Cardiology and Angiology: An International Journal

8(4): 1-5, 2019; Article no.CA.52384
ISSN: 2347-520X, NLM ID: 101658392

Successful Primary PCI in a Patient with Acute Myocardial Infarction and Cardiogenic Shock with Super-dominant Right Coronary Artery and Absent Left Circumflex Artery

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Authors' contributions

This work was carried out in collaboration among all authors. Author GS designed the manuscript, provided the clinical findings, the laboratory findings, images for the study and wrote the first draft of the study. Authors MB, AJ and AG managed the literature searches. Author NOB revised the manuscript. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/CA/2019/v8i430114
Editor(s):
(1) Dr. Thiago Andrade de Macêdo, Hypertension Unit, Cardiology Division Heart Institute (InCor), Brazil.
Reviewers:
(1) Francesca Gorini, National Research Council, Italy.
(2) Endah Rahayuningsih, Padjadjaran University (Universitas Padjadjaran), Indonesia.
(3) Enrique Gallego-Colon, Medical University of Silesia, Poland.
Complete Peer review History: http://www.sdiarticle4.com/review-history/52384

Case Report

Received 28 July 2019
Accepted 31 October 2019
Published 20 November 2019

ABSTRACT

Super-dominant right coronary artery and the absent left circumflex artery is a rare congenital coronary anomaly, with only a few cases reported in the literature. Left anterior descending artery arises directly from the left anterior coronary cusp. Rare coronary anomalies are sometimes encountered during primary percutaneous interventions, which may lead to changes in the course of action. We report a case of a 38-year-old patient admitted with acute anterior wall myocardial infarction and cardiogenic shock. Coronary angiography revealed super-dominant right coronary artery and absent left circumflex artery. There was thrombotic occlusion of the proximal left anterior descending artery. The patient underwent successful primary percutaneous intervention of the left anterior descending artery with a good result, was discharged after 5 days. Our case also shows the importance of taking coronary angiogram of the contralateral artery first, before taking the shoot of the infarct-related artery.

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Keywords: Coronary anomalies; absent left circumflex artery; super-dominant right coronary artery.

ABBREVIATIONS

RCA : Right coronary artery;
LCX : Left circumflex artery;
LAD : Left anterior descending;
AV : Atrioventricular;
PCI : Percutaneous coronary intervention;
TIMI : Thrombolysis in myocardial infarction;
PLV : Posterior left ventricular branch;
LAO : Left anterior oblique.

1. INTRODUCTION

Congenital coronary artery anomalies are a rare group of diseases. Their prevalence reported in various studies range from 0.6% to 1.3% [1,2,3]. Most clinical manifestations are benign and asymptomatic [2]. Most of the coronary anomalies are incidentally detected during coronary angiograms. With the increase in the use of noninvasive methods to evaluate coronary arteries like coronary computed tomography (CT), their reporting is increased as compared to the studies done in the past with invasive angiograms. Absent LCX with super-dominant RCA is an extremely rare congenital coronary anomaly, with only a few cases reported in the literature. The prevalence is 0.003% in one study [2]. In this anomaly, LCX artery is not seen to develop in the left AV groove and the RCA continues across the crux into the left AV groove, as a large posterior left ventricular branch and supplies the area supplied by the normal LCX [4]. We report a case of a 38-year-old patient admitted with acute anterior wall myocardial infarction and cardiogenic shock. Coronary angiography revealed super-dominant RCA and absent LCX artery. There was thrombotic occlusion of proximal LAD. The patient underwent successful primary PCI of LAD with a good result, was discharged after 5 days.

