



# Myocardial Ischemia on MPI SPECT in a Patient with Acute Myeloid Leukemia Without Significant Coronary Artery Disease

*Ciddi Koroner Arter Hastalığı Olmayan Akut Miyeloid Lösemili Bir Hastada MPI SPECT'de Miyokard İskemisi*

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## Abstract

Herein, we report the case of a 56-year-old male patient with acute myeloid leukemia (AML) in remission who had asymptomatic myocardial ischemia on myocardial perfusion imaging and transthoracic echocardiography. Angiography did not reveal any significant coronary artery disease. Although the etiology is not entirely clear, this case suggested that myocardial perfusion imaging should be considered in patients with AML who received idarubicin to screen for possible myocardial dysfunction.

**Keywords:** Acute myeloid leukemia, myocardial ischemia, myocardial perfusion imaging, echocardiography, angiography, coronary artery disease

## Öz

Bu çalışmada, miyokard perfüzyon görüntüleme ve transtoraks ekokardiyografide asemptomatik miyokard iskemisi saptanan, remisyondeki akut miyeloid lösemili (AML) 56 yaşında bir erkek hastayı sunuyoruz. Anjiyografide ciddi bir koroner arter hastalığı saptanmadı. Etiyolojisi tam olarak net olmamakla birlikte, bu olgu, olası miyokardiyal disfonksiyon taraması için idarubisin alan AML hastalarında miyokard perfüzyon görüntülemesinin düşünülmesi gerektiğini ortaya koymuştur.

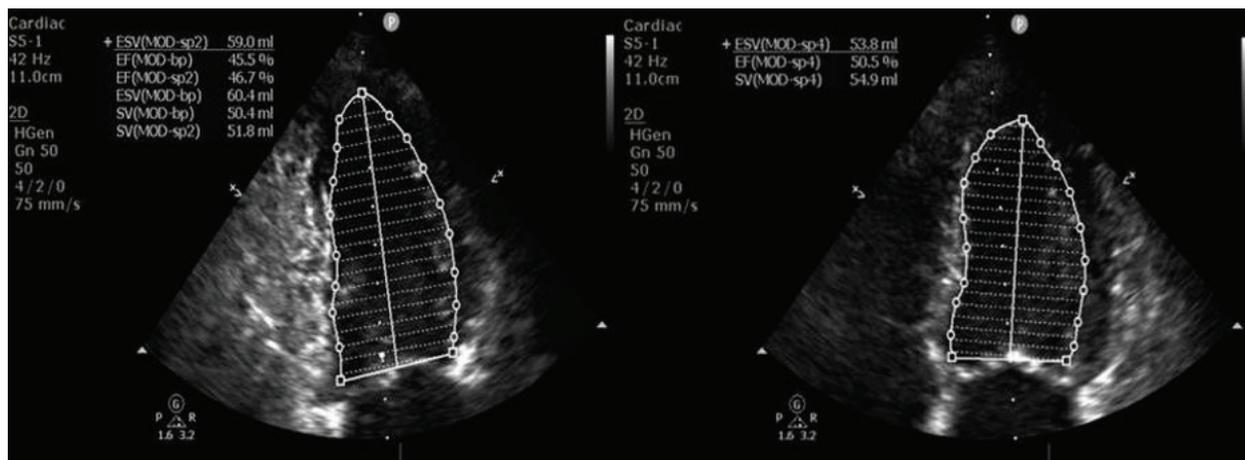
**Anahtar kelimeler:** Akut miyeloid lösemi, miyokardiyal iskemi, miyokardiyal perfüzyon görüntüleme, ekokardiyografi, anjiyografi, koroner arter hastalığı

