

Acute coronary syndrome with intraventricular thrombus after using erythropoietin



Eritropoetin kullanımı sonrası intraventriküler trombus ile birlikte akut koroner sendrom

Introduction

Erythropoietin (EPO) is a hemopoietic hormone, which controls erythropoiesis, produced by the renal interstitium in response to hypoxia (1). Furthermore, erythropoietin receptors were found on endothelial cells, fibroblasts and cardiomyocytes (1). Erythropoietin was associated with significant reduction in infarct size and apoptosis, improvement in ischemia-induced neovascularization and increase in left ventricular function (2-5).

We describe a professional wrestler, who had taken intravenous EPO with the intention of doping 1 day before the contest, with acute coronary syndrome (ACS) with intraventricular thrombus.

Case report

A-29-year-old professional wrestler man was referred with a history of substernal chest pain and cold sweating during a traditional oil wrestling contest. He confessed intravenous erythropoietin 4000 i.u. usage with the intention of doping 1 day before the contest. He had not the medical history of diabetes, hypertension, smoking nor family history. Physical examination and laboratory findings were normal (total cholesterol: 176 mg/dL, high-density lipoprotein cholesterol: 46 mg/dL, low-density lipoprotein cholesterol: 99 mg/dL and triglyceride: 155 mg/dL). ECG showed ST-T changes in leads V1 to V6 (Fig. 1a). Two-dimensional transthoracic echocardiography (TTE) showed akinesia of the anterior, septal and apical segments with apical thrombus (1.1cm x 1.1 cm) (Fig. 1b). Left ventricular ejection fraction was 45%. Coronary angiogram was performed, which revealed widespread thrombus in the mid and distal left anterior descending coronary artery (Fig. 2a, Video 1-3. See corresponding video/movie images at www.anakarder.com). A decision of medical therapy and periodic follow up was made. Intravenous tirofiban was administered for 2 days. But also simultaneously acetylsalicylic acid 300 mg/d, clopidogrel 75 mg/d, metoprolol 25 mg bid, simvastatin 20 mg/d were given orally. One week later a control coronary angiogram and TTE were performed which showed nearly total resolution of intracoronary thrombus (Fig. 2b) and intraventricular thrombus. The patient was made an uneventful recovery and was discharged on the seventh day. The patient was called via telephone five years later. He is very good in condition and he is continuing oil wrestling with having some championships.

Discussion

Erythropoietin has long been identified as a primary regulator of erythropoiesis. In particular, the tight interactions of EPO with the nitric oxide pathway, apoptosis, ischemia, cell proliferation and platelet activation appear of great interest (2-5). Erythropoietin was associated with significant reductions in infarct size and apoptosis, improvements in ischemia-induced neovascularization, increases in left ventricular function and preventions of ventricular remodeling (2-5). Erythropoietin might reduce the infarct size by inhibiting apoptotic cell death. Nevertheless, this reduction in myocardial damage was accompanied by prevention of left ventricular dilation and improved left ventricular ejection fraction. Although enhanced EPO synthesis is viewed as an appropriate compensatory mechanism in the cardio-renal syndrome, which features conges-

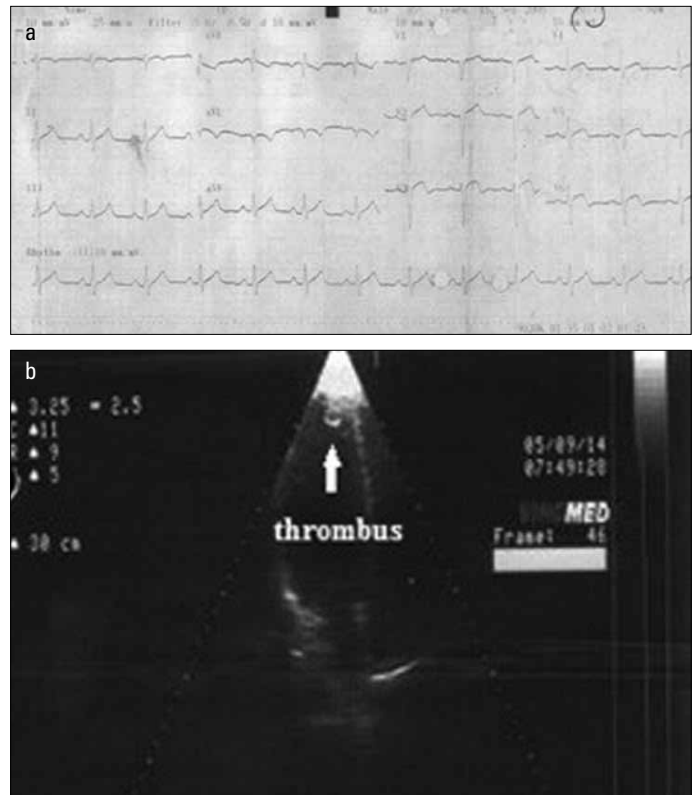


Figure 1. a) Electrocardiogram showing ST changes in V3-V6 leads b) Echocardiography showing an apical thrombus in left ventricle

tive heart failure and chronic renal failure, maladaptive excessive EPO synthesis in the advanced stages of these diseases appears to be predictive of higher mortality. Increased EPO values may lead to hypertension, seizures, vascular thrombosis, thromboembolism and death, possibly related to abruptly increased hematocrit values (6).

