



## Case Report

**Clinical Manifestation and Outcomes of Thrombolytic and Conservative Therapy in COVID-19 Patients with ST-Segment Elvation Pattern: A Case Series**Raditya Rizki Muhammad<sup>1</sup>, Nadya Anisah<sup>1</sup>, Hairudi S.<sup>2</sup>, Arief Bowo K.<sup>2</sup><sup>1</sup>General Practitioner, Sidoarjo General Hospital, Sidoarjo, East Java, Indonesia.<sup>2</sup>Cardiologist, Sidoarjo General Hospital, Sidoarjo, East Java, Indonesia.**ARTICLE INFO***Article history:*

Reviewed July-August 2021

Available online September 2021

*\*Corresponding author:*

radityarizki25@gmail.com

*Keywords:*COVID-19  
ST-segment Elevation  
Thrombolytic**ABSTRACT**

COVID-19 pandemic has become a global issues, especially involving cardiovascular diseases. The management of COVID-19 patients with ST-Segment elevation in early pandemic era faces new challenges. Challenges can occur in term of patient's delay and healthcare safety. This case series discussed clinical manifestations, examination findings, alternative strategies including thrombolytic and conservative therapy, and patients' outcomes.

**Introduction**

Patients with Coronavirus disease-2019 (COVID-19) present respiratory symptoms and less commonly develop myocardial injury with ST-segment Elevation, including ST-segment Elevation Myocardial Infarction (STEMI). The management of STEMI as a cardiovascular emergency in COVID-19 era has been linked to time reperfusion delay due to patients' delay to visit the hospital and new health protocol.

**Case Presentation**

We identified four patients with confirmed COVID-19 who had ST-segment elevation, indicating potential acute myocardial infarction.

**Case 1**

The first patient was a 44-yr-old-woman with history of diabetes melitus complained severe nausea and vomiting since two hours prior. Her electrocardiography showed inferior leads ST-segment elevation (Figure 1) and bilateral pneumonia on thorax x-ray. She was given dual antiplatelet, thrombolytic therapy, and anticoagulant. The patient developed an improvement and discharged on day eight.

**Case 2**

A-62-yr-old-man with history of CVA and chronic kidney disease had severe dyspnea since two days before. Thorax x-ray showed acute lung edema and pneumonia. The ECG showed anteroseptal leads ST-segment elevation (figure 2), and significant

elevation of high sensitive troponin T. Conservative therapy was given due to late onset. Patient revealed improvement and discharged after 12 days.

#### Case 3

A-64-yr-old-man came to the emergency room with severe dyspneu and diagnosed with pneumonia. He showed anterior extensive ST-segment elevation acute respiratory distress syndrome seven days after the first onset. Dual antiplatelets, anticoagulant, and other conservative therapy were given. The patients was intubated and died on the next day due to respiratory failure.

#### Case 4

The last case was a a-60-yr-old-man with dyspneu, acute respiratory distress syndrome, and cardiogenic shock. He showed pneumonia on radiological examintaion and his ecg showed anterior leads ST-segment elevation. He was treated with dobutamine, norepinephrine, dual antiplatelets, thrombolytic therapy, and anticoagulant. The patients died on the next day.

