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Case Report

ACUTE MYOCARDIAL INFARCTION IN A 58-YEAR-OLD FEMALE WITH ANOMALOUS ORIGIN OF THE LEFT CORONARY ARTERY FROM THE RIGHT SINUS OF VALSALVA

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SUMMARY – We report a case of a 58-year-old female with a history of hypertension, hypercholesterolemia and diabetes type 2, who was admitted to the coronary care unit with continuous substernal severe chest pain persisting for two hours. Her electrocardiogram showed ST-elevation acute myocardial infarction. ST-segment elevation was noted in leads I and aVL and ST-segment depression in leads II, III and V3-V5. The troponin-I level was elevated (1.97 ng/L). Coronary angiography showed anomalous origin of the left coronary artery from the right sinus of Valsalva and subocclusion in the proximal portion of the diagonal branch. In conclusion, primary percutaneous coronary intervention (PCI) of diagonal branch was performed with balloon dilatation and thrombolysis in myocardial infarction TIMI 3 flow was achieved. After PCI, she had no chest pain. At 5-year clinical follow-up, the patient was asymptomatic.

Key words: *Coronary artery anomaly; Myocardial infarction; Percutaneous coronary intervention*

Introduction

Anomalous origin of the left coronary artery (LCA) from the right sinus of Valsalva is a rare congenital anomaly. The incidence of the anomalies of coronary arteries in general population is unknown and is reported to be between 0.6% and 1.3% in angiographic series and 0.3% in autopsy series[1]. Coronary artery anomalies correlate with sudden death after exercise, syncope, arrhythmias, angina pectoris, and acute myocardial infarction. We present a case of a 58-year-old woman with ST-elevation acute myocardial infarction related to anomalous LCA origin from the right sinus of Valsalva and subocclusion of diagonal branch (DIAG). Successful primary percutaneous coronary intervention (PCI) with balloon dilatation of the diagonal branch was performed with thrombolysis in myocardial infarction TIMI 3 postprocedural flow. After intervention, she had no more chest pain.

Case Report

A 58-year-old female with a medical history of hypertension, hypercholesterolemia and diabetes type 2 was admitted to the coronary care unit because of acute myocardial infarction. Her symptoms began 2 hours before admission. Her medical therapy included AT-II blocker, calcium channel blocker, statin, metformin and

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glibenclamide. On admission, she was hypertensive with blood pressure 160/90 mm Hg and regular pulse of 95 bpm. Cardiac auscultation was unremarkable and the lungs were clear. The electrocardiogram showed sinus rhythm 95 bpm with 3 mm ST-segment elevation in leads I and aVL, and 2 mm ST-segment depression in II, III, V3-V5 (Fig. 1A). Her routine admission laboratory studies revealed elevated level of troponin-I 1.97 ng/L, total cholesterol 6.84 mmol/L, triglycerides 1.94 mmol/L, HDL cholesterol 1.68 mmol/L, LDL cholesterol 4.28 mmol/L, glucose 15.3 mmol/L, creatinine 85 mmol/L and C-reactive protein 27.7 mg/L. Coronary angiography was performed from the standard right femoral approach. Since selective cannulation of LCA was unsuccessful, aortography was performed, which revealed the presence of an anomalous origin of the LCA from the right sinus of Valsalva (Fig. 1B). Selective cannulation of the right coronary ostium revealed that both right coronary artery (RCA) and LCA originated from the same ostium. There was nonsignificant stenosis in the midportion of the RCA, and the left anterior descending (LAD) and circumflex (LCX) coronary artery were without disease. However, the culprit lesion appeared to be a significant atherosclerotic lesion of the distal part of the DIAG branch (Fig. 1C). Because of the small caliper of the DIAG branch, only balloon dilatation (plain only balloon angioplasty, POBA) was

