

Percutaneous Coronary Intervention in Single Coronary Ostium Presented with STEMI: A Case Report

Jefri¹, Wahidji V²

¹Department of Cardiology, Faculty of Medicine, University Sam Ratulangi, Manado, Indonesia

²Department of Cardiology, Prof. Dr. H. Aloei Saboe General Hospital, Gorontalo, Indonesia

*Corresponding Author. Email: jefri_md@yahoo.com, Telp: +6281318899122

ABSTRACT

Introduction: Coronary artery anomalies presenting with ST-segment elevation myocardial infarction (STEMI) are uncommon and often are challenging to manage. We report a case of a successful percutaneous coronary intervention (PCI) of the right coronary artery (RCA) in a patient who presented with inferior STEMI and an anomaly of the left and right coronary arteries with a single coronary ostium in the right sinus of Valsalva.

Case: Male, 71 years old, was admitted to the emergency department with 8 hours onset of chest pain. The patient was diagnosed with STEMI Inferior 8 hours of onset Killip I TIMI score 5. The patient was given a dual loading antiplatelet, high-dose nitrate and statin, then we planned him for primary PCI. Primary PCI was performed on the right transradial through the single osteal coronary artery from the right sinus Valsalva. We got the TIMI flow 3 without other complications during the action.

Discussion: It is frequently difficult to identify the culprit lesion during primary PCI. The course of the anomalous vessel and the culprit lesion are clear often; the revascularization procedure hides several pitfalls.

Conclusion: Coronary artery anomalies presenting with STEMI are uncommon but often challenging. Percutaneous coronary intervention is considered the first choice in patients with coronary anomaly presented with STEMI.

Keywords: PCI, single coronary ostium, STEMI



Article History:

Received 24 February 2022

Accepted 28 February 2022

Published 28 February 2022

Published by:

Universitas Negeri Gorontalo

Address:

Jl. Jend. Sudirman No.6, Gorontalo
City, Gorontalo, Indonesia

Mobile number:

+62852 3321 5280

Email:

jmhsj@ung.ac.id

Introduction

Coronary artery anomalies presenting with ST-segment elevation myocardial infarction (STEMI) are uncommon and often are challenging to manage. The reported incidence of the right-sided origin of the left coronary artery (LCA) is only 0.02%-0.15%. An anomalous aortic origin of the left coronary artery (AAOLCA) coursing between the aorta and the pulmonary artery (PA) has a fatal risk of altered coronary flow due to the compression of the anomalous coronary artery between the great vessels during exercise.¹ We report a case of a successful percutaneous coronary intervention (PCI) of the right coronary artery (RCA) in a patient who presented with inferior STEMI and an anomaly of the left and right coronary arteries with a single coronary ostium in the right sinus of Valsalva. The presentation of this rare coronary anomaly with its imaging features and possible management options were also discussed.

Case

Male, 71 years old, was admitted to the emergency department with 8 hours onset of chest pain. An active smoker and hypertension on treatment. His blood pressure 150/90, heart rate was 78 bpm, peripheral saturation was 99% in room air. The ECG on this patient showed ST elevation in the inferior lead with st depression in V1-V5, as shown in Figure 1. We diagnosed this patient as STEMI Inferior 8 hours of onset Killip I TIMI score 5. The patient has been given a dual loading antiplatelet, high-dose nitrate and statin, then we planned him for primary PCI.

