesium (2.5 mmol/L) in the normal range and mild hypocalcemia (8.3 mmol/L). The C-reactive protein was 150.7 mg/L and brain natriuretic peptide 19 pg/mL. The remainder of the laboratory values were unremarkable, and the troponin level was normal. His medications included clobetasol and triamcinolone ointments. The portable chest x-ray showed multifocal bilateral interstitial and airspace opacities with a normal cardiac silhouette (Figure 1).

The electrocardiogram showed a Brugada-type pattern in right precordial leads with no reciprocal changes (Figure 2). A bedside echocardiogram demonstrated mildly depressed global ejection fraction. Based on the clinical constellation of symptoms along with reduced ejection fraction and ST elevation we proceeded with emergency coronary angiography.

Diagnostic coronary angiography performed via right radial approach revealed angiographically normal coronaries (Figures 3 and 4). Ventriculography confirmed the globally mildly reduced ejection fraction.

The patient was admitted to a dedicated COVID-19 intensive care unit. The COVID-19 results became available within 24 hours and were positive. His condition continued to improve, and he required minimal supplemental oxygen to maintain arterial saturation. All serial troponins values were negative. Two days later he developed a brief episode of supraventricular
tachycardia that was successfully terminated with intravenous adenosine (Figure 5).

Four days after the initial presentation, he was doing well without fever. The CRP had decreased to 25.4 mg/L and the ECG demonstrated near complete resolution of the initial Brugada-like ECG pattern (Figure 6). The patient was discharged to home after the one-week hospital stay.

Diagnosis and treatment of ST elevation myocardial infarction during the COVID-19 pandemic presents multiple diagnostic and logistic challenges. (1) Myocardial injury, myocarditis, acute coronary syndromes and arrhythmias have all been described in the setting of COVID-19 infection. (2) ST elevation in right precordial leads and Brugada-like ECG patterns have previously been described associated with various conditions (e.g., fever, myocarditis toxicity, metabolic disorders, certain drugs). These Brugada-like patterns usually disappear once the inciting event is removed. (3) Brugada-like ECG pattern presents an additional diagnostic and therapeutic challenge as it may be present in patients presenting with chest pain thus mimicking ST elevation. Atrioventricular nodal reentrant tachycardia (AVNRT) that our patient developed has similarly been associated with Brugada syndrome. (4) Most recently, COVID-19 infection has been described as unmasking Brugada syndrome in a patient who presented with syncope. (5)

Our case is important as it demonstrates the need to differentiate between the Brugada syndrome and the Brugada-like ECG morphology. Given that our patient had COVID-19-associated Brugada electrocardiographic pattern with no history of syncope, observation therapy was recommended as the risk of major adverse cardiac events is low (6).
References


Figure Legends

**Figure 1.** Portable Chest X-ray demonstrating diffuse bilateral interstitial pattern

**Figure 2.** ECG demonstrating Brugada Type I pattern. Note the absence of reciprocal changes.

**Figure 3.** ECG demonstrating resolution of Brugada-like pattern in right precordial leads.

**Figure 4.** Narrow complex tachycardia with Brugada Type I pattern

**Figure 5.** Angiographically normal dominant right coronary artery.

**Figure 6.** Angiographically normal left coronary system.