



## ST Elevated Myocardial Infarction in Young Post COVID 19 Vaccination - Coincidence or Side Effect

Authors

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### Abstract

*We present the case of 29 yr male, with no known cardiac history, who suffered a MI 12 hour after his first dose covaxin (COVID-19) vaccination. He was medically managed and PCI was done to LAD. It is early to draw a link between COVID-19 vaccine and myocardial infarction*

**Keywords:** COVID-19 vaccine, ST elevated myocardial infarction.

### Introduction

The Coronavirus disease 2019 (COVID-19) vaccine was granted emergency authorization use on December 18, 2020, based on strong phase three study data<sup>[1]</sup>. COVID vaccine reported a 1% serious adverse event rate in both the vaccinated group and the control group<sup>[2]</sup>. These serious adverse events were defined as death, a life-threatening adverse event, in patient hospitalization, a persistent or significant disruption to conduct normal life functions, or a congenital abnormality or birth defect<sup>[1]</sup>. They also reported no difference in thrombotic events between groups<sup>[2]</sup>. There are minimal published reports in the literature of serious adverse reactions to date<sup>[3,4]</sup>. This case report presents a potential serious adverse reaction and explores whether we can attribute a serious adverse reaction to the COVID-19 vaccine.

### Case Description

**History of Presentation:** A 29year old male farmer by occupation presented to our emergency

department with complain chest pain and epigastric discomfort and dyspnoea on exertion which started approximately 12 hour after 1<sup>st</sup> dose of COVID vaccine BBV152 (covaxin). Patient presented to our emergency department 8 hour after onset of symptoms. Chest pain radiated to his left shoulder and associated with palpitation and sweating. He denied loss of consciousness, headache, nausea or vomiting.

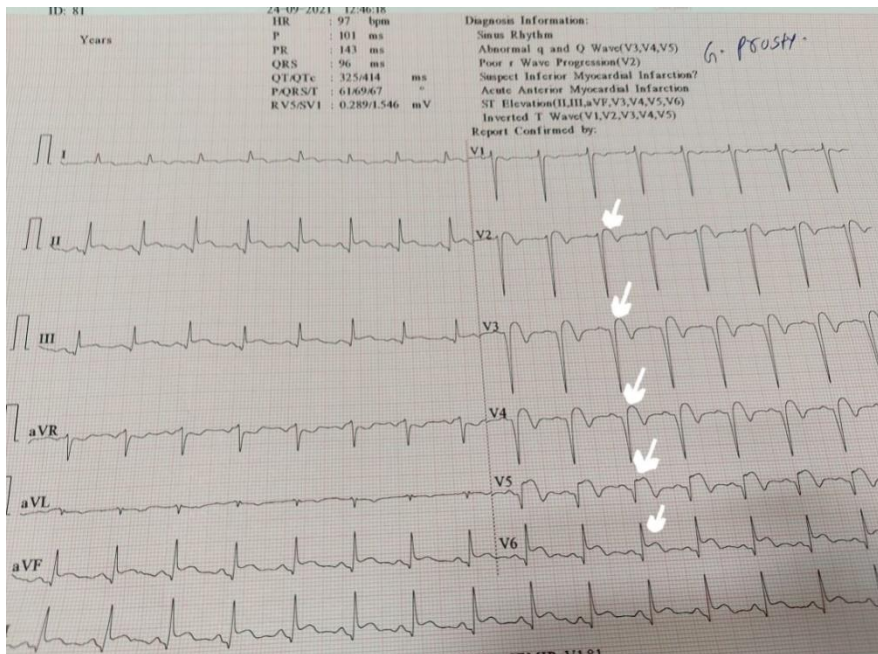
**Past Medical History:** No previous history of coronary artery disease or allergic reaction to any substances. He had never smoked and denied alcohol consumption. There was also no family history of coronary artery disease or any sudden cardiac death.