2. CASE PRESENTATION

38 Year old male, smoker, admitted with acute onset of chest pain since 3 hours and breathlessness at rest for 1 hour. On examination, pulse was 108/min, blood pressure was 100/60 mmHg on inotropes. Bilateral basal crepitations were present on respiratory system examination, arterial blood gas showed hypoxia. Routine blood investigations were normal. Electrocardiogram showed acute anterior wall myocardial infarction. Echocardiography showed hypokinetic basal, mid and distal anteroseptal, anterior and anterolateral segments with an ejection fraction of 25%. Options were explained to the relatives. Taken for coronary angiography/ primary PCI. Right, femoral vein/artery and left femoral artery access obtained with intra-aortic balloon pump standby (non-availability of Impella device). Right coronary angiogram showed super-dominant RCA with large posterior left ventricular branch reaching up to the left lateral surface of the heart (Fig. 1A, 1B). Left coronary angiogram showed thrombotic occlusion of the left coronary artery in the proximal segment (Fig. 2). No other artery was arising from the left anterior coronary cusp on the cuspal shoot. The lesion in left coronary artery was crossed with routine PCI wire followed by thrombosuction. The lesion was stented with 3x40 mm drug-eluting stent. Check shoot showed a good result with TIMI III flow (Fig. 3). Multiple diagonal arteries were arising from LAD, but there was no artery arising at the place of LCX. As the patient was in cardiogenic shock, multiple shoots were not taken. The patient was shifted to the intensive care unit for monitoring. Vitals stabilized, inotropes were tapered over the next 2 days. The patient was discharged after 5 days. Ejection fraction improved to 50% at 6 weeks. The patient is asymptomatic on subsequent follow-ups.

3. DISCUSSION

The congenital absence of the LCX is an extremely rare congenital coronary anomaly. It results from the failure of the development of LCX in the left atrioventricular groove. However, some authors believe that this condition is not a true congenital anomaly of the absent artery, it is defined as the anomalous origin of the LCX from distal RCA [5,6]. It is an incidental benign finding on coronary angiography done for other reasons, as in our patient. The patient usually presents with exertional chest pain or acute coronary syndrome due to a significant lesion in RCA [7]. In one case, Mievis et al. reported myocardial infarction in a 31-year-old male patient with no significant coronary artery disease and absent LCX [8]. Some patients present with exertional chest pain even in the absence of significant stenosis in the RCA [9]. This type of exertional symptoms is due to the steal phenomenon, which results from increased metabolic demands in the LCX territory that increases arterial supply to the LCX territory and results in transient ischemia of other coronary arterial territories [10,11].

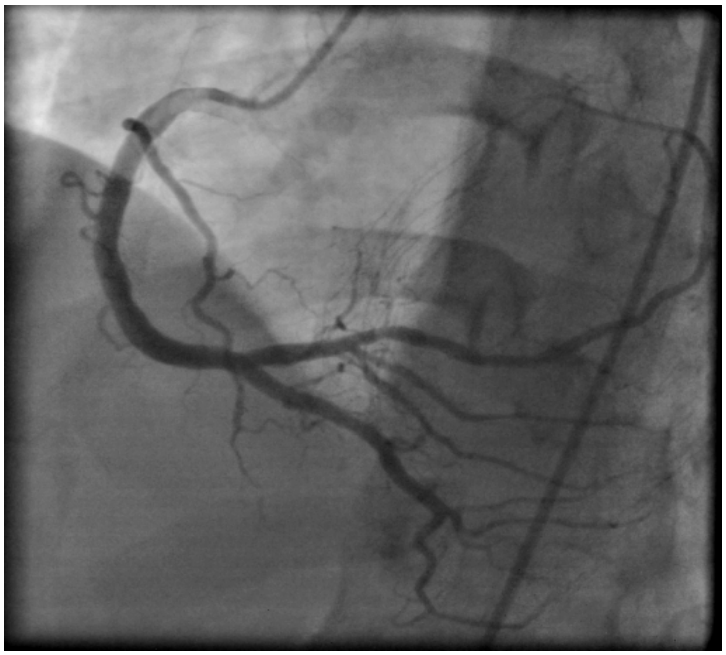

Fig. 1A. Right coronary angiogram in LAO cranial view showing normal large PLV branch In the left AV groove

