

Chronic Total Occlusion of the Left Main Coronary Artery with Preserved Left Ventricular Function: Case Report

Sol Ana Koroner Arter Kronik Tam Tıkanıklığı ile Birlikte Korunmuş Sol Ventrikül Fonksiyonu

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ABSTRACT Chronic total occlusion of the left main coronary artery at coronary angiography is a very rare finding. Many of the patients present with stable or unstable angina, but it is not easy to distinguish chronic total occlusion of the left main coronary artery from other types of severe coronary heart diseases. In this report, 55-year-old patient with chronic total occlusion of the left main coronary artery and well preserved left ventricular function was discussed. He was referred to our hospital because of slightly increased effort angina and shortness of breath. The electrocardiogram showed normal sinus rhythm and nonspecific ST-T changes. Transthoracic echocardiography demonstrated normal dimensions of the left ventricle and mild hypokinesis of the anterior wall. Coronary angiography revealed retrograde flow to the left coronary system from right coronary artery. Coronary artery bypass graft surgery was performed, and anginal symptoms were completely resolved.

Key Words: Coronary artery disease; coronary stenosis; coronary artery bypass

ÖZET Koroner anjiyografide, sol ana koroner arter kronik tam tıkanıklığı oldukça nadir bir bulgudur. Hastaların pek çoğu kararlı veya kararsız angina ile prezente olsa da sol ana koroner arterin kronik tam tıkanıklığını diğer ciddi koroner kalp hastalığı tiplerinden ayırmak kolay değildir. Bu raporda, sol ana koroner arter kronik tam tıkanıklığı ve iyi korunmuş sol ventrikül fonksiyonları olan 55 yaşındaki hasta olgusu tartışıldı. Hasta, efor anginası ve nefes darlığının hafif artış göstermesi nedeniyle hastanemize yönlendirilmişti. Elektrokardiyogramda sinüs ritmi ve özellikli olmayan ST-T değişiklikleri gözlemlendi. Normal sol ventrikül çapları ve anterior duvarda hafif hipokinezi transtorasik ekokardiyografi ile gösterildi. Koroner anjiyografi, sol koroner sistemin sağ koroner arterden doluşunu ortaya koydu. Koroner arter baypas greft cerrahisi uygulanan hastanın iskemik semptomları tamamen kayboldu.

Anahtar Kelimeler: Koroner arter hastalığı; koroner darlığı; koroner arter baypas

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Complete occlusion of the left main coronary artery (LMCA) is an extremely rare finding in coronary angiographic studies and even in postmortem examination. The rarity of this condition is due to the fact that patients usually present with sudden cardiac death. Chronic stable or unstable angina is usually the presentation in patients with chronic total occlusion of the LMCA. We report chronic total occlusion of the LMCA in a patient with preserved left ventricular function and review the clinical and angiographic features of such cases.

CASE REPORT

A 55-year-old man was admitted to our hospital with symptoms of stable angina pectoris, Canadian Cardiovascular Society class I, over the preceding 3 years. The cardiovascular examination was unremarkable. His blood pressure was reported as 120/76 mmHg. A 12-lead electrocardiogram showed normal sinus rhythm and nonspecific ST-T changes. The chest radiograph appeared normal. As far as cardiac risk factors were concerned, he had no diabetes, hypertension, hypercholesterolemia, peripheral vascular disease or family history for cardiovascular diseases. The only risk factor was being a current smoker with a 60 pack/year history. The treadmill test revealed shallow 0.1 mV ST-segment depression in II, III, V_F leads and a weak chest pain at a higher level of exercise (10 METS). Transthoracic echocardiography demonstrated normal dimensions of the left ventricle (diastolic, 50 mm; systolic, 33 mm), mild hypokinesis of the anterior wall, and an ejection fraction of about 55%. He underwent cardiac catheterization, which revealed total occlusion of the LMCA at the ostium without any antegrade flow to the left anterior descending or circumflex artery (Figure 1). The right coronary artery was dominant and without any significant lesion and supplied extensive retrograde collaterals to fill the left anterior descending and circumflex coronary arteries (Figure 2). A successful coronary artery bypass graft surgery (CABG) was performed. Left internal mammary artery and a saphenous vein graft were anastomosed to the left anterior descending artery and second obtuse marginalis branch of the circumflex artery, respectively. The patient made a full recovery and for twenty months since the operation, he has not suffered from anginal attacks.