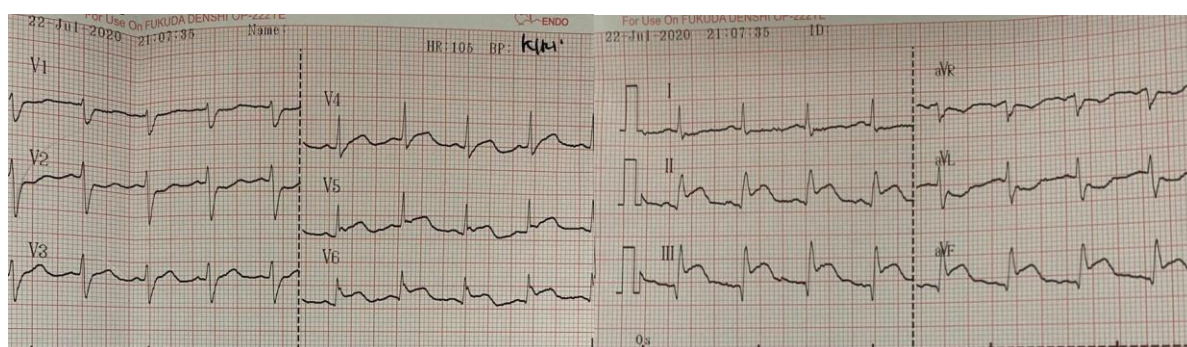


Figure 1: A 12-lead ECG from first patient showed inferior ST-elevation

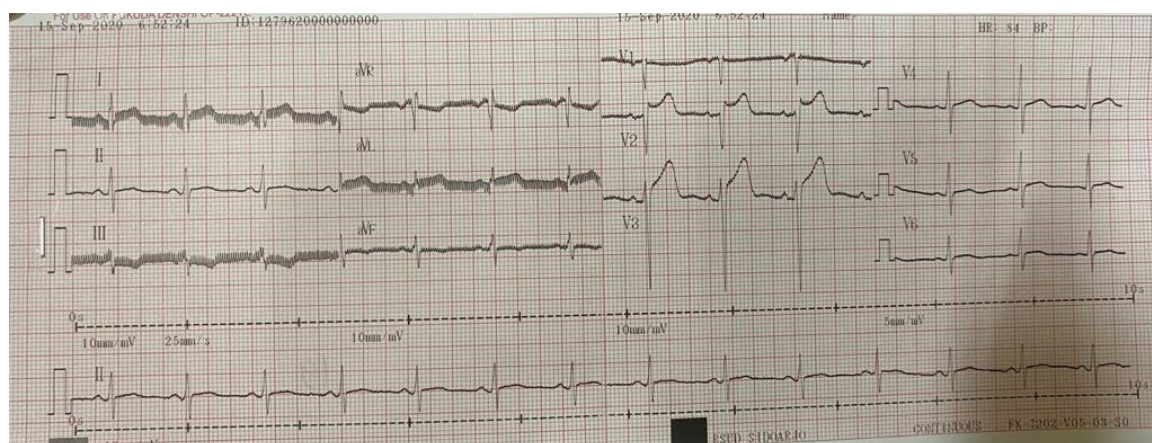


Figure 2: A 12-lead ECG from second patient showed anteroapical ST-elevation



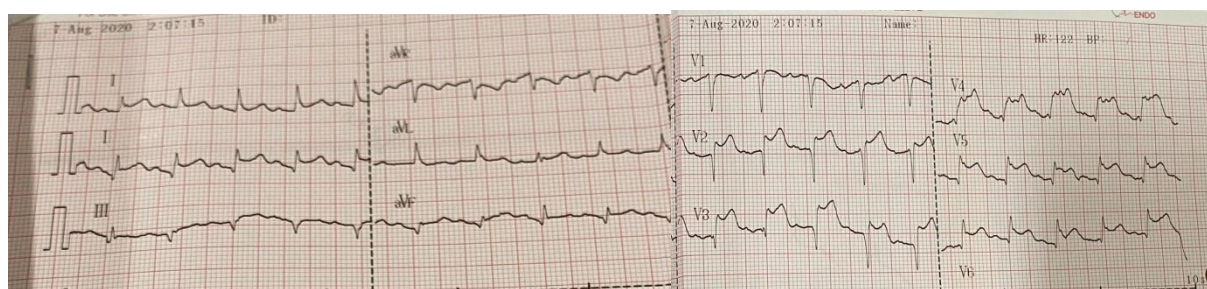


Figure 3: A 12-lead ECG from third patient showed anterior extensive ST-elevation

