

A CASE REPORT: ACUTE THROMBOSIS OF THE LEFT SUBCLAVIAN ARTERY AND ACUTE CORONARY SYNDROME SECONDARY TO CARBON MONOXIDE INTOXICATION

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Karbonmonoksit (CO) zehirlenmesi; CO'in tatsız, kokusuz olması ve zehirlenme semptomlarının spesifik olmaması nedeniyle sıklıkla gözden kaçırılan bir zehirlenmedir. CO maruziyeti sonrası karboksihemoglobin düzeyinin %20 seviyesini aşması sonucu beyin ve kalp ciddi olarak etkilenebilir. Zehirlenmenin nörolojik etkileri iyi tanımlanmış olmasına rağmen, kardiyovasküler sonuçları; EKG değişiklikleri, myokard fonksiyon bozukluğu ve myokard infarktüsünü gösteren izole olgu sunumlarıyla sınırlıdır.

Sol internal mammarial arter- sol ön inen arteri (LIMA-LAD) içeren koroner arter bypass greft operasyonu öyküsü olan ve CO zehirlenmesine bağlı akut sol subclavian arter tıkanmasına bağlı

myokard infarktüsü gelişen bir olguyu sunacağız. Hastaya uygulanan perkütan transluminal angioplasti girişimi sonrası sol subclavian arter açıklığı ve LIMA-LAD bypass akımı sağlandı.

Bilgilerimize göre CO zehirlenmesine bağlı subclavian arter akut trombozu ve buna bağlı gelişen akut myokard infarktüsü olgusu nadir bir durum olup daha önce rapor edilmemiştir.

Anahtar kelimeler: Akut koroner sendrom, Karbonmonoksit zehirlenmesi, Subclavian arter oklüzyonu, Tromboz

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INTRODUCTION

Carbon monoxide (CO) poisoning can cause myocardial infarction, arrhythmias, hypotension or even death, because of direct myocardial injury, induced coronary artery spasm or thrombus formation^{1,2}. We describe a case of acute occlusion of the left subclavian artery accompanying myocardial infarction due to CO poisoning, in a patient with prior coronary artery by-pass grafting surgery (CABG), including a graft of the left internal mammarian artery (LIMA) to the left anterior descending artery (LAD).

CASE REPORT

A 78-year-old woman with a history of CABG surgery (LIMA-LAD, Ao-Circumflex (Cx) saphenous, Ao- Right Coronary Artery (RCA) saphenous), type 2 diabetes mellitus and hypertension was admitted to the emergency department, because of atypical chest

pain, transient unconsciousness, nausea and vomiting. Three hours before admission, the patient had been exposed accidentally to CO at home while she was sleeping. On her physical examination, the heart rate was 73 bpm with a blood pressure of 110/80 mmHg. The cardiovascular examination revealed a regular rhythm with an S3 and a grade III holosystolic murmur heard best at the apex. ECG showed T wave inversion in leads D1- aVL and V1 to V6. Chest X-ray showed clear lung fields but also an enlarged cardiac silhouette. Blood levels of carboxyhemoglobin and troponin-T were 25% and 18 microgram/L, respectively. Arterial blood gases analyses revealed metabolic acidosis. So the patient was consulted by a cardiologist for the ECG changes and subsequently the patient was hospitalized to the coronary intensive care unit with a diagnosis of acute coronary syndrome secondary to CO poisoning and medical treatment for myocardial infarction was applied and supplemental O2 was given by a nasal cannula (10 L/min), immediately.

Transthoracic echocardiographic examination showed anterior left ventricular (LV) hypokinesis and the ejection fraction was calculated as 35% (Simpson's method, biplane), however she had a history of normal

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Figure 1: Arcus aortography, antero-posterior view. Thrombus (arrow) is seen at the proximal segment of the left subclavian artery.

