Anomalous Origin of a Stenosed Left Circumflex Coronary Artery in a Patient Presenting with Unstable Angina: A Case Report

HOSSEIN VAKILI¹, ISA KHAHESHI¹, MEHDI MEMARYAN¹, MOHAMMADREZA NADERIAN²

¹Cardiovascular Research Center, Modarres Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran

²Non-Communicable Diseases Research Center, Endocrinology and Metabolism Population Sciences Institute, Tehran University of Medical Sciences, Tehran, Iran

Students' Scientific Research Center (SSRC), Tehran University of Medical Sciences, Tehran, Iran

A 73 year-old man presented to our emergency department with complaint of retrosternal chest pain since 2 day and admitted with diagnosis of unstable angina. He underwent diagnostic coronary angiography in which left circumflex artery (LCX) was not visualized during injection of the left coronary artery; indeed, it was originated, with common origin with RCA, from right coronary sinus of Valsalva. This case report is one of the uncommon cases with aberrant coronary arteries who presented with unstable angina. Moreover, coronary angiography with following coronary angioplasty was performed for him in a challenging course and angle for coronary intervention.

Key words: Angina, Unstable; Coronary Vessel Anomalies; Coronary Angiography.

INTRODUCTION

Coronary artery anomalies are rarely identified among all patients who are candidates for coronary angiography; the anomalous origin of left circumflex coronary artery (LCX) is one of the most familiar anatomic variations. Patients with anomalous coronary artery presenting with unstable angina represent a small population. In spite of some challenges and difficulties, PCI with stenting is an acceptable option in these circumstances for significant coronary artery lesions.

CASE REPORT

A 73 year-old man presented to our emergency department with complaint of retrosternal chest pain lasting for 2 day. He was diagnosed with hypertension 20 years ago and with diabetes mellitus 18 years ago. His drug history includes: Metformin 500 mg BID, Losartan 50 mg daily, Aspirin 81 mg daily, Atorvastatin 20 mg daily and Hydrochlorothiazide 25 mg daily; on admission, blood pressure, pulse rate, respiratory rate and body temperature were as follows: 125/75 mmHg, 82 beats per minute, 18 per minute and 37.0°C, respectively.

Physical examination had no remarkable finding. The EKG showed sinus rhythm with 0.5 mm

ST-segment depression in leads I, AVL, V₅ and V₆; cardiac enzymes including CK-MB and cardiac troponin I were within the normal range; serial electrocardiograms revealed no dynamic ST-T changes. A transthoracic echocardiography demonstrated LV systolic ejection fraction of 50% with mild hypokinesia of inferolateral wall. Diagnostic coronary angiography was performed which showed mild (about 30%) stenosis at mid segment of left anterior descending artery. However, the left circumflex artery (LCX) was not visualized during injection of the left coronary artery. There was a mild (about 30%) stenosis at distal segment of right coronary artery; in addition, LCX was originated, with common origin with RCA, from right coronary sinus of Valsalva and had a retro-aortic course.

Due to very significant stenosis (99%) at mid portion of aberrant LCX, angioplasty was done by deployment of 2.5 * 24 mm drug eluting stent (DES) at 8 atmospheric pressure. End result TIMI III flow was attained.

The patient was discharged the next day in a good general condition with Aspirin 81mg daily and Clopidogrel 75mg daily for at least one year.

The patient was followed-up at 3 and 6 months. He was in good condition with no complaint of chest discomfort. He had no limitation in his daily activities and had regular moderate intensity exercise of 40 minutes, 4 times a week.

Figure 1. A, B: Left coronary angiography showed mild stenosis of left anterior descending artery. However, the left circumflex artery (LCX) was not visualized during injection of the left coronary artery; C: There was mild stenosis at distal portion of right coronary artery; in addition, aberrant LCX was originated, with common origin with RCA, from right coronary sinus of Valsalva and had very significant stenosis (99%) at mid portion (black arrow); D: After angioplasty with DES, TIMI III flow was achieved.

DISCUSSION

Among all patients who are candidates for coronary angiography, coronary artery anomalies can be identified in 0.6% to 1.5% of them. The anomalous origin of left circumflex coronary artery (LCX) is one of the most frequent anatomic variations [1, 2]. The clinical importance of the anomaly is clear in patients undergoing coronary revascularization.

Aberrant LCX, arising from the right coronary sinus, does not predispose the LCX to a higher frequency of obstructive disease. However, in the presence of significant lesion of LCX, it is essential to recognize the anomaly angiographically and manage it properly [3].

Our patient was candidate for angioplasty of LCX. Percutaneous coronary intervention (PCI) of

aberrant coronary arteries is challenging technically due to insufficient visualization during coronary angiography, inability to achieve a coaxial engagement of catheter during PCI, necessity of significant curve in the guide wire and trouble with the advancement of the balloon or the stent delivery system. Moreover, selecting suitable guiding catheter is crucial in the performance of angioplasty in the anomalous coronary artery [4-6].

In conclusion, patients with anomalous coronary artery presenting with unstable angina include a small population; in spite of some challenges and difficulties, PCI with stenting is a reasonable option in these circumstances for significant coronary artery lesions; sufficient anatomical and technical knowledge is required for a successful PCI of anomalous coronary arteries.

Un pacient în vârstă de 73 de ani s-a prezentat la departamentul de urgență al spitalului nostru cu durere retrosternală de 2 zile fiind internat cu diagnosticul

de angină instabilă. S-a realizat o coronarografie în care s-a observat că artera circumflexă stângă (LCX) nu s-a putut vizualiza în momentul injectării cu substanță de contrast a arterei coronare stângi. Într-adevăr a avut originea comună cu artera circumflexă dreaptă din sinusul Valsalva coronarian drept. Prezentarea de caz prezintă un caz atipic de origine aberantă a arterei coronare prezentându-se cu angină instabilă. Mai mult, angioplastia a fost dificilă datorată traiectului coronarian dificil.

Corresponding author: Isa Khaheshi, MD, Cardiovascular Research Center,
Modarres Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran
E-mail: isa_khaheshi@yahoo.com

REFERENCES

1. WILKINS CE, BETANCOURT B, MATHUR VS, MASSUMI A, DE CASTRO CM, GARCIA E, *et al.* Coronary artery anomalies: a review of more than 10,000 patients from the Clayton Cardiovascular Laboratories. *Tex Heart Inst J.* 1988; **15**(3):166-73.
2. YAMANAKA O, HOBBS RE. Coronary artery anomalies in 126,595 patients undergoing coronary arteriography. *Cathet Cardiovasc Diagn.* 1990; **21**(1):28-40.
3. PAGE HL, JR, ENGEL HJ, CAMPBELL WB, THOMAS CS, JR. Anomalous origin of the left circumflex coronary artery. Recognition, angiographic demonstration and clinical significance. *Circulation.* 1974; **50**(4):768-73.
4. SARKAR K, SHARMA SK, KINI AS. Catheter selection for coronary angiography and intervention in anomalous right coronary arteries. *J Interv Cardiol.* 2009; **22**(3):234-9.
5. SCHRALE RG, CHANNON KM, ORMEROD OJ. Anomalous circumflex artery: intravascular ultrasound imaging of dynamic compression and "two wire-two vessel" percutaneous intervention. *Int J Cardiol.* 2007; **115**(1):e41-3.
6. TALANAS G, DELPINI A, BILOTTA F, SABINO G, UNEDDU F, FIORE G, *et al.* Primary angioplasty of an anomalous right coronary artery arising from the left sinus of Valsalva. *J Cardiovasc Med (Hagerstown).* 2012; **13**(1):60-4.

Received May 13, 2016