

# A free floating left atrial ball thrombus treatment with oral anticoagulation

## *Oral antikoagülasyon ile tedavi edilen serbest yüzen sol atriyal top trombüsü*

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### Abstract

Transesophageal echocardiography (TEE) revealed a free-floating left atrial ball thrombus in a 56-year-old male patient who was taking warfarin for mechanical prosthetic mitral valve and had recently short-term warfarin interruption for noncardiac surgery and bridging with enoxaparin was admitted to an external center for left abdominal pain and after the detection of spleen and renal infarct, the patient was referred to us for further examination. The patient, who was considered to be at high risk for surgical intervention by the cardiac surgeons, was treated with a warfarin regimen and on the 14th day of the treatment, computed tomography (CT) scan showed that the thrombus disappeared. According to this case report, if patients who have a free-floating left atrial ball thrombus are at high risk for surgical intervention, warfarin therapy can be considered as an alternative to surgery.

**Key words:** Anticoagulation, echocardiography, thrombus.

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### Öz

Dış merkeze karın ağrısı nedeniyle başvurup böbrek ve dalakta enfarktüs saptanması nedeniyle ileri inceleme için hastanemize yönlendirilen, mekanik protez mitral kapak nedeniyle varfarin almakta olan ancak yakın zamanda kalp dışı cerrahi nedeniyle varfarin kesilip enoksaparin ile tedavi öyküsü olan 56 yaşındaki bir erkek hastaya tarafımızca yapılan transözofageal ekokardiyografide (TEE) serbest yüzen sol atriyal top trombüsü saptandı. Kalp cerrahları tarafından cerrahi müdahale açısından yüksek riskli olarak değerlendirilen hasta, varfarin rejimi ile tedavi edildi ve tedavinin 14. gününde bilgisayarlı tomografi (BT) taramasında trombüsün kaybolduğu görüldü. Bu olgu sunumuna göre, serbest yüzen sol atriyal top trombüsü olan hastalar cerrahi girişim açısından yüksek risk altındaysa, cerrahiye alternatif olarak varfarin tedavisi düşünülebilir.

**Anahtar kelimeler:** Trombüs, antikoagülasyon, ekokardiyografi.

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### Introduction

Thrombus that moves freely in the left atrium and is not attached to any wall is called left atrial ball thrombus (LABT), [1]. As previously described by Hisatomi et al. [2], a free-floating thrombi in the left atrium that do not attach to the atrial wall or mitral valve are extremely rare, however as a source of embolism, it can lead to potentially catastrophic consequences.

A free-floating ball thrombus is most commonly detected in mitral stenosis, left atrial dilatation, atrial fibrillation and congestive heart failure. Mitral stenosis and a dilated left atrium induce blood stasis, resulting in thrombus

formation, [3]. As it is known, treatment options in LABT are anticoagulant therapy, thrombolytic infusion and surgical treatment.

In this case report, we present a patient with LABT that we treated with oral anticoagulant. Our aim is to present our observations about the approach to be followed in patients with LABT.

To the best of our knowledge, all but one of the patients with left atrial thrombus causing peripheral embolization, reported so far, were treated surgically [4]. Therefore, the case we present is the second case successfully treated with oral anticoagulation.

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## Case report

A 56-year-old male patient was admitted to another health center due to left sided and abdominal pain lasting for 2-3 days and abdominal CT was performed in there. On contrast-enhanced abdominal CT, there is an appearance of acute infarction in the cortical area of left kidney, especially in the upper pole and middle part. Also hypodense areas were observed in the anterior and middle parts of the spleen, making us to think infarct areas due to arterial embolism. Therefore, the patient was referred to us as a more advanced center for diagnosis and treatment.

The patient had mechanical mitral valve replacement and atrial septal defect repair performed in 2007. The ECG revealed atrial fibrillation with an average ventricular rate of 105 beats/min. He had received an anticoagulation regimen with warfarin since mechanical mitral valve replacement but warfarin therapy was interrupted and bridging was done with enoxaparin due to the bronchoscopy and endobronchial ultrasound processes 15 days ago. Factor Xa was not evaluated during short-term enoxaparin therapy. It was seen from the hospital records of the patient that the preoperative PT-INR value was 1 and when the patient applied to us, it was 1.6. The warfarin therapy was discontinued a week before the operation. After the operation, the patient used warfarin irregularly.

Initially, we performed Transthoracic Echocardiography (TTE) for the investigation of infective endocarditis and thrombus, showed a dilated left atrium (LA) (60 mm), mitral valve area was found as 2.65 cm<sup>2</sup> with a mean gradient of 7 mm Hg. Usual characteristics of a ball thrombus in the LA was not examined in 2 and M-mode echocardiographic examinations. TTE confirmed normal prosthetic valve.

