Ectopic Origin of Coronary Arteries Diagnosed by Coronary Angiography

Xhevdet Krasniqi, Daut Gorani, Basri Sejdiu, Hajdin Citaku
Clinic for Cardiology, University Clinical Center of Kosova, Prishtina, Republic of Kosova

Corresponding author: Xhevdet Krasniqi, MD. University Clinical Center. Prishtina, Republic of Kosova. E-mail: xhevdet16@hotmail.com

doi: 10.5455/aim.2016.24.218-219
ACTA INFORM MED. 2016 JUN; 24(3): 218-219
Received: MAR 13, 2016 • Accepted: APR 25, 2016

© 2016 Xhevdet Krasniqi, Daut Gorani, Basri Sejdiu, Hajdin Citaku
This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (http://creativecommons.org/licenses/by-nc/4.0/) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

1. INTRODUCTION

The coronary artery anomalies are classified into abnormalities of origin, distribution and termination. Congenital anomalies of coronary arteries have an incidence about 1% in patients undergoing coronary angiography while the incidence of anomalous origination of the left coronary artery from right sinus is 0.15% and the right coronary artery from the left sinus is 0.92%. The left circumflex artery (ALCx) may arises from a separate ostium within the right sinus, or very unusually as a proximal branch of the right coronary artery (RCA) with the approximate incidence of 0.37 to 0.7% in all patients (9, 10). In adult patients, the prognosis of coronary artery anomalies considering the vulnerability to atherosclerosis is determined on relationship of the arterial course to aorta and pulmonary arteries and may be associated with congestive heart failure, arrhythmia, myocardial infarction, syncope and sudden death (11-14). In this paper, we present two cases of anomalous origin of coronary arteries arising from the opposite sinuses.

2. CASE REPORT

First case is a 62-year-old female patient hospitalized in our clinic due to chest pain with a history of arterial hypertension and diabetes mellitus. Cardiac biomarkers showed: serum creatinine kinase level of 82 IU/L, creatinine kinase-myocardial band level of 33.6U/L, and troponin-T level of 684ug/L. Electrocardiography characterized with ST segment depression in V1-V3. Transthoracic echocardiography (TTE) presented regional wall motion abnormality in the entire severely hypokinetic inferior wall.
Ectopic Origin of Coronary Arteries Diagnosed by Coronary Angiography

The invasive coronary angiography revealed the left coronary artery arising from the right coronary sinus sharing a same ostium with right coronary artery (Figure 1). The proximally and distally stenosed left anterior descending artery (LAD) (Figure 2) correlates with calcified atherosclerotic medial and distal right coronary artery (RCA) stenosis. The second case is a 47-year-old male who presented to emergency department with chest pain. He also had arterial hypertension and positive familial history for ischemic heart disease. Cardiac biomarkers: serum creatinine kinase, creatine kinase-myoocardial band and troponin-T presented with normal values. Electrocardiography showed atypical ST segment changes in leads V4-V6. Transthoracic echocardiography (TTE) did not present regional wall motion abnormalities.

A coronary angiogram showed an anomalous right coronary artery arising from the left Valsalva sinus from a separate ostium with the left coronary artery (Figure 3, 4). Medial and distal segments of LAD were tortuous.

3. DISCUSSION

Ectopic origin of coronary arteries from the opposite sinus is clinically determined depending their course and the presence of atherosclerotic changes. Left coronary artery arises from the right sinus may pass anteriorly over the right ventricular outflow tract, posterior to the aorta, between the aorta and pulmonary artery and intramurally. Right coronary artery arises from the left sinus may pass between the aorta and pulmonary artery and posterior to the aorta. In this way, interarterial course is possible characteristic of both ectopic origin of anomalous coronary arteries that in case of left coronary artery correlates with the higher incidence of angina, syncope and sudden death while in case of right coronary artery is less dangerous (8, 15). The interarterial subtype clinically is determined mainly with proximal portion of anomalous vessel that may course through the wall of the aorta resulting in narrowing of the lumen, functional ostial stenosis-proximal portion often exits the aorta with an acute angle and can also course between the aorta and pulmonary artery compressed by pressure and volume expansion of the pulmonary artery against the aorta (16-18). Anatomic variants that present with posterior, anterior and septal course are asymptomatic because myocardial perfusion is not provoked on physical effort (20). The atherosclerotic coronary artery disease leads to the need of coronarography find out the presence of ectopic origin from opposite sinus of coronary artery anomalies that considering the vulnerability to atherosclerosis will be challenging during treatment especially when presented with STEMI as a complex occurrence (14, 21, 22).

4. CONCLUSION

The coronary angiography of patients with coronary ischemia determined atherto-sclerotic disease with possibility of the presence of coronary artery anomalies, but also coronary angiography may reveal coronary artery anomaly without the presence of atherosclerotic changes. The ectopic origin from opposite sinus of coronary artery anomalies that presents with atherosclerotic changes continues to exist as a challenge during treatment in interventional cardiology.