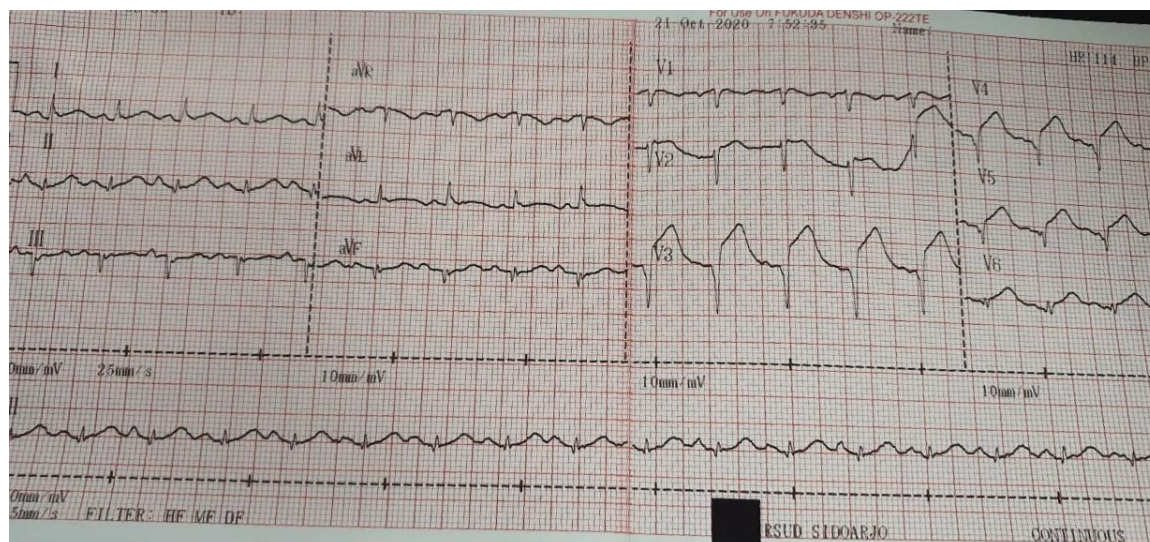


Figure 4: A 12-lead ECG from fourth patient showed anterior ST-elevation

## Discussion

In this series of COVID-19 patients who experience ST-segment elevation, there are variabilities in presentation, clinical challenges, and logistics in treatment [1]. We studied that the the ST segment elevation in the COVID-19 era could represent both obstructive and non-obstructive disease due to STEMI-mimics [4]. The presence of STEMI mimics, such as myopericarditis, is not uncommon. COVID-19 has introduced new clinical and logistical challenges in the treatment associated with primary infections, hemodynamics, and respiratory problems. Diagnosis and management in emergency setting are critical to improve patient outcomes [3]. During the current outbreak, an alternative treatment of STEMI was thrombolytic

therapy to PCI. In a study conducted by Bangalore et al. and Stefanini et al. (2020), approximately 60% of STEMI COVID-19 patients have identified occlusion on angiography. Administration of thrombolytic therapy in patients without lesions may cause bleeding complications without achieving reperfusion at the epicardial level. However, this is an exception if the goal of fibrinolytic therapy is to target other COVID-19-related pathophysiological explanations of STEMI such as in situ thrombosis or microvascular obstruction; to date, the specific role of thrombolytic therapy in this situation remains unproven [2].

In a study conducted by Xiang et al., it was observed that there was a decrease in the number

of STEMI cases hospitalized. The reduction in the timeliness of reperfusion during the pandemic is likely to be further exacerbated in health care systems with limited access to PPCI. Despite protocol-based recommendations for changing the thrombolytic therapy strategy to reduce this reperfusion delay, increased mortality and heart failure are still observed. [2]

## Conclusion

The therapeutic approach of COVID-19 patients with ST-segment elevation faces new challenges involving health workers' safety and patients' condition. Multidisciplinary efforts are required to improve patients' outcomes. The therapeutic approach for each case is different, and therapies for the underlying disease are still being developed.

## Acknowledgement

There is no conflict of interest.

## References

1. Daniels M.J., Cohen M.G., Bavry A.A., Kumbhani D.J. 2020. Reperfusion of STEMI in the COVID-19 era-business as usual? *Circulation* 141:1948–1950.
2. Lauren S. R., Sahil A.P., Ajay J.K. 2020. COVID-19 Specific Strategies for the Treatment of ST-Segment Elevation Myocardial Infarction in China. *J Am Coll Cardiol* 76;(11):1325-1327.
3. Pinto D. 2020. COVID-19: Myocardial infarction and other coronary artery disease issues. [Uptodate.searchbox.science](https://www.uptodate.com/contents/covid-19-myocardial-infarction-and-other-coronary-artery-disease-issues).
4. Welt F.G., Shah P.B., Aronow H.D., et al. 2020. Catheterization laboratory considerations during the coronavirus (COVID-19) pandemic: from ACC's Interventional Council and SCAI. *J Am Coll Cardiol* 75:2372–2375.