We decided to perform TEE when no

evidence of infective endocarditis or thrombus was detected by TTE. TEE suspected the existence of a free floating thrombus sizing 16\*13 mm (Figure 1, Video 1). No connection could be demonstrated between the mass and the atrial wall, and the mass was seen to moving freely (Figure 1, Video 2).

We performed cardiac CT for a more detailed analysis of the findings we obtained with TEE. Giant thrombus was observed in the left atrium (Figure 2), and there are diffuse infarcts in both kidneys on CT performed in our center. Moreover, a decrease in density was observed in the spleen parenchyma and infarctions were seen in the middle and lower pole posterior sections. Emergency surgical intervention was not planned for the patient by the general surgeons.

He had productive cough. WBC was 15.98 k/uL and CRP was 294 mg/L in his blood analysis. Therefore, samples for blood cultures and procalcitonin were taken from the patient. Procalcitonin value was 0.395 ng/ml and there was no bacterial growth in blood culture. Additionally, for the investigation of infective endocarditis, Spect-CT performed and no pathological involvement was observed in the cardiac area and around the prosthetic valve material.

Due to very high risk of new embolic events and surgical treatment did not advised by the cardiac surgeons, intensive anticoagulation therapy was considered as a treatment. In addition, thrombolytic therapy was not preferred primarily because the patient had a recent history of surgical intervention and peptic ulcer. Thus, we adjusted the warfarin therapy by trying to keep the PT-INR:3-4

CT angiography was performed after 14 days of treatment. Free floating or fixed thrombus was seen neither in the LA (Figure 3) nor inside the left atrial appendage.

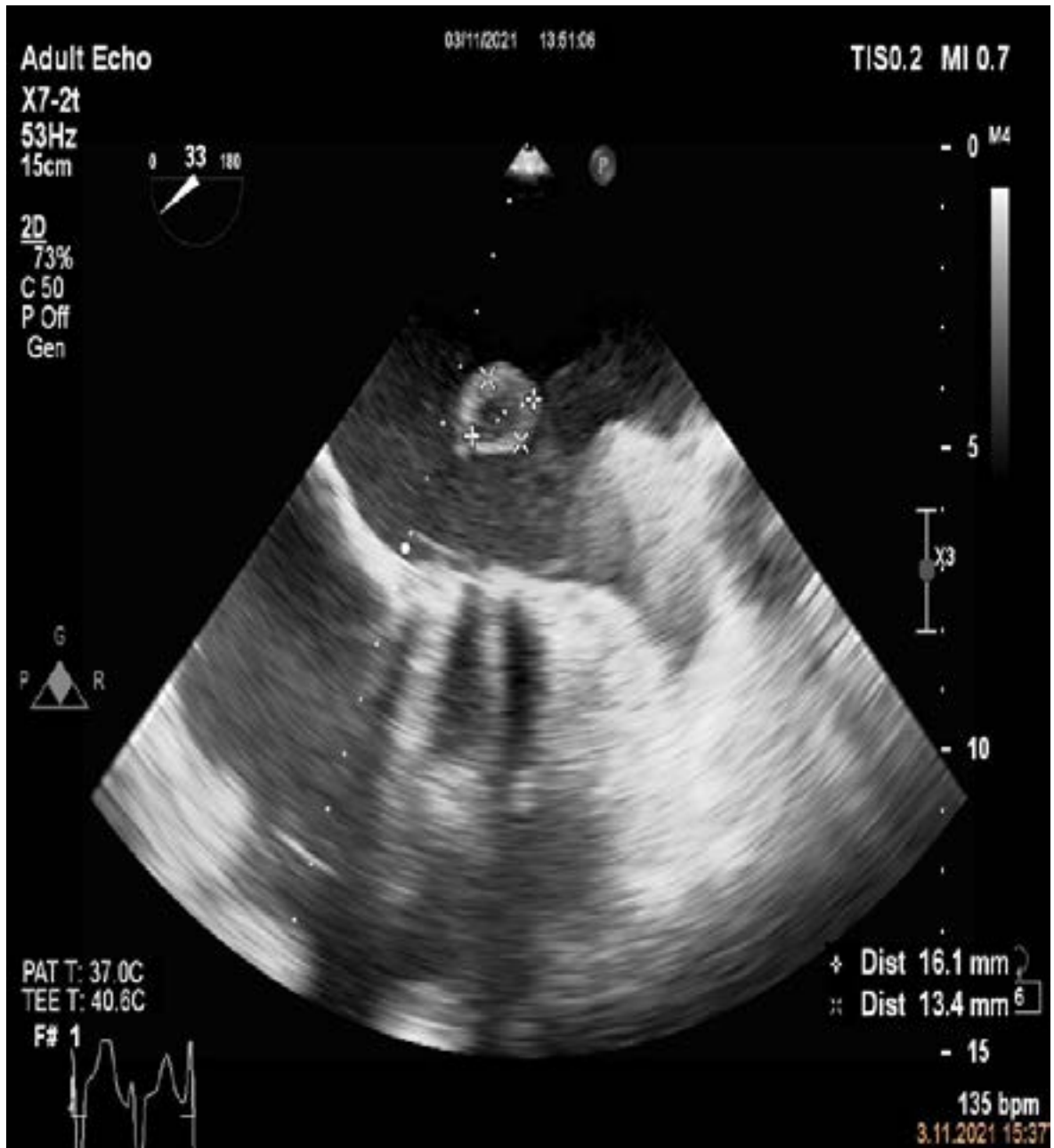
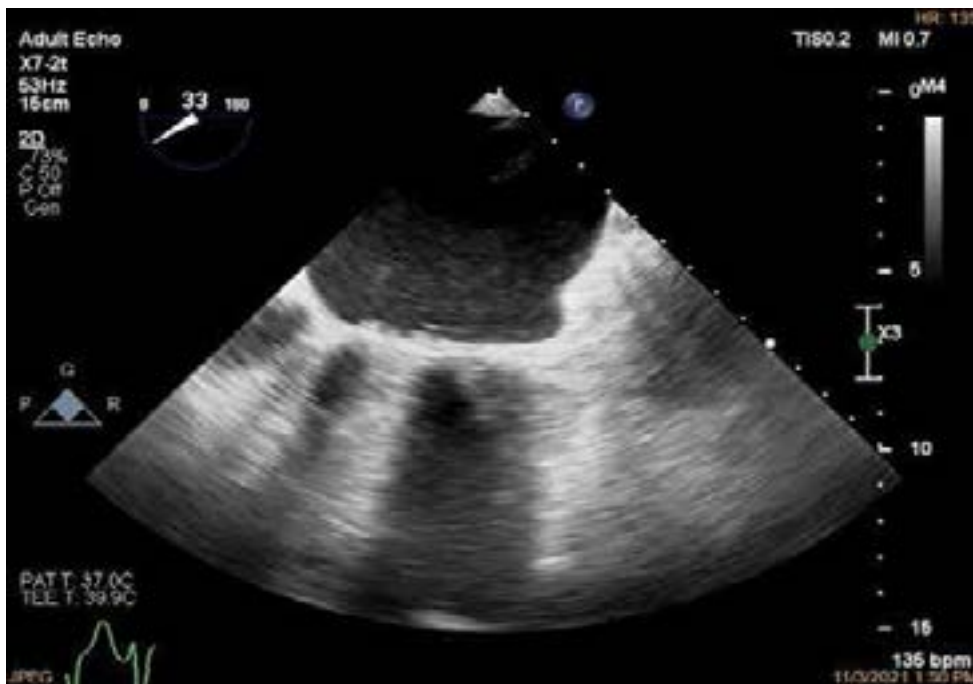