**Investigations:** ECG was done which ST elevation from V2 to V6 with T wave inversion from V2 TO V5 (Figure 1). Bedside echocardiography showed an anterior and apical wall motion abnormality and moderate systolic dysfunction of left ventricle with LVEF-43.7% through global longitudinal strain (GLS) (Figure 2). High-sensitivity cardiac troponin T test (hs-

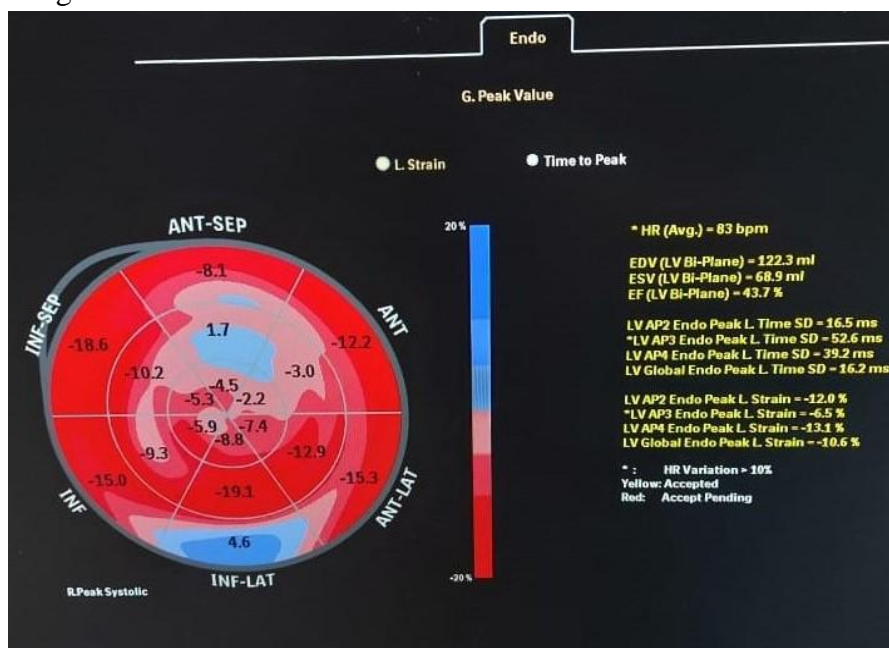
cTnT) was 250 ng/L. Routine investigations (complete hemogram, liver function test, renal function test, lipid profile, thyroid function test, fasting and post-prandial blood sugar, glycated haemoglobin, coagulation profile, urine examination, serum electrolytes, chest X-ray, ultrasonography whole abdomen) were within normal limit Coronary angiography showed a critical stenosis of proximal and mid segment of left anterior descending artery(LAD) (Figure 3(a)).

**Management** So it was treated as a case of ST elevation myocardial infarction (STEMI) with dual antiplatelet and heparin. Percutaneous coronary intervention was done to LAD with drug eluting stent (DES) was placed with Thrombolysis In Myocardial Infarction III flow (TIMI III flow) (Figure 3(b)) was achieved post stenting. There was no recurrent chest pain or arrhythmia. Patient was discharged after 3 days.

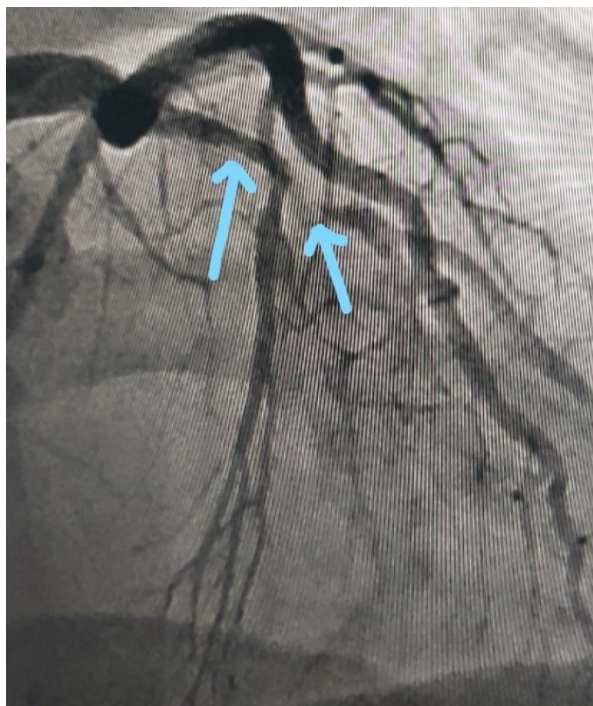
**Follow-up:** first follow up was done after 2 weeks patient was symptoms free and ECG showed no new changes.