DISCUSSION

An acute occlusion of the LMCA often leads to sudden cardiac death due to myocardial infarction resulting in cardiogenic shock. There are some reports about the successful treatment of these patients with thrombolytic therapy, urgent bypass surgery, or through percutaneous coronary inter-

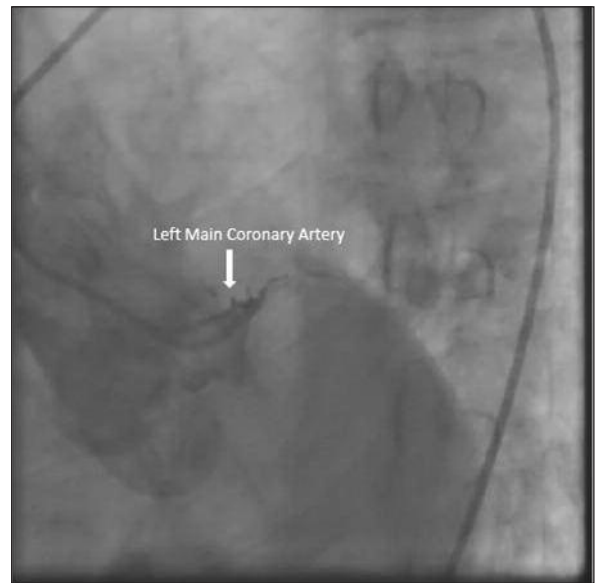


FIGURE 1: Left cusp injection showing totally occluded left main coronary artery.

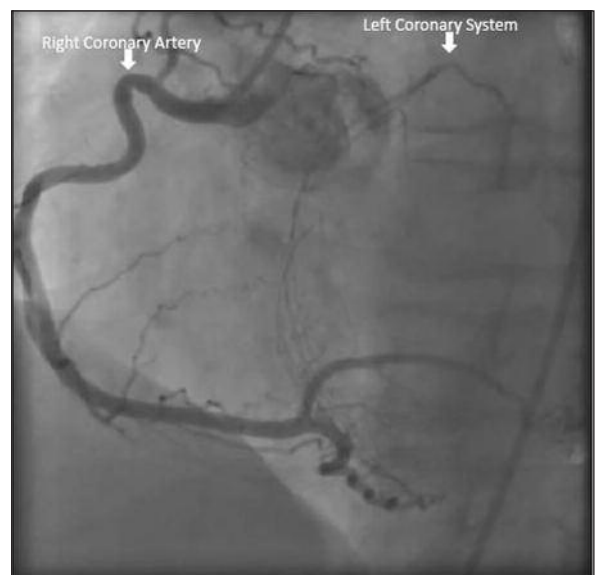


FIGURE 2: Right coronary artery injection revealing collateralization to the left system. The proximal left anterior descending and circumflex arteries were visualized.

vention leading to recanalization of LMCA.¹⁻³ Chronic total occlusion of the LMCA is rarely seen in the catheterization laboratory because of the preceding symptoms caused by other major epicardial arteries accompanying LMCA disease and the fatal hemodynamic consequences of total LMCA occlusion. The incidence of chronic total occlusion has been reported to be between 0.06%

and 0.1%.⁴⁻⁷ The majority of patients with chronic LMCA occlusion complains of recurrent typical chest pain and has a history of myocardial infarction. They may also present with symptoms of heart failure.⁸ The right dominant coronary artery system and good collateral formation from the right coronary artery are necessary for patients to survive with chronic total occlusion of LMCA. Topaz et al. emphasized the importance of collateral vessels and reported 13 collateral pathways in patients with chronic total occlusion of LMCA.⁹ However, in addition to the collateral vessels, the left ventricular function depends on the presence of significant stenotic lesions on the right coronary artery. Because the present case and also most of the previous cases with preserved left ventricular function had these three conditions, namely, the right-dominant coronary system, good collateral formation and absence of significant right coronary lesions, the amount of ischemic myocardium at risk should be relatively small and their left ventricular function could be preserved.¹⁰⁻¹² And also, the patient complained of stable angina because of a slowly-developing LMCA occlusion, therefore myocardium with ischemic preconditioning is

more resistant to the effects of ischemia, and consequently, ejection fraction may have been preserved. In the current case, electrocardiogram at rest was almost normal and ST depressions were mild on treadmill exercise test, compared with those observed in patients with LMCA lesions and poor collaterals. Surgery is the preferred treatment of choice in cases with LMCA disease as collaterals cannot be relied upon. Main problem in surgery is visualization of distal left coronary arteries and to decide whether these vessels are graftable and where the distal insertion should be sited.¹³ However, in patients with normal or near normal left ventricular functions, like present case, it is unlikely that significant distal left coronary disease is present.

In conclusion, there are a few reports of chronic total occlusion of LMCA,¹⁻¹³ however; it might be extremely rare to encounter such a patient with normal or near normal left ventricular motion and minimal symptoms despite chronic total occlusion of the LMCA except for a few cases in a literature.¹⁰⁻¹² Physicians must remember that mild stable effort angina can exist even in a patient with chronic total occlusion of the LMCA.

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