Figure 1. Transesophageal echocardiographic visualization of the thrombus



**Video 1.** A free-floating ball thrombus in left atrium with TEE

<https://www.youtube.com/watch?v=7NVJE7sPXNI>

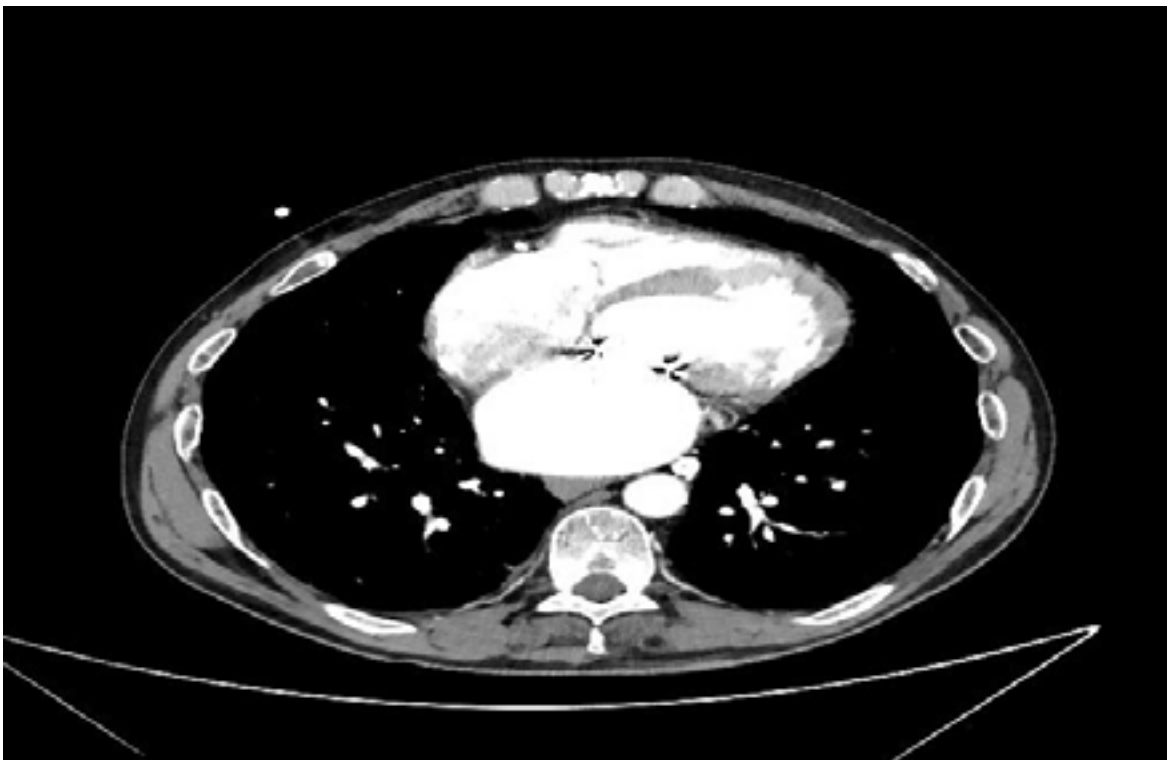


**Video 2.** Spontaneous echo contrast and thrombus appearance in the left atrial appendage with TEE

<https://www.youtube.com/watch?v=macjXFoOglq>



**Figure 2.** The thoracic and abdominal aorta CT angiography showing thrombus in the left atrium



**Figure 3.** After 14 days control: Thoracic aorta CT angiography revealing complete disappearance of the large atrial thrombus in the left atrium

## Discussion

LABT is extremely rare in patients with a mechanical prosthetic mitral valve with INR in the effective range but without valve dysfunction. On the other hand, it has been suggested that left atrial thrombus may occur even after a relatively short interruption of anticoagulant therapy in patients with prosthetic valves [3]. In this case, we considered that the cause of thrombus formation was due to the patient's recent interruption of warfarin therapy.

After diagnosis of free-floating ball thrombus, the recommended treatment method is surgical removal of the thrombus, but thrombolytic and anticoagulation therapy are recommended as alternative treatment methods in high-risk cases with various complications and in patients who refuse surgery. Thrombolytic therapy may represent a viable option for the treatment of LA thrombus to prevent embolization and stroke [5]. However, thrombolytic therapy was not preferred in our case due to the high bleeding tendency and relative contraindications. Our case, which was considered as high risk by surgeons and not suitable for thrombolytic therapy, was treated with anticoagulants. We targeted a similar INR level to the case previously published by Nurra et al. [4], and no hemorrhagic or embolic complications developed.

Another important issue is that if any operation is planned, especially in patients with mechanical prosthetic valves, keeping the warfarin interruption as short as possible and effective bridging treatment without causing bleeding and ischemic complications should be carefully evaluated. A perioperative bridging therapy with a low molecular weight heparin is recommended in patients with mitral valve replacement. During UFH treatment, follow-up with factor 10a level may be required. Anti-Xa activity is a reflection of UFH concentration, but routine application of Anti-Xa testing is currently not evidence-based [6].

In conclusion, we presented a case with left atrial ball thrombus caused infarct formation in the spleen and kidney, whose findings regressed after effective anticoagulation.

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

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**Informed consent:** An informed consent form was obtained from the patient. The case was written after obtaining the patient's consent.

## Authors' contributions to the article

H.A., H.A.K.T. and Y.D. constructed the main idea and hypothesis of the study. H.A., H.A.K.T. and G.S. developed the theory and edited the material and method section. H.A. and H.A.K.T. have done the evaluation of the data in the Results section. Discussion section of the article written by H.A., H.A.K.T., Y.D. and G.S.

H.A., H.A.K.T., Y.D. and G.S. reviewed, corrected and approved. In addition, all authors discussed the entire study and approved the final version.