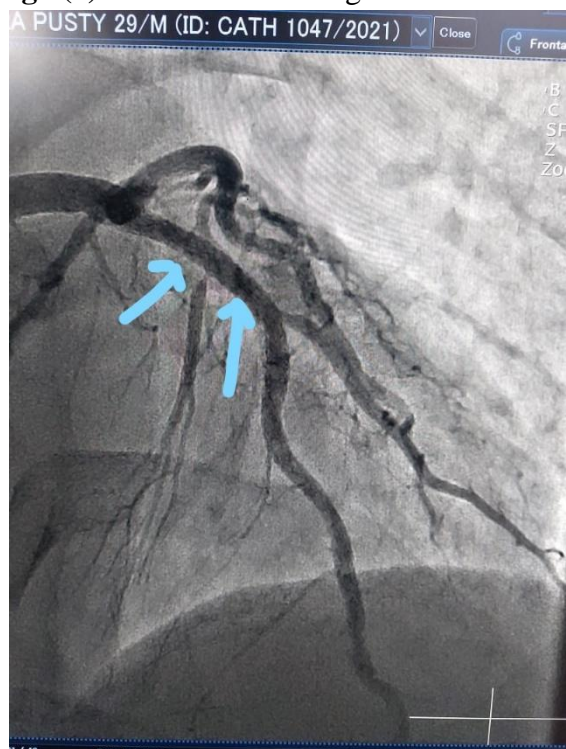
**Fig 1:** ECG showing st elevation V2 to V6 and t wave inversion V2 to V5 marked with white arrow.



**Fig 2:** ECHO GLS showing hypokinesia in anterior and apical area and LVEF43.7%.



**Fig 3(a)** blue arrow showing stenosis in LAD



**Fig 3(b)** blue arrow showing DES and TIMI-III flow after stenting

### Discussion

This case explores an unfortunate MI after the COVAXIN vaccine. As at this point there is no experiment done to specifically investigate the incidence of MI among COVID-19 vaccine recipients, some hypotheses can be put forward. Firstly, Greinacher et al. suggested vaccine

induced prothrombotic immune thrombocytopenia, an entity similar to heparin induced thrombocytopenia as the reason behind thrombotic phenomenon post-vaccination<sup>[5]</sup> Secondly, Boivin et al. stated demand-supply mismatch in a frail heart post-vaccination<sup>[6]</sup> article report a case of 96-year-old woman who experienced a STEMI 1 hour after her first Moderna COVID-19 vaccination. Another case was reported in India of a STEMI two days post AZD1222 vaccine in a healthy 63-year-old man. Another case of 62 old women 1.5 hr after AZD1222 vaccine in Kuwait. Our case is probably fourth reported case in the literature of a myocardial infarction after (BBV152) COVID-19 vaccine. Thirdly, transfection of platelets by mRNA or viral vector-based vaccine may be remote possibility<sup>[7]</sup>. Fourthly, it can be vasospastic allergic myocardial infarction in response to vaccine, termed as Kunis syndrome [8,9].

### Conclusion

We report a case of an MI after the first dose of the Covaxin COVID-19 vaccine. Until there are additional data released from the vaccine manufacturers, or there are an increasing number of case reports or case series detailing more serious side effects, we will be unlikely to determine whether there is a significant risk for adult receiving the vaccine. In the meantime, healthcare providers should be aware that there might be false or overstated reports of danger from the COVID-19 vaccine, which could incite a rush to judgement by the general public. Any research on the topic should be written carefully and avoid overstating the findings. Additionally, as a precautionary measure, providers should consider additional screenings for older adults prior to COVID-19 vaccine.

### Learning Objectives

1. COVID 19 vaccine as a independent risk factor for myocardial infarction.



- To understand the temporal relation between COVID vaccine timing and acute coronary syndrome.

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## Abbreviations

COVID-19: Coronavirus disease 2019

GLS: Global longitudinal strain

hs-cTnT: High-sensitivity cardiac troponin T test

STEMI: ST elevation myocardial infarction

LAD: left anterior descending artery

DES: drug eluting stent

TIMI III flow: Thrombolysis In Myocardial Infarction III flow

PCI: Percutaneous coronary intervention.