• Conflict of interest: none declared

REFERENCES

1. Zhang LJ, Yang GF, Huang W, et al. Incidence of anomalous origin of coronary artery in 1879 Chinese adults on dual-source CT angiography. Neth Heart J. 2010; 18: 466-70.
2. Yamakawa O, Hobbis RE. Coronary artery anomalies in 126,559 patients undergoing coronary arteriography. Cathet Cardiovasc Diagn. 1990; 21: 28-40.
3. Safak O, Gursul E, Yesil M, Tuluce SY, Arikran ME, Ozsildirim S, Akcay FA, Yagiz IK, Börglen R. Prevalence of coronary artery anomalies in patients undergoing coronary artery angiography: a review of 16768 patients. A retrospective, single-center study. Minerva Cardioangiol. 2015 Apr; 63(2): 113-20.
4. Vinceti J, Todorovic N, Maruni P. Pustic S. Anomalous origin of the left coronary artery from the right sinus of Valsalva in a 62-year-old woman with unstable angina pectoris: a case report. Int J Cardiovasc. 2009; 142: e53-7.
5. Lantisio G, Tsiofko K, Tousoudis D, Kalikazaros I, Stefanadis C. Common origin of both right and left coronary artery from the right sinus of Valsalva. Int J Cardiol. 2008; 128: e60-1.
6. Kamman HC, Satoo G, Gandelman G, Delacao AJ, Belkin R, Momose C et al. Anomalous origin of the left main coronary artery from the right sinus of Valsalva with an intramural course identified by transesophageal echocardiography in a 14 year old with acute myocardial infarction. Cardiol Rev. 2005; 13: 219-22.
7. Hauser M. Congenital anomalies of the coronary arteries. Heart. 2005; 91(9): 1240-45.
8. Ragielll G, Dill Avocotta, Van Tan N, Daggubati R, Nanijumpaka A. Congenital coronary artery anomalies silent until geriatric age: non-invasive assessment, angiography tips, and treatment. Journal of Geriatric Cardiology. 2015; 12: 66-75.
9. Angelini P. Coronary artery anomalies: an entity in search of an identity. Circulation. 2007; 115: 1296-3.
10. Ruzenman Y. Anomalous origin of the circumscribed coronary artery from the right sinus of Valsalva as a cause of ischemia at old age. Clin Cardiol. 1993; 16: 900-1.
11. Yucel S, Meric M, Soyka K, et al. The primary anomalies of coronary artery origin and course: A coronary angiographic analysis of 16,573 patients. Exp. Clin Cardiol. 2013; 18(2): 121-3.
12. Zhang LJ, Yang GF, Huang W, Zhou CS, Chen P, Lu GM. Incidence of anomalous origin of coronary artery in 1879 Chinese adults on dual-source CT angiography. Neth Heart J. 2010; 18: 466-70.
13. Andrensi D, Mischra T, Pontone G, et al. Additional clinical role of 64-slice multidetector computed tomography in the evaluation of coronary artery variants and anomalies. Int J Cardiovasc. 2010; 145: 388-90.
14. Liu H, Zhu C, Guo Y, Zhang M, Li J. A rare case of complex anomalous origin of coronary arteries with severe atherosclerosis. Chin Med J (Engl). 2014; 127(24): 4297-8.
15. Adam T. Marler, Jamil A. Malik, and Ahmad M. Slim. Anomalous Left Main Coronary Artery: Case Series of Different Courses and Literature Review. Case Rep Vasc Med. 2013; 2013: 380952.
16. Bartoli CR, Wedd WB, Girirakan GA, Prabhoo SD, Koeng SC, Dowling RD. Mechanism of myocardial ischemia with an anomalous left coronary artery from the right sinus of Valsalva. J Thorac Cardiovasc Surg. 2012; 144: 402-8.
17. Lee BY. Anomalous right coronary artery from the left coronary sinus with an interarterial course: is it really dangerous? Korean Circ. 2009; 39: 175-9.
18. Angelini P. Novel Imaging of Coronary Artery Anomalies to Assess Their Prevalence, the Causes of Clinical Symptoms, and the Risk of Sudden Cardiac Death. Cirs Cardiovasc Imaging. 2014; 7: 747-54.
19. Tejada JG, Hernandez F, Sanchez I, et al. Stenting of anomalous left main coronary artery arising from the right sinus of Valsalva: a case report. Int J Cardiovasc. 2007; 119: 266-7.
20. Dogan SM, Gursurer M, Aydini M, et al. Myocardial ischemia caused by a coronary anomaly: left anterior descending coronary artery arising from right sinus of Valsalva. Int J Cardiovasc. 2006; 112: e57-9.
21. Citak H, Kamberi L, Goci D, Krijaj D, Kramarić X. Anomalous Origin of Left Circumflex Artery. Med Arch. 2015 Dec; 69(6): 423-4.
22. Marchesini J, Campo G, Righi R, Benua G, Ferrari R. Coronary artery anomalies presenting with ST-segment elevation myocardial infarction. Clin Pract. 2011; 1(4): e107.