

Chronic total occlusion of the left main coronary artery: a case report

Sol ana koroner arterin kronik tam tıkanıklığı: Olgu sunumu

Doğan Erdoğan, M.D., Hakan Güllü, M.D., Mustafa Çalışkan, M.D., Haldun Müderrisoğlu, M.D.

Department of Cardiology, Başkent University, Konya Medical and Research Center, Konya

A 71-year-old man presented with shortness of breath that increased in severity within the past six hours. Medical treatment following an initial diagnosis of acute pulmonary edema improved his symptoms. Coronary angiography performed on the seventh day of admission showed total occlusion of the left main coronary artery and well-developed collateral vessels extending from the right coronary artery to the left anterior descending (LAD) and circumflex arteries. Surgical treatment included anastomosis of the left internal mammary artery to the LAD artery and an aorto-circumflex artery bypass using a saphenous graft. Postoperative period was uneventful and his complaints did not recur within a follow-up period of 10 months. The favorable prognosis was attributed to the development of collateral vessels.

Key words: Arterial occlusive diseases/diagnosis; collateral circulation; coronary angiography; coronary disease/diagnosis.

Despite the presence of many case reports of acute total occlusion of the left main coronary artery (LMCA), chronic totally occluded LMCA detected during routine coronary angiography is extremely rare. Since a large part of the myocardium is supplied by the LMCA, patients with acute totally occluded LMCA usually present with sudden death, acute myocardial infarction, and/or cardiogenic shock. Survival of these patients depends largely on emergency coronary interventions and most die in spite of an appropriate coronary intervention.

We report a case of chronic totally occluded LMCA that led to systolic heart failure and acute pulmonary edema.

CASE REPORT

A 71-year-old man was evaluated in the emergency department for shortness of breath that

Yetmiş bir yaşındaki erkek hasta, son altı saat içinde şiddeti artan nefes darlığı şikayetiyle başvurdu. Hasta, akut akciğer ödemi tanısıyla yatırıldı ve tıbbi tedavi ile şikayetleri düzeldi. Yatışının yedinci gününde yapılan koroner anjiyografide, sol ana koroner arterin tam tıkalı olduğu ve sol ön inen ve sirkumfleks arterlerinin sağdan kollaterallerle TIMI III akımla dolduğu görüldü. Hastaya koroner arter bypass greft ameliyatı yapıldı: sol ön inen artere sol internal mamariyan arter, sirkumfleks artere aorto-safen ven greft anastomozu uygulandı. Ameliyat sonrası dönemi sorunsuz geçiren hastanın 10 aylık izleminde semptomların tekrarlamadığı görüldü. Bu olumlu sonucun, iyi gelişmiş kollateral varlığı ile ilişkili olduğu düşünüldü.

Anahtar sözcükler: Arteriyel tıkanıcı hastalık/tanı; kollateral dolaşım; koroner anjiyografi; koroner hastalık/tanı.

appeared and gradually increased within the past six hours. At first sight, he was pale, sweaty and slightly cyanosed and was suffering from severe breathlessness. His blood pressure, heart rate, and breath rate were 100/70 mmHg, 110/min, and 55/min, respectively. Chest auscultation revealed rhythmic, tachycardiac heart sounds with a S3 gallop, and bilateral pulmonary crackles from the bases to both apices. An electrocardiogram (ECG) revealed sinus tachycardia and a left bundle branch block. Based on these findings, a diagnosis of acute pulmonary edema was made and medical therapy with nitroglycerine, a diuretic, and a positive inotropic agent was immediately initiated, after which his symptoms gradually abated and he was transferred to the coronary care unit. Bedside echocardiography showed decreased left ventricular systolic function with the ejection fraction of about 30% and regional left ventricular

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Correspondence: Dr. Hakan Güllü, Başkent Üniversitesi Tıp Fakültesi, Konya Araştırma ve Uygulama Merkezi Kardiyoloji Anabilim Dalı, 42080 Selçuklu, Konya. Tel: 0332 - 257 06 06 / 2111 Fax: 0332 - 247 68 86 e-mail: gulluhakan@hotmail.com

wall motion abnormalities including an akinetic and slightly dyskinetic apex and hypokinetic apical segments, anterior wall, and anterolateral region.

