

A RARE COMPLICATION AFTER AORTIC VALVE SURGERY:A CASE REPORT

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<http://dx.doi.org/10.26739/2521-3253-2017-8-8-3>

ABSTRACT:

Coronary artery abnormalities are usually found incidentally. The most common abnormality is anomalous origin of circumflex artery. Knowing the coronary artery anomaly is particularly important in patients undergoing cardiac surgery. In valvular surgery, coronary artery damage can be found as dissection of the ostium of the coronary artery, compression of prosthetic ring to the coronary ostium or coronary artery itself laceration during the course or during the suture of the artery. It has been reviewed the approach and the therapeutic strategies in such cases because of a complication, and was encountered in one case whom was performed aortic valve replacement (AVR), that has a such coronary artery abnormality.

Keywords: Coronary anomalies, aort valve, valvular surgery

Introduction:

Coronary artery abnormalities are detected in approximately 1% of all coronary angiograms (CAG) performed. Circumflex artery (LCx) arising from right aortic cuspis is the most common abnormality (0.67%) (1). Coronary artery anomalies are detected by chance in many patients. Syncope during or after exercise, chest pain or palpitations may be associated with these conditions (2). Knowing the coronary artery abnormalities especially in critical patients undergoing cardiac surgery such as coronary bypass and prosthetic valve replacement (3,4). Here is presented a patient who had been diagnosed as compression of circumflex artery after aortic valve replacement.

Case:

A 56-year-old female with a history of type 2 diabetes mellitus, hyperlipidemia and arterial hypertension was referred because of angina during the exercises. Transthoracic echocardiography revealed: severe aortic valvular stenosis (peak gradient: 89 mmHg; Doppler valve area: 0,62 cm²), with mild-to-moderate aortic regurgitation (pressure half-time, 380 ms); and mild mitral regurgitation with normal biventricular size and function.

Preoperative coronary angiography revealed a right dominant system with no obstructive disease; the left circumflex (LCx) originated from a common ostium of the right coronary artery (RCA) and common coursed behind the aortic annulus (Fig 1).

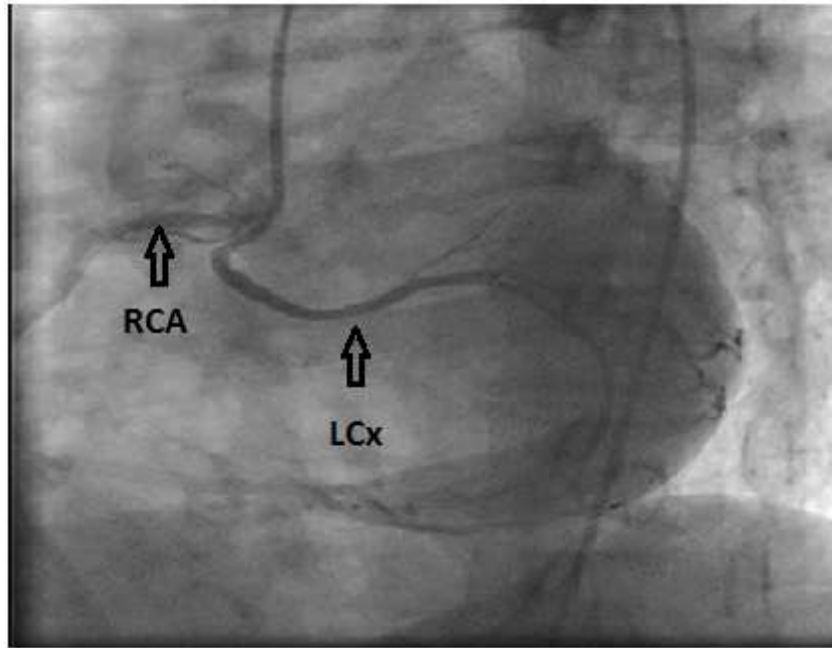


Figure 1: Preoperative coronary angiography. The anomalous left circumflex artery originated from common ostium from the right coronary artery and course behind the aortic annulus. LCx-left circumflex artery; RCA-right coronary artery.