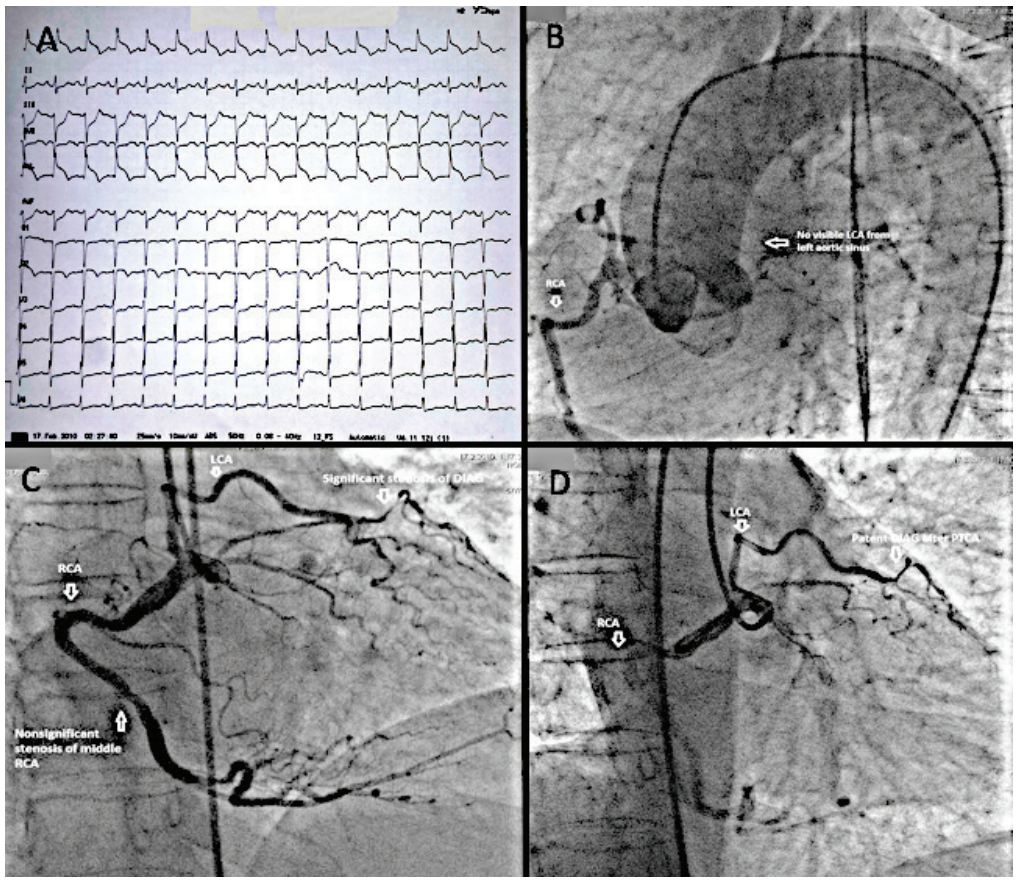

Fig. 1. (A) Electrocardiogram on admission showing sinus rhythm of 96 bpm with 3 mm ST-segment elevation in leads I and aVL, and 2 mm ST-segment depression in II, III, V3-V5; (B) aortography showing normal right coronary artery (RCA) and total occlusion of the left main trunk; (C) coronary angiography showing anomalous origin of the left coronary artery (LCA) in the right sinus of Valsalva, subocclusion of diagonal branch (DIAG) of the LCA (arrow) and nonsignificant stenosis of the RCA (arrow); (D) coronary angiography after balloon dilatation of DIAG showing optimal angiographic result (arrow).

performed with SC balloon 1.25x15 mm with TIMI 3 flow in the final angiogram (Fig. 1D). After primary angioplasty, the patient had no more symptoms of angina. At 5-year clinical follow-up, the patient was asymptomatic.

Discussion

The incidence of coronary anomalies has been reported to range between 0.6% and 1.3% in angiographic series and 0.3% in autopsy series. Anomalous origin of the LCA from the right sinus of Valsalva represents a small part of 1.3% of these anomalies, with the reported prevalence of 0.017% to 0.03% according to angiography studies[1,2]. The authors report that this anomaly is related to a higher incidence of sudden death during or shortly after exercise. Some authors present cases of acute myocardial infarction or sudden death in young patients with congenital anomalies of coronary arteries[3-5]. About half of patients with anomalous LCA arising from the right coronary sinus die before the age of 20 years, and usually during or shortly after vigorous exertion[6]. However, our patient did not have cardiac symptoms until the age of 58 years. In our case, anomaly of coronary artery was associated with obstructive coronary lesion and was successfully treated with PCI. We found significant atherosclerotic change only in the anomalous coronary artery. There was nonsignificant stenosis in the RCA. In our case, acute myocardial infarction was related to coronary artery risk factors such as diabetes, arterial hypertension and hypercholesterolemia. Generally, there are 4 different types of anomalous origin of the left main coronary artery from the right sinus of Valsalva. The inter-arterial course of the LCA, between the aortic root and pulmonary artery trunk, correlates with a higher incidence of angina, syncope and sudden death[7]. Other anatomic variants including retro-aortic course of the anomalous LCA, right ventricle free wall course and septal course, along the floor of the right ventricle, are considered benign[8]. The ideal imaging tool for the diagnosis of coronary artery anomalies is coronary angiography. Other imaging modalities such as intravascular ultrasound (IVUS), multi-slice computed tomography or magnetic resonance imaging are considered to have a complementary role in the diagnosis of coronary artery anomalies, but can reveal, if the coronary angiography is normal, whether the symptoms are related to anomalous coronary artery. In our patient, the anomalous LCA with a significant atherosclerotic lesion of DIAG branch was treated with balloon dilatation.

Conclusion

The management strategy for patients with acute STEMI and anomalous LCA is coronary angiography, IVUS and PCI, or surgical revascularization (coronary artery bypass grafting). The therapeutic choice for patients depends on the angiographic findings, namely, the site and character of the lesion.

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Sažetak

AKUTNI INFARKT MIOKARDA U 58-GODIŠNJE ŽENE S ANOMALNIM POLAZIŠTEM LIJEVE KORONARNE ARTERIJE IZ DESNOG VALSALVINA SINUSA

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Prikazujemo slučaj 58-godišnje žene koja boluje od hipertenzije, hiperkolesterolemije i dijabetesa melitusa tip 2 te koja je primljena u koronarnu jedinicu s bolovima u prsima u trajanju od dva sata. Elektrokardiogram je pokazivao infarkt miokarda sa ST elevacijom. Elevacija ST-segmenta bila je prisutna u I odvodu i aVL odvodu, a depresija ST-segmenta u odvodima II, III i V3-V5. Zabilježene su povišene vrijednosti troponina-I (1,97 ng/L). Koronarografija je pokazala anomalno polazište lijeve koronarne arterije iz desnog Valsalvina sinusa i subokluziju u proksimalnom dijelu dijagonalne grane. U zaključku, primarna perkutana intervencija (PCI) dijagonalne grane izvedena je balonskom dilatacijom uz postignut TIMI 3 protok. Nakon PCI bolesnica je bez bolova i u kliničkom praćenju od pet godina asimptomatska.

Ključne riječi: *Anomalija koronarnih arterija; Infarkt miokarda; Perkutana koronarna intervencija*