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# Lupus Anticoagulant Autoantibody Positivity Due to Rivaroxaban: A Case Report

## *Rivaroksabana Bağlı Lupus Antikoagülan Otoantikor Pozitifliği: Olgu Sunumu*

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### Abstract

Pulmonary embolism refers to obstructions of the pulmonary arterial bed due to various etiologies. In most cases, pulmonary embolisms are caused by blood clots that travel to the lungs from the deep veins in the legs or, more rarely, from veins in other parts of the body. Today, the new generation oral anticoagulants are preferred for the treatment of pulmonary embolism due to their ease of use and greater reliability. The new oral anticoagulants are novel direct-acting medications that are selective for a specific coagulation factor, either thrombin or activated factor Xa, among which Rivaroxaban has been used in many countries. Lupus anticoagulant autoantibodies are considered a common culprit in the etiology of pulmonary embolisms with no underlying risk factor, which may lead to false positives in patients using Rivaroxaban. A case with lupus anticoagulant autoantibody positivity due to rivaroxaban usage is presented here to draw attention to this issue.


**Keywords:** *Lupus anticoagulant autoantibodies, Rivaroxaban, Factor Xa inhibitors.*


### Öz

Pulmoner emboli (PE), çeşitli etiyolojilere bağlı olarak pulmoner arter yatağında tıkanma olarak tanımlanır. Çoğu durumda PE bacaklardaki derin venlerden veya nadiren vücudun diğer bölgelerindeki damar pıhtılarından kaynaklanır. Günümüzde yeni nesil oral antikoagülanlar güvenilirlik ve kullanım kolaylığından dolayı tercih edilmektedir. Yeni oral antikoagülanlar trombin veya faktör Xa gibi koagülasyon faktörlerine selektif olup direkt etkili yeni ilaçları temsil eder. Rivaroksaban birçok ülkede kullanılan yeni nesil oral antikoagülanlardan biridir. Rivaroksaban kullanan hastalarda yanlış pozitif olarak sonuçlanabilen lupus antikoagülan antikorları altta yatan risk faktörü olmayan pulmoner embolide ortak bir suçlu olarak kabul edilir. Rivaroksaban kullanımına bağlı lupus antikoagülan otoantikor pozitifliği olan bir olgu konuya dikkat çekmek için sunulmuştur.


**Anahtar Kelimeler:** *Lupus antikoagülan otoantikorları, Rivaroksaban, Faktör Xa inhibitörleri.*

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Pulmonary embolism (PE) is defined as a blockage of the pulmonary artery bed by such matter as thrombi, amniotic fluid, tumors or fat. Risk factors include surgical operations, malignancy and immobility related to the etiology of PE. Clinically, patients may be asymptomatic or life-threatening massive emboli may be observed. Treatment of pulmonary thromboembolism (PTE) is through anticoagulant agents. In recent years a new generation of oral anticoagulants has emerged and preferred has gained popularity due to their ease of use, reliability, the removal of the requirement for laboratory follow-up and safety in terms of their side effect profiles (1). Non-vitamin K antagonist oral anticoagulants are replacing warfarin in many indications, and include dabigatran, which inhibits thrombin, and rivaroxaban, apixaban and edoxaban, which inhibit factor Xa (1). Hereditary thrombophilia screening is essential, especially for young patients with no underlying risk factors in PTE, although there are false positive cases depending on the medications during these scans. One of the antigens that are often looked for in hereditary thrombophilia screening are lupus anticoagulants. The limited data in the literature showed that there are false positive lupus anticoagulant antibodies associated with the use Rivaroxaban usage (2,3).

We present here a case with lupus anticoagulant autoantibody positivity due to rivaroxaban usage to draw attention to the issue. The lupus anticoagulant positivity of the case became negative after Rivaroxaban was discontinued.

## CASE

A 22-year-old male patient diagnosed with organized pneumonia developed femoral head necrosis after undergoing methylprednisolone treatment. Despite receiving primary prophylaxis with low molecular weight heparin after the operation, (LMWH), the patient was admitted to the emergency department with pain and swelling in the right leg, shortness of breath, palpitations and hemoptysis. The patient was a non-smoker with no characteristic personal or family history. The patient's body temperature was 36.5°C, blood pressure was 138/89 mmHg and respiration frequency was 18/min, and Homan's sign was observed in the right leg. An examination of the respiratory system was ordinary, no pathological sounds were heard, and systematic examinations revealed no other abnormalities.