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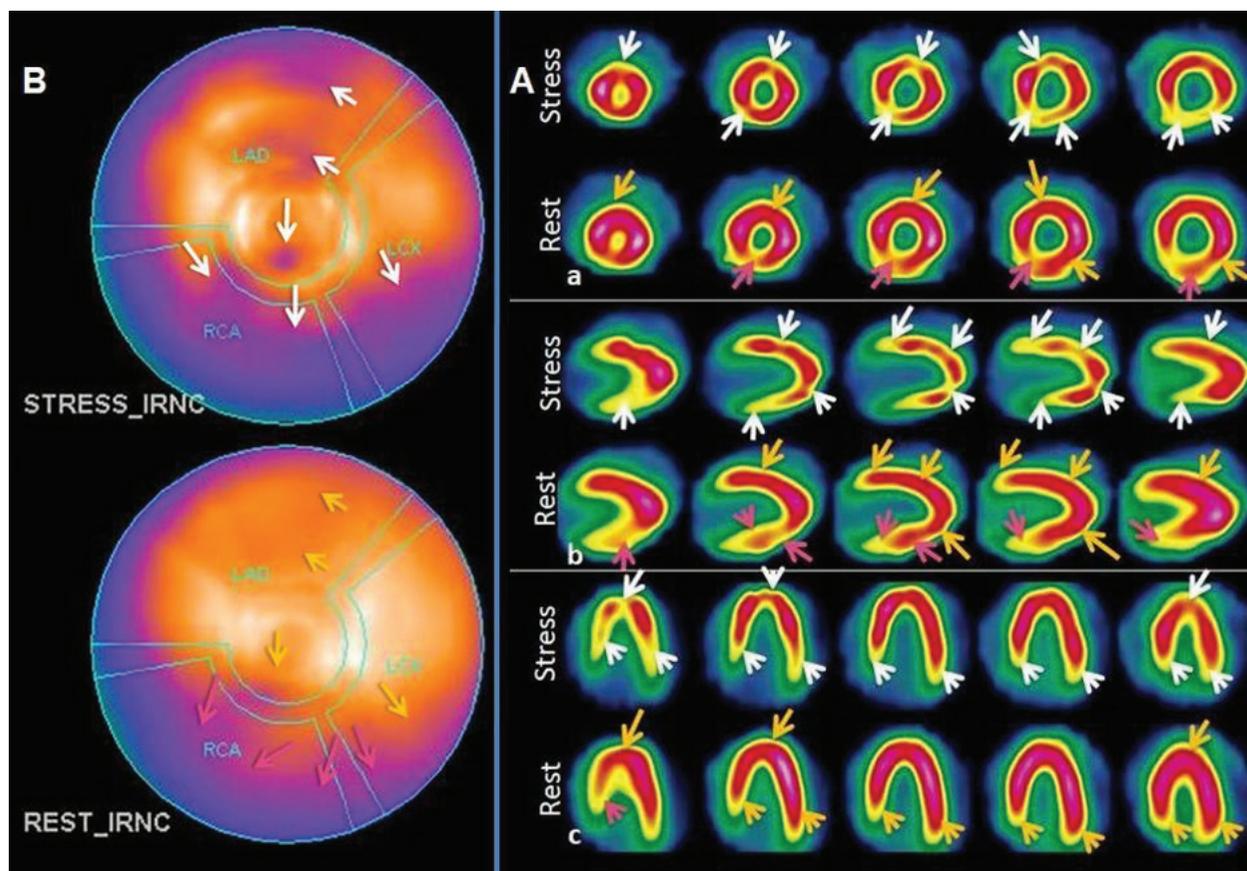
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**Received:** 26.06.2020 **Accepted:** 18.10.2020

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Molecular Imaging and Radionuclide Therapy published by Galenos Yayınevi.

