Anomalous Intercoronary Communication with Unidirectional Flow in the Absence of Obstructive Coronary Artery Disease: A Case Report

Arash Gholoobi, MD\textsuperscript{1*}, Mohammad Vojdanparast, MD\textsuperscript{2}

\textsuperscript{1}Atherosclerosis Prevention Research Center, Imam Reza Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.
\textsuperscript{2}Cardiovascular Research Center, Mashhad University of Medical Sciences, Mashhad, Iran.

Received 29 June 2015; Accepted 30 October 2015

Abstract

Large intercoronary communications in the absence of obstructive coronary artery disease constitute a very rare coronary artery anomaly in which there is a readily visible connection between the 2 coronary arteries with a unidirectional or bidirectional blood flow; consequently, this anomaly may be misinterpreted as a functioning collateral vessel, indicative of an unrecognized proximal coronary artery occlusion. In contrast to collateral vessels that are seen in the presence of critical coronary artery stenosis and total occlusions, these arterial communications are vessels that are single, extramural, straight, and large in diameter. Myocardial ischemia could result from the coronary steal phenomenon by a unidirectional intercoronary communication. Herein, we describe a 57-year-old female with chest pain who was found in coronary angiography to have a single large intercoronary channel between the posterolateral branch of the right coronary artery and the distal left circumflex artery with a unidirectional flow.

J Teh Univ Heart Ctr 2016;11(4):203-205

This paper should be cited as: Gholoobi A, Vojdanparast M. Anomalous Intercoronary Communication with Unidirectional Flow in the Absence of Obstructive Coronary Artery Disease: A Case Report. J Teh Univ Heart Ctr 2016;11(4):203-205.

Keywords: Coronary angiography • Coronary vessel anomalies • Congenital abnormalities

Introduction

In the normal coronary circulation, although there are some intercoronary and intracoronary anastomotic channels, they are functionally insignificant and are too small to be visualized by conventional coronary angiography. However, the development of a severe coronary stenosis or total occlusion increases the flow through these channels and hence their size, making them readily visible on coronary angiography. Large intercoronary communications in the absence of obstructive coronary artery disease constitute a very rare coronary artery anomaly.\textsuperscript{1, 2} Herein, we describe a patient with this type of anomaly found incidentally on coronary angiography.

Case Report

A 57-year-old female with chest pain and palpitation as chief symptoms was referred to us for coronary angiography. She had been discharged from another hospital with a diagnosis of probable acute coronary syndrome. She only
had a history of hypertension. Laboratory findings were unremarkable with normal fasting plasma glucose and lipid profile and negative cardiac enzymes. Electrocardiogram (ECG) was normal except for frequent premature atrial contractions. Echocardiography also revealed normal left ventricular systolic function with mild hypertrophy and no regional wall motion abnormality. There was grade 1 diastolic dysfunction.

Coronary angiography showed a normal left coronary system (Figure 1 and Figure 2.). During right coronary artery (RCA) injection, a single abnormal vessel was seen connecting the posterolateral branch to the distal left circumflex (LCx) artery and opacifying the distal LCx as well as the obtuse marginal branch in a retrograde fashion (Figure 3 and Figure 4.).

Figure 1. Coronary angiography in the right anterior oblique projection with caudal angulation shows a normal left coronary system.
LAD, Left anterior descending artery; LCx, Left circumflex artery; LMCA, Left main coronary artery

Figure 2. Coronary angiography in the right anterior oblique projection with cranial angulation shows a normal left coronary system.
LAD, Left anterior descending artery; LMCA, Left main coronary artery

Figure 3. Coronary angiography in the straight left anterior oblique projection reveals a normal right coronary artery. There is a single large channel (black arrow) connecting the posterolateral branch to the distal left circumflex artery.
LCx, Left circumflex artery; RCA, Right coronary artery; PDB, Posterior descending branch; PLB, Posterolateral branch

Figure 4. Coronary angiography in the straight right anterior oblique projection reveals a normal right coronary artery. There is a single large channel (black arrow) connecting the posterolateral branch to the distal left circumflex artery, which opacifies the obtuse marginal branch (white arrow) as well.
LCX, Left circumflex artery; OMB, Obtuse marginal branch; RCA, Right coronary artery

Discussion

Anomalous intercoronary communications constitute a very rare coronary artery anomaly. In contrast to collateral vessels that are seen in the presence of critical coronary artery stenosis and total occlusions, these arterial communications are vessels that are single, extramural, straight, and large
Anomalous Intercoronary Communication with Unidirectional Flow in the Absence of Obstructive Coronary Artery Disease: A Rare Anomaly and Its Clinical Implications

Khalid H. Alasna, MD, PhD

The Journal of Tehran University Heart Center

October 03, 2016

J Teh Univ Heart Ctr 11 (4)

Anomalous intercoronary communications comprise a very rare coronary artery anomaly where there is a single, straight, and large arterial communication between the distal branches of RCA (PD or PL branches) and the distal LAD or LCx with unidirectional or bidirectional blood flows. One should be aware of this type of coronary anomaly so as not to misinterpret it as a functioning collateral vessel indicative of an unrecognized proximal coronary artery occlusion.

Conclusion

Anomalous intercoronary communications comprise a very rare coronary artery anomaly where there is a single, straight, and large arterial communication between the distal branches of RCA (PD or PL branches) and the distal LAD or LCx with unidirectional or bidirectional blood flows. One should be aware of this type of coronary anomaly so as not to misinterpret it as a functioning collateral vessel indicative of an unrecognized proximal coronary artery occlusion.

References

1. Yamanaka O, Hobbs RE. Coronary artery anomalies in 126,595 patients undergoing coronary arteriography. Cathet Cardiovasc Diagn 1990;21:28-40.
2. Esente P, Gensini GG, Giambartolomei A, Bernstein D. Bidirectional blood flow in angiographically normal coronary arteries. Am J Cardiol 1983;51:1237-1238.
3. Kim SH, Kim DH, Choi WG, Woo SI, Choi IS, Kwan J, Park KS, Shin SH. Intercoronary communication between the circumflex and right coronary arteries coexisted with coronary vasospasm. Korean Circ J 2013;43:488-490.
4. Sokmen A, Tuncer C, Sokmen G, Akcay A, Koroglu S. Intercoronary communication between the circumflex and right coronary arteries: a very rare coronary anomaly. Hellenic J Cardiol 2009;50:66-67.
5. Voci G, Patel RB, Trivedi AD, Patel PV, Burris AC, Ruby SR. Angiographic demonstration of congenital intercoronary communication in normal adults. Am J Cardiol 1987;59:1205-1206.
6. Sengül C, Ozveren O, Oduncu V, Degertekin M. Unidirectional intercoronary communication: a very rare coronary anomaly and cause of ischemia. Turk Kardiyol Dern Ars 2011;39:344.
7. Linsenmeyer GJ, 3rd, Schneider JF. Angiographically visible intercoronary collateral circulation in the absence of obstructive coronary artery disease. Am J Cardiol 1984;53:954-956.
8. Nerantzis CE, Marianou SK, Koulouris SN, Agapitos EB, Papaioannou JA, Vlahos LJ. Kugel’s artery: an anatomical and angiographic study using a new technique. Tex Heart Inst J 2004;31:267-670.