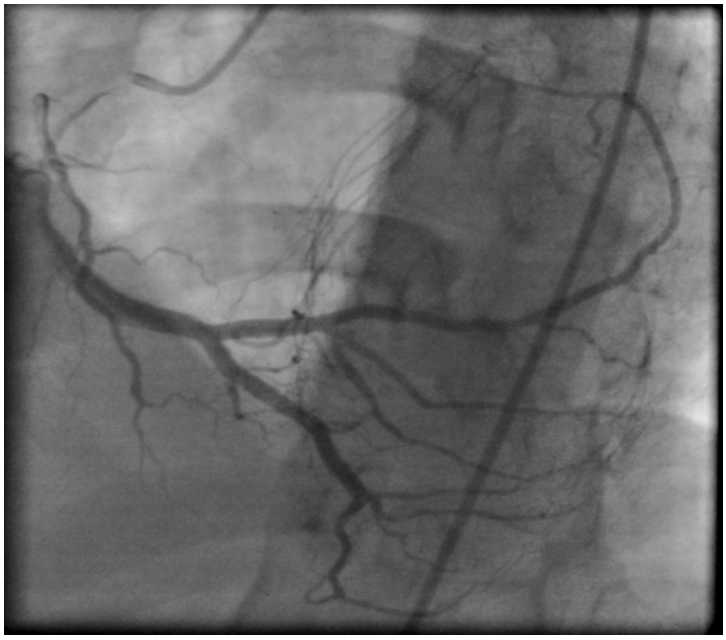

Fig. 1B. Continued right coronary angiogram showing large PLV branch in the left AV groove continuing beyond the left heart border

No specific treatment is required in a patient with incidentally detected, either on invasive angiogram or CT angiography, absent LCX with normal other coronaries. It is very important to differentiate a 100% occluded LCX from absent LCX. It is also very important to identify this anomaly in patients undergoing coronary bypass surgery to ensure complete reperfusion of the myocardium and to avoid iatrogenic injury. Kadiyala M et al. has reported a similar case, but in that patient, there was significant stenosis in LAD. In our patient LAD was occluded in the proximal segment with thrombus [12].

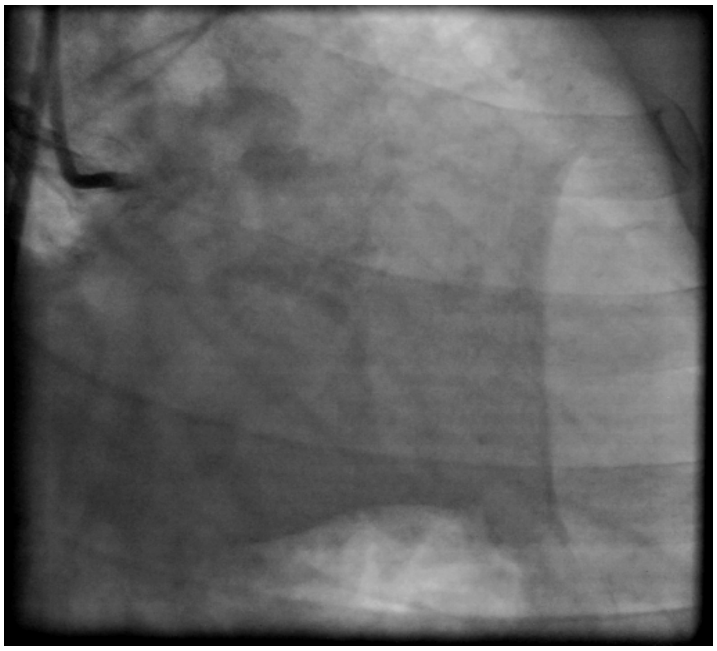

Fig. 2. Left coronary angiogram showing thrombotic occlusion in the proximal segment