The patient underwent aortic valve replacement. Cardiopulmonary bypass was established by cannulation in ascending aorta and both superior and inferior vena cava. The aorta was cross clamped and myocardial protection was achieved with cold blood cardioplegia. An oblique aortotomy was performed and a severely calcified bi-leaflet aortic valve was excised. Aortic root was narrow and it was extended with Nick procedure. Aortic Valve Replacement was performed (19 mm St Jude Medical (SJM) Regent™ Mechanical Valve (St. Paul, MN))

The postoperative course was uneventful and the patient was discharged on seventh postoperative day.

The patient admitted with severe chest pain on twelfth postoperative day. Myocardial ischemia was demonstrated with ST-segment elevation in the inferior leads and high troponin level (starting 1.84 ng/dl, at 4th hour 6.42 ng/dl, at 9th hour 29,07 ng/dl). Urgent coronary angiography conducted and subtotal occlusion left of the proximal LCx due to compression of the prosthesis (Fig 2).

This patient was discharged by medical treatment to come to routine controls.

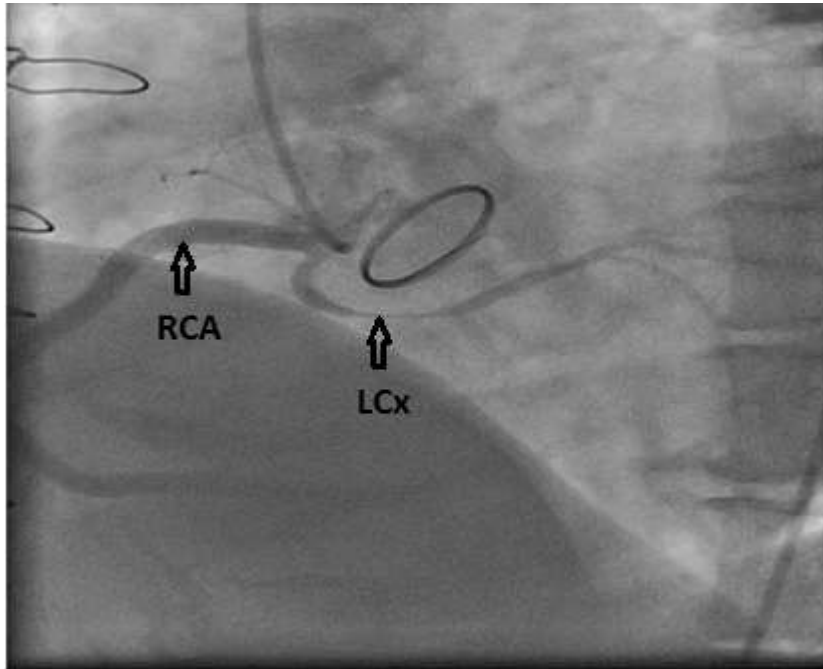


Figure 2: Postoperative coronary angiography. The anomalous left circumflex artery showed a retroaortic course with compression by the prosthetic sewing ring. LCx: Left circumflex artery RCA: Right coronary artery.

After 7 postoperative months, patient coming to emergency servis with chest pain. Electrocardiography changes and troponin elevation level were not detected. Coronary angiography revealed %60 stenosis of LCx coronary ostium and %60 compression of proximal LCx coronary artery, %90 stenosis of RCA coronary coronary ostium (Fig 3) .The patient underwent coronary bypass surgery. RCA-saphen vein graft bypass and Cx-saphen vein graft bypass were performed. The patient discharged on 8 postoperative day.