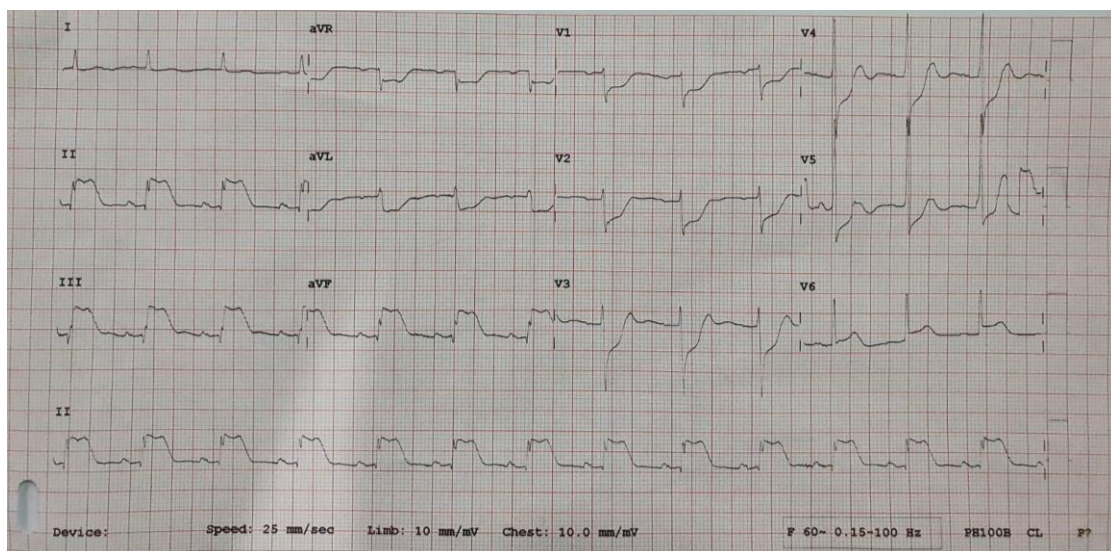


Figure 1. ECG findings on the patient

Primary PCI was performed on the right transradial. By the time we did the primary PCI, we had found it difficult to access the left main coronary artery. So we decided to access the right coronary artery. Surprisingly, there was an anomaly in the coronary arteries. We obtained a single ostial coronary artery arising from the right sinus Valsalva. On that ostial RCA, it branches off the left anterior descending artery. Total occlusion was found on distal RCA as presented in Figure 2A. Wiring is performed through the occlusion to distal RCA. Pre-dilation was performed with a 2.5 x 15 mm Saphine balloon in the mid to 16 atm. Then a 2.5 x 24 mm DES stent was implanted distally until the mid-PDA and expanded to 16 ATM. We got the TIMI flow 3 without other complications during the action, as shown in Figure 2B.

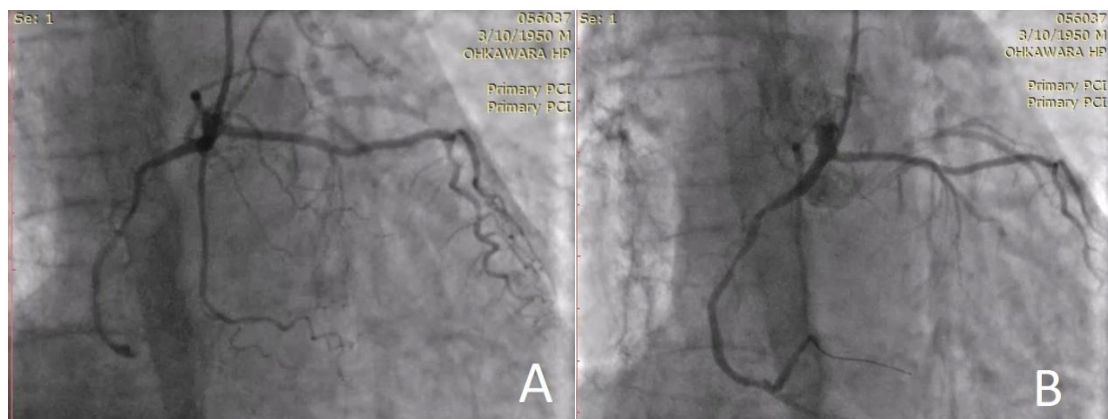


Figure 2. Coronary angiography of the patient. A. Initially, before the PCI procedure, shown a total occlusion on distal RCA. B. After PCI, the contrast appeared, filling the lower RCA blood vessels.