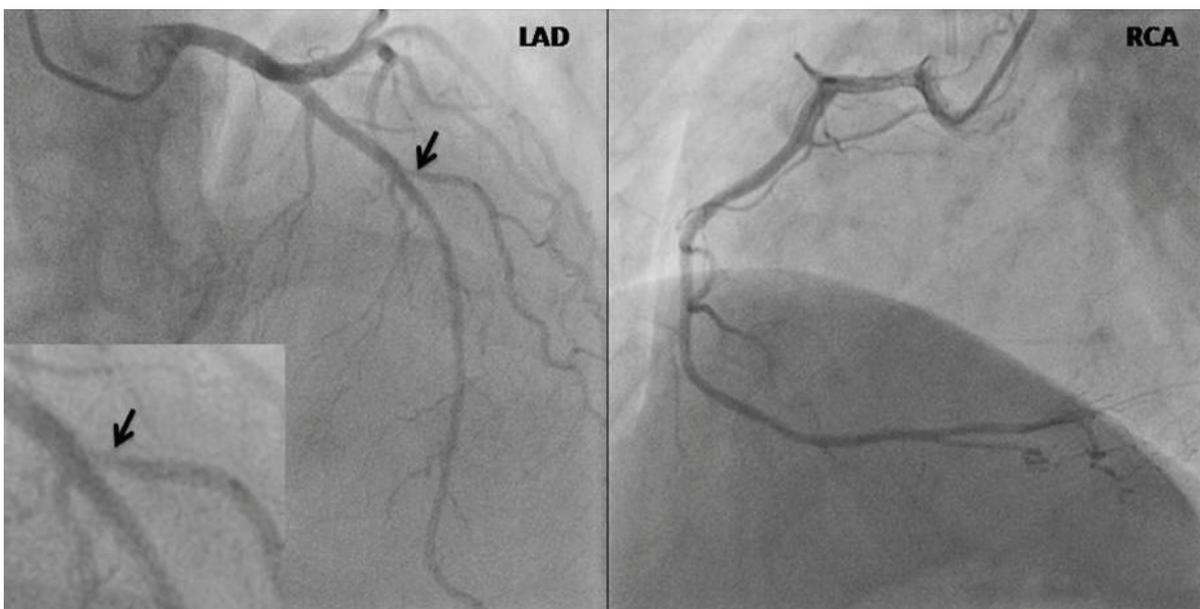


**Figure 1.** A 56-year-old male patient with atrial fibrillation was diagnosed with acute myeloid leukemia (AML) in August 2019 and treated with idarubicin at 12 mg/m<sup>2</sup>/d for 3 days and aracytin at 200 mg/m<sup>2</sup> for 7 days, achieving complete remission. Seven months after the diagnosis of AML, he suffered a left hemispheric stroke, due to atrial fibrillation. Transthoracic echocardiographic study showed mild-moderate systolic left ventricle dysfunction (ejection fraction of 45-50%) with hypokinesia in the basal inferior intraventricular septum and middle inferior and anterior walls.



**Figure 2.** For further evaluation, myocardial perfusion imaging (MPI) was performed using a one-dimensional imaging protocol. No gated single-photon emission computed tomography was applied. Stress protocol and imaging were performed according to published guidelines and as previously reported (1). MPI results were similar to those of echocardiology, as seen in the Bulls-eye MPI image, which depicts the entire myocardium (A) and 3 axis images: a) Short axis, b) vertical axis, and c) horizontal axis (B). White arrows point to the hypoperfused areas during stress: Apical and basal anterior, inferior-septal, median, and basal areas of inferior and inferior-lateral wall, and a segment of the apical cardiac wall (seen in the center, A).

Yellow arrows point to the reversible and pink to the partially reversible areas at rest. The reversible ischemic parts of the myocardium involve the apical and basal anterior and inferior-septal and median areas of the inferior-lateral and apical cardiac walls. Partial reversibility was seen in the remaining hypoperfused areas. The difference in the stress and rest images indicates the reversibility of myocardial ischemia. MPI is an imaging method for myocardial evaluation (2), which detects myocardial ischemia when coronary artery stenosis (CAD) produces a reduction in blood flow of >50%, with a sensitivity and specificity of 86% and 74%, respectively (3).



**Figure 3.** The patient underwent coronary angiography that showed no significant CAD. The left anterior descending artery showed a non-significant (<50%) stenosis. The right coronary artery was also depicted without stenosis. Myocardial dysfunction without significant CAD has occasionally been reported in some medical conditions (4,5). Leukostasis in AML may cause significant CAD (6); however, insufficient hemodynamic stenoses in the coronary angiogram argue against this etiology. Furthermore, the intake of idarubicin, a possible cardiotoxic drug in total doses over 290 mg/m<sup>2</sup> (7), is unlikely to be the main etiology of myocardial ischemia in this patient since the received dose was only 69 mg/m<sup>2</sup>. Another contributing factor could have been myocardial ischemia secondary to leukemic cell infiltration, an exceedingly rare and unproven AML complication (8).

In any event, cardiac surveillance with MPI and/or cardiac ultrasonography in patients with AML on idarubicin should be considered to prevent and treat myocardial dysfunction.

## Ethics

**Informed Consent:** Written informed consent was obtained from the patient.

**Peer-review:** Externally peer-reviewed.

## Authorship Contributions

Surgical and Medical Practices: A.B., C.K., C.S., Concept: A.F., E.K., S.G., Design: C.S, C.K., A.B., Data Collection or Processing: E.N., A.F., Analysis or Interpretation: C.K, S.G., E.K., Literature Search: C.S, E.N., E.K., Writing: C.S, C.K.

**Conflict of Interest:** No conflict of interest was declared by the authors.

**Financial Disclosure:** The authors declared that this study received no financial support.

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