He had a history of transurethral prostate resection under spinal anesthesia. The left bundle branch block was also noted on his preoperative and early postoperative ECGs. Although he had an uneventful postoperative period, he developed chest pain squeezing in nature and subsequent shortness of breath on the withdrawal of the urethral catheter at the eighth day of the operation. His symptoms progressed and he was referred to our hospital on the 12th day of the operation.

On medical therapy, pulmonary crackles disappeared within 48 hours and cardiac enzyme levels (creatinine kinase, creatine kinase isoenzyme MB, and troponin I) increased slightly. Follow-up ECG recordings did not show any significant change, but a slow-down of the sinus rate. On the seventh day of hospitalization, he underwent coronary angiography according to the Judkins' technique, with his hemodynamic condition stabilized. Injection in the left coronary system demonstrated that the LMCA was totally occluded at its ostium (Fig. 1). Right coronary injection revealed an open right coronary artery and well-developed collateral vessels supplying the left anterior descending (LAD) and circumflex arteries from distal to the proximal parts (Fig. 2). The distal part of the LMCA and the ostial parts of the LAD and circumflex arteries did not appear. It was thought that the chronic serious obstruction of the proximal parts of the two arteries might have caused early development of the collateral vessels before total occlusion occurred.

The patient was treated surgically. The left internal mammary artery was anastomosed to the LAD artery and an aorto-circumflex artery bypass was performed using a saphenous graft. Following an uneventful postoperative period, he was discharged with appropriate medical therapy. After 10 months of follow-up, he had no complaints.

DISCUSSION

Due to the fact that the LMCA supplies a large part of the myocardium, patients with a total occlusion of LMCA were generally believed to have a fatal prognosis. Detection of a totally occluded LMCA by elective coronary angiography is extremely rarely. The incidence of totally occluded LMCA ranges between 0.06 and 0.1%, with the majority of cases being documented during emergency coronary angiography.^[1-3]

Acute total occlusion of the LMCA generally causes massive anterior myocardial infarction that may often result in sudden death. However, the advent of primary percutaneous coronary angioplasty has considerably improved the prognosis of these patients. There are tens of case reports of successful treatment of acute totally occluded LMCA by timely coronary interventions;^[4] A relatively poor long-term survival is mainly associated with delayed duration between the onset of symptoms and an appropriate coronary intervention.^[5]

In our case, the patient presented with shortness of breath and pulmonary edema and the relief of the symptoms after medical therapy somewhat distracted our attention from a total occlusion of the LMCA.



Fig. 1. The right coronary artery, well-developed collaterals, and totally occluded left main coronary artery (A. Embedded small view).



Fig. 2. Collateral vessels supplying the left coronary system from the right coronary artery.

Therefore, we did not attempt an emergency revascularization. Coronary angiography performed on the seventh day of hospitalization suggested that chronic serious obstruction of the proximal parts of the LAD and the circumflex arteries caused early development of the collateral vessels before total occlusion occurred.

According to the definition proposed by the American College of Cardiology, chronic total occlusion of a coronary artery usually occurs within three months; however, this period particularly refers to the culmination of the total occlusion to such an extent that it cannot be opened by percutaneous interventions.^[6] However, the natural course of total occlusion may be variable.^[7] In our case, the lack of antegrade flow in the LAD and the circumflex arteries, the presence of a well-developed collateral circulation with TIMI 3 retrograde filling, minimal increases in the levels of myocardial enzymes indicating a lesser degree of myocardial involvement led us to the conclusion that the occlusion of the LMCA was chronic.

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