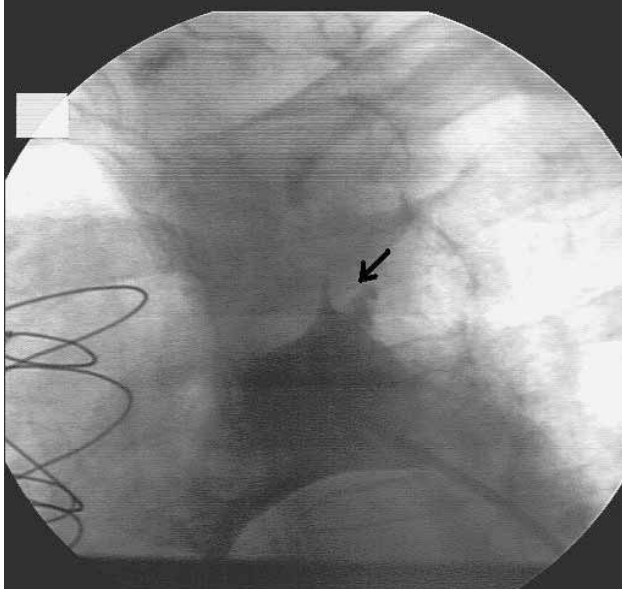
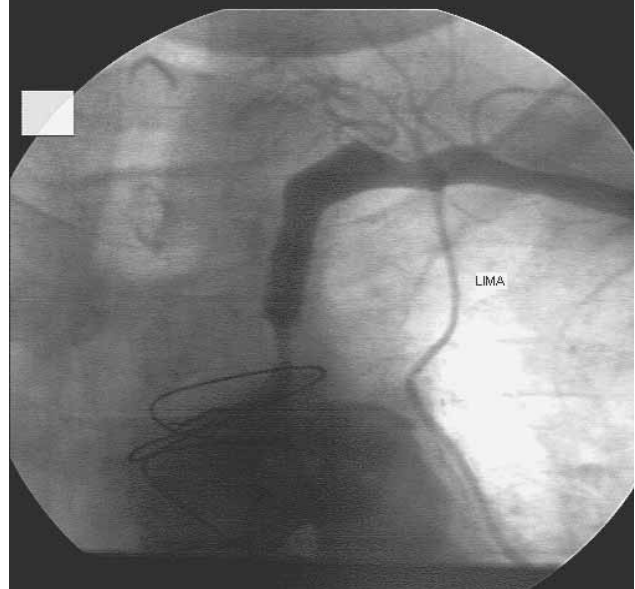


Figure 2: Arcus aortography, antero-posterior view. After percutaneous transluminal angioplasty of the left subclavian artery, LIMA was visualized.



LV systolic function about four months ago. Since the patient's chest pain persisted and her hemodynamics began to deteriorate, coronary angiography (CAG) was performed immediately, by the right femoral artery approach. The CAG showed occlusion in the LAD, Cx, RCA and the saphenous vein graft to RCA, and patency in the saphenous vein graft to Cx. In an attempt to look for the LIMA, we couldn't find the left subclavian artery. So we performed an aortic arch angiography and demonstrated the left subclavian artery 100% occluded with a thrombus (Figure 1). Hence we inserted a 8F right Judkins guiding catheter to the left subclavian artery ostium, crossed with a floppy guide wire and positioned a percutaneous transluminal angioplasty (PTA) balloon (3.0x20 mm, at 10 atm pressure, turquoise balloon) on the occluded region, the proximal portion of the left subclavian artery. PTA was performed with success and after contrast injection we have seen the LIMA (Figure 2) and TIMI-III distal flow through the LAD restored. Unfortunately, hemodynamic parameters deteriorated and cardiopulmonary arrest developed soon after the procedure. So cardiopulmonary resuscitation was applied for about one hour, unfortunately we did not succeed and the patient died.

DISCUSSION

CO, a highly toxic molecule, binds rapidly to hemoglobin and leads to formation of carboxyhe-

globin. So the oxygen carrying capacity of blood decreases and tissue hypoxia develops. Hypoxia can induce vasospasm and thrombus formation by slowing the blood stream, increasing the permeability of the vessel walls and platelet aggregability. So CO poisoning can cause myocardial infarction, arrhythmias, hypotension or even death, because of direct myocardial injury, induced coronary artery spasm or thrombus formation^{1,2}.

Descriptions of the cardiovascular manifestations of CO poisoning in humans are limited to some case reports. Since Colvin³ in 1928, many researchers like Stearnes⁴, Anderson², Corya⁵ demonstrated thromboembolic events and myocardial infarction due to CO poisoning, but did not report any subclavian artery thrombosis.

In this case report we described an acute thrombosis of the left subclavian artery leading to an acute coronary syndrome with revascularization of the subclavian artery by percutaneous intervention and restoration of the flow through LIMA and LAD. Our patient's chest pain relieved after the procedure but soon after the procedure hypotension and bradycardia developed. She did not respond to CPR and died.

To the best of our knowledge, acute occlusion of the subclavian artery accompanying myocardial infarction is an uncommon and previously unreported result of CO poisoning. So this reason among acute

coronary syndromes could be overlooked.

In conclusion, in a patient with neurologic symptoms and atypical cardiac complaints or acute coronary syndrome, secondary reasons like CO intoxication should be beared in mind and aggressive treatment should be started quickly.

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