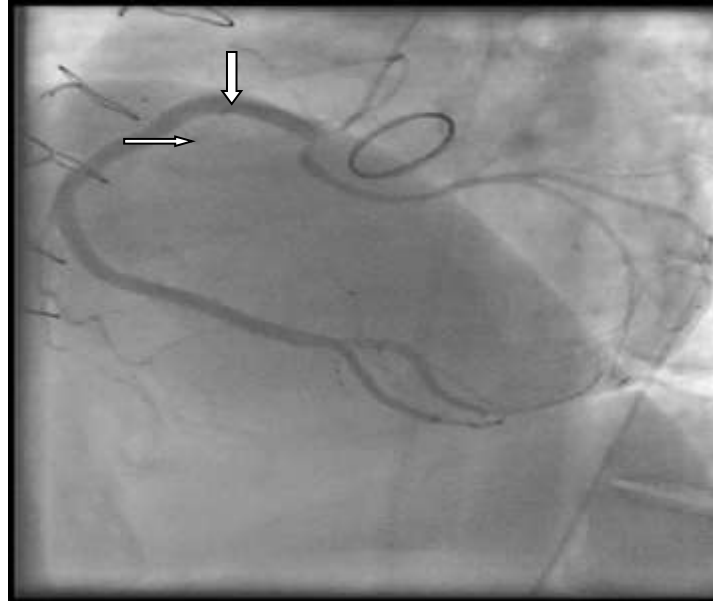


Figure 3: thick arrow showing ostial narrow of RCA coronary artery; thin arrow showing ostial narrow of LCx coronary artery.

Comment:

Coronary artery anomalies are seen as the anomaly of the origin, abnormal connection between coronary arteries and anomalous distribution. Furthermore coronary artery anomalies may be encountered as a part of complex congenital heart abnormalities (1,5). Retroaortic course of LCx is a benign condition if there is no coronary artery disease. But if the vessel anomaly is not identified, it may be the cause of serious complication for the patient who scheduled for valve replacement operation (1,3). Coronary artery injury in valve replacement operation may be seen as ostium dissection or compression of coronary ostium by prosthetic ring or suturing of the coronary artery (5).

Veinot et al. reported 29 years old patient who had bicusped aortic valve with severe aortic regurgitation and retroaortic course anomaly of LCx. They performed AVR. The patient had sudden death during exercise in postoperative 5th year. There was severe medial and fibrointimal thickening in the proximal LCx and old thrombotic occlusion in the mid portion of the artery in the autopsy findings. Also compression of LCx by aortic root and prosthetic ring

and large old and new transmural infarct lesion on lateral left ventricle were detected (5).

Vaishnava et al. reported 52 year old patient with severe aortic valvular stenosis, moderate-to-severe mitral stenosis and LCx abnormality which arise from the right coronary artery. In this case was performed aortic and mitral valve replacement. ST segment depressions and cardiac biomarkers elevated within postoperative 2 hours in intensive care unit. Coronary angiography revealed both prosthetic valve compression of the proximal LCx. (6)

In patients with abnormalities of LCx, smaller sized mechanical or biological stented aortic valve prothesis may be preferred to abstain the potential compression of coronary artery (3). Supraannular replacement of the prosthetic valve using teflon supported mattress which doesn't fold the tissue under the suture or simple single suturing technique may be the other choice. Also stentless biological prothetic valves or homografts may be used to avoid the compression in patient with LCx abnormalities (3).

During the AVR operation, in the patient with abnormalities of LCx, myocardial ischemia can be occurred because of the injury of the abnormal artery, prosthetic valve compression or insufficient myocardial protection (3). Bypass surgery is the first choice for relieving the symptoms (2). But the graft patency is suboptimal because of the competition with the patient's native blood vessels that can lead to a steal phenomenon (7). In younger patients bypass surgery option can be saved for the future requirement of revascularisation but coronary artery grafting is recommended for the elder patients with proximal native coronary artery diseases (2).

Conclusion:

Coronary artery anomalies can be found from the neonatal period without symptoms or it can be resulted with angina, congestive heart failure, myocardial infarction, cardiomyopathy, ventricular aneurysm and even sudden death (7). If the patient with coronary artery abnormalities underwent prosthetic valve surgery

or coronary bypass surgery, preoperative planning should be done by coronary angiography, magnetic resonance angiography or computed tomography angiography. Long-term course after the operation should be carefully monitored.

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