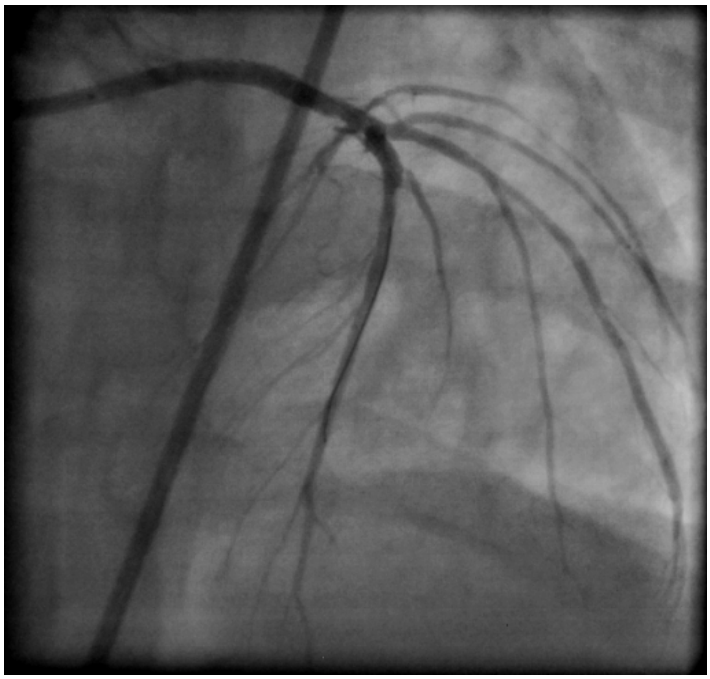

Fig. 3. Left coronary angiogram after stenting showing good result

4. CONCLUSION

The congenital absence of LCX is a very rare congenital coronary anomaly. It is a benign condition unless it is superimposed by atherosclerotic coronary artery disease. Absent LCX should be considered in the differential diagnosis in selected cases, to ensure satisfactory decision making in a patient. It should be differentiated from ostial total

occlusion of LCX. To ensure complete revascularization, it is very important to identify this anomaly.

CONSENT

Written informed consent was obtained from the patient for publication of this report and any accompanying images.

ETHICAL APPROVAL

As per international standard, ethical approval has been collected and preserved by the author.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Roberts WC. Major anomalies of coronary arterial origin seen in adulthood. Am Heart J. 1986;111:941-63.
2. Yamanaka O, Hobbs RE. Coronary artery anomalies in 126,595 patients undergoing coronary arteriography. Cathet Cardiovasc Diagn. 1990;21(1):28-40.
3. Angelini P, Villason S, Chan AV, Diez JG. Normal and anomalous coronary arteries in humans. In: Angelini P, editor. Coronary Artery Anomalies: A Comprehensive Approach. Philadelphia: Lippincott. Williams & Wilkins; 1999. p. 27-150.
4. Hongsakul K, Suwannanon R. Congenital absence of left circumflex artery detected by computed tomography coronary angiography: a case report. Case Rep Vasc Med. 2012;204657.
5. Erol C, Seker M. Coronary artery anomalies: the prevalence of origination, course, and termination anomalies of coronary arteries detected by 64-detector computed tomography coronary angiography. Journal of Computer Assisted Tomography. 2011;35(5): 618–624.
6. Shriki JE, Shinbane JS, Rashid MA et al. identifying, characterizing, and classifying congenital anomalies of the coronary arteries. Radiographics. 2012;32(2): 453–468.
7. Varela D, Teleb M, Said S, Fan J, Mukherjee D, Abbas A. Congenital absence of left circumflex presenting after an emotional stressor. Polish Journal of Radiology. 2015;80(1):529–531.
8. Mievis E, Bopp P, Righetti A. Congenital absence of the circumflex artery. Association with an infarction without coronary artery disease. Arch Mal Coeur Vaiss. 1979;72:1155-9.
9. Shaikh S, Deshmukh V, Patil V, Khan Z, Singla R, Bansal NO. Congenital Absence of the Left Circumflex Artery with Super-Dominant Right Coronary Artery: Extremely Rare Coronary Anomaly. Cardiol Res. 2018;9(4):264-267
10. Gentzler II R D, Gault JH, Liedtke AJ, McCann WD, Mann RH, Hunter AS. Congenital absence of the left circumflex coronary artery in the systolic click syndrome. Circulation. 1975;52(3):490–496.
11. Majid Y, Warade M, Sinha J, Kalyanpur A, Gupta T. Super-dominant right coronary artery with absent left circumflex artery. Biomedical Imaging and Intervention Journal. 2011;7(1):e2, 1–3.
12. Kadiyala M, Majella CM, Vijaysekaran S, Kumar SS, Chidambaram S. Congenital absence of left circumflex coronary artery and stenting of the stenosed proximal left anterior descending artery in a young male. Heart India. 2018; 6:22-4.

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sdiarticle4.com/review-history/52384