A case of late thrombosis of a sirolimus-eluting stent, 16 months after implantation, is described (7). Two weeks prior to presentation with stent thrombosis the patient had a 50% dose increase of long term erythropoietin. In patients with STEMI who had successful reperfusion with primary or rescue PCI, a single intravenous bolus of epoetin alpha within 4 hours of PCI did not reduce infarct size and was associated with higher rates of adverse cardiovascular events (8).

The prothrombotic effect of erythropoietin may have precipitated the thrombotic event. The precise mechanism by which EPO induces a thrombotic event, remains unclear. Prothrombotic effect of EPO might associated with abruptly increased hematocrit values, enhanced platelet production or reactivity, stimulation of endothelial cells or reduced coagulation inhibitors (9, 10).

We reported a case of ACS thought to be associated with using intravenous EPO. The presence of both intracoronary and intraventricular thrombus is very interesting. Intracoronary thrombus may be related to embolism of intraventricular thrombus.

Even to date, there is no consensus as to the best management when treating ACS caused by coronary thrombus. In this case, tirofiban infusion achieved successful treatment intracoronary and intraventricular thrombus.

Conclusion

When intracoronary thrombus is detected with coronary angiography, we must investigate an intraventricular thrombus and using an unusual drugs or using drug abuse in young patients.

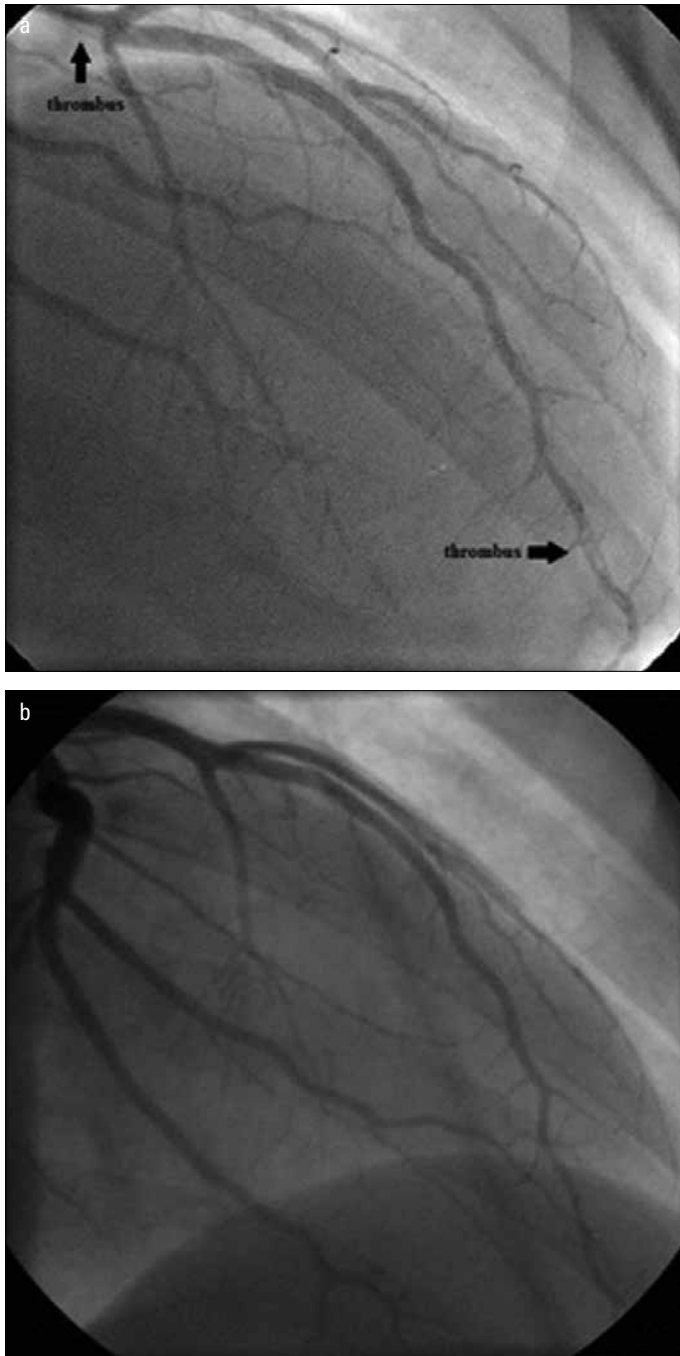


Figure 2. a) Thrombi are seen in the mid (extending to first septal artery) and distal left anterior descending artery, b) Thrombi are seen disappeared on control angiography

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Video 1. Coronary angiography showing a thrombus in the distal left anterior descending artery (antero-posterior caudal view)

Video 2. Coronary angiography showing thrombi in the mid (extending to first septal artery) and distal left anterior descending artery (right anterior oblique cranial view)

Video 3. Thrombi are seen in the mid (extending to first septal artery) and distal left anterior descending artery (lateral view)

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Variant high origin of both right and left coronary arteries from the ascending aortic wall

Çıkan aort duvarından yüksek kökenli hem sağ ve sol koroner arter

Introduction

We report here the interesting case of anomalous origin of both coronary arteries. The prevalence of high takeoff (more than 1 cm above the sinotubular junction) is reported as 6% (1, 2). Presence of coronary artery anomalies may create challenges during coronary