



## Clinical Communications: Adult

### STEMI Mimic: Focal Myocarditis in an Adolescent Patient After mRNA COVID-19 Vaccine

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**Abstract—***Background:* In May 2021, the U.S. Food and Drug Administration expanded the Emergency Use Authorization for the Pfizer-BioNTech mRNA Coronavirus disease 2019 (COVID-19) Vaccine (BNT162b2) to include adolescents 12–15 years of age. As vaccine administration continues to increase, potential adverse outcomes, to include myocarditis, are being reported to the Vaccine Adverse Event Reporting System. *Case Report:* This case report describes a 17-year-old male patient who developed focal myocarditis mimicking an ST-segment elevation myocardial infarction (STEMI) 3 days after administration of an mRNA COVID-19 vaccine. *Why Should an Emergency Physician Be Aware of This?* Myocarditis is a rare complication in adolescents receiving mRNA COVID-19 vaccines. Focal myocarditis may demonstrate localizing electrocardiographic changes consistent with a STEMI. Overall, complications of the mRNA COVID-19 vaccines are extremely rare. The vaccine continues to be recommended by public health experts, as the benefits of vaccinations greatly outweigh the rare side effects. Published by Elsevier Inc.

**Keywords—**myocarditis; mRNA vaccine; BNT162b2; COVID-19; STEMI

#### Introduction

After a cluster of patients developing pneumonia and viral prodromal symptoms in Wuhan, China, a novel coronavirus, ultimately deemed severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was discovered (1,2). After over a year of causing unprecedented death, disease, and economic collapse, the first vaccine in America was given in New York City on December 14, 2020. Initially, this vaccine was only approved for adults ages 18 years and older, however, effective May 2021, the Emergency Use Authorization was amended to allow the BNT162b2 SARS-CoV-2 vaccination to be administered to those between the ages of 12 and 18 years old (3). As of June 27, 2021, over 323,000,000 vaccines have been administered in the United States, with the majority being the mRNA subtype. Adverse outcomes of the mRNA COVID-19 vaccines are rare but do include myocarditis, anaphylaxis, and death (4). Sparse evidence exists regarding the incidence of myocarditis after mRNA vaccination, however, cases are beginning to be reported (5,6). With the exception of the smallpox vaccination, post-vaccination myocarditis is thought to be a relatively rare occurrence (5,7). We present a case of focal myocarditis mimicking an ST-segment elevation myocardial infarction.

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