Discussion

The incidence of coronary anatomy anomalies is approximately 0,6% - 1,3%. There is various type of coronary artery anomaly, and the rarest condition is the anomalous aortic origin of the coronary artery from the opposite coronary sinus. The variant, in this case, a single ostium in the right sinus Valsalva is exceedingly rare, and only a few cases have been described in the literature.^{2,3}

In nearly 15% of patients with SCA, myocardial ischemia can develop in the absence of atherosclerosis. During exercise, a mismatch between myocardial demand (which is increased during exertion) and myocardial oxygen delivery, dependent upon the single coronary blood flow, may fail to increase demand or may even decrease during exertion. This limited or diminished coronary blood flow is probably the result of one or many high risk anatomic and physiologic factors: a). flap closure of the slit-like deformation of the coronary

ostium; b). the acute (non-orthogonal) angle of take-off and kinking of the coronary artery as it exits from the aorta; c.) hypoplasia and stenosis of the intramural segment, particularly at the level of the valvular commissure.^{4,5}

Currently, the ideal imaging tool for diagnosing and delineating coronary artery anomalies is angiography supported by CT angiography. The culprit lesions in an inter-arterial course may pose a great challenge in stented cases due to the compression of the vessel during strenuous exercise. It is important to know the course of the arteries before any intervention in PCI of anomalous coronary arteries. CTA is a useful diagnostic tool to delineate a probably malign variation to be stented or the anatomical relationship of the anomalous coronary trunk.⁶

During primary PCI, it is frequently difficult to identify the culprit lesion. The course of the anomalous vessel and the culprit lesion are clear often; the revascularization procedure hides several pitfalls. It is still a challenge for an interventional cardiologist in the settings of myocardial infarction in a patient with coronary anomaly where complete anatomy is unknown.

Conclusion

Coronary artery anomalies presenting with STEMI are uncommon but often are a challenge. Percutaneous coronary intervention is considered the first choice in patients with coronary anomaly presented with STEMI. The interventional cardiologist needs to know the full range of aberrant coronary anatomy, particularly in emergency cases where rapid identification of the culprit's vessel is crucial.

Conflict of Interest

We do not have any potential conflict of interest

Funding Sources

This case report funding by the authors

Acknowledgments

We want to thank all the Catheterization Laboratorium and Cardiovascular Care Unit members and team in Prof. Dr. H. Aloei Saboe General hospital.

References

1. Penalver JM, Mosca RS, Weitz D, Phoon CKL. Anomalous aortic origin of coronary arteries from the opposite sinus: a critical appraisal of risk. *BMC Cardiovasc Disord.* 12.
2. Koza Y, Tas H, Aydemir S. Percutaneous coronary intervention in a rare case of single coronary ostium presented with ST-elevation myocardial infarction. *Eurasian J Med.* 53(3): 307-309 (2019)
3. Villa ADM, Sammut E, Nair A, Rajani R, Bonamini R, et al. Coronary artery anomalies overview: The normal and the abnormal. *World J Radiol.* 8(6). 537-555 (2016)
4. Zami IMZ. Inferior myocardial infarction and total AV block in a patient with single ostium in the right sinus of Valsalva (A rare congenital coronary anomaly). *Cardiovascular Cardiometabolic Journal.* 3. 36-40 (2021)
5. Caravaglio J, Walesa C, Siddiqui I. A rare variant of a single coronary ostium arising from the right sinus of Valsalva. *Cathlab Digest.* 24(2).
6. Ola O, Anavekar N, Widmer RJ, Ammash NM, Sandoval Y. Single coronary artery anomaly in a woman with acute ST-segment elevation myocardial infarction. *J Am Coll Cardiol Case Rep.* 2(1). 69-71 (2020)