The patient's laboratory results were as follows: D-dimer value 1.61 mg/L (reference range: 0.08–0.583); PLT value 203.000/$\mu$L; coagulation parameters were normal; oxygen saturation was 98% in room air; and pulse was 112/ minute. Thrombus material was observed in the right femoral vein on limb venous Doppler ultrasonography (US) and a filling defect indicating thrombus was observed in the segment branch leading to the upper lobe of the right lung on computed tomography pulmonary angiography (CTPA) (Figure 1). The patient was placed on Bemiparin sodium 10,000 IU and was followed up in our clinic for 7 days before being discharged with a Bemiparin sodium prescription. The patient was prescribed Rivaroxaban in place of Bemiparin 2 months later due to difficulty of use. After the Rivaroxaban treatment, tests for hereditary thrombophilia were performed to investigate the etiology of the embolism. As the patient's lupus anticoagulant autoantibody result was positive and other hereditary thrombophilia parameters were normal, the Rivaroxaban was discontinued and Bemiparin-sodium treatment was restarted. The patient's subsequent lupus anticoagulant results returned to normal after treatment with Bemiparin-sodium for 1 month. Lupus anticoagulant positivity due to the Rivaroxaban treatment was considered in the patient, which is a rarely observed condition in literature.

## DISCUSSION

A pulmonary embolism is an obstruction of the pulmonary artery and its branches by formations such as thrombi, malignant cells, amniotic fluid, fat, etc., and the most common form of PE is venous thromboembolism. Hereditary or acquired traits may lead to embolisms in patients with PTE, and one of the most common hereditary causes is lupus anticoagulant positivity – a subgroup of antiphospholipid antibodies. The classical in vitro definition of lupus anticoagulant antibody is autoantibodies, which prolong the duration of phospholipid-binding coagulation tests. The condition was first described in 1952 as a circulating anticoagulant in the presence of systemic lupus erythematosus (SLE) (4). The term lupus anticoagulant was given in error to this antibody, as the term "lupus" incorrectly gives the impression that the antibody is unique to SLE patients, while the term "anticoagulant" incorrectly suggests an association with a hemorrhagic clinical condition. In fact, lupus anticoagulant can cause acquired thrombophilia or clinical thrombosis rather than bleeding. Only around 20% of SLE patients have lupus anticoagulants, while patients have been reported that have lupus anticoagulant antibodies, but do not have SLE, and that do not develop SLE in a 20-year follow-up (5). Although lupus anticoagulant is defined through in vitro tests, the presence of stable lupus anticoagulants may be an indicator of thrombophilia or thrombosis risk in clinical practice. All lupus anticoagulants are antiphospholipid antibodies, but only a quarter of all antiphospholipid antibodies are lupus anticoagulants (6). The presence of lupus anticoagulants is assessed indirectly, and a series of tests are required for laboratory diagnosis.

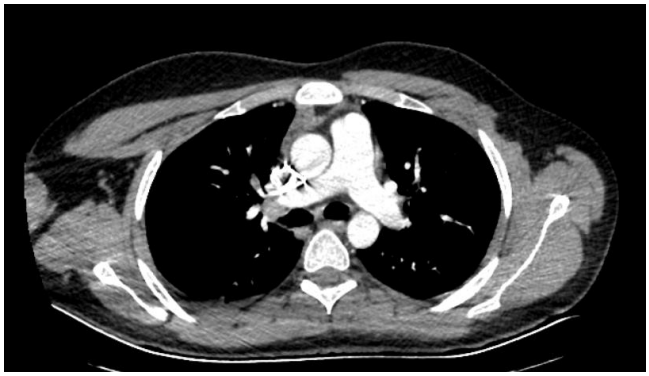

*Figure 1: Thrombus in the right upper lobe pulmonary artery*

LMWH, warfarin or new-generation oral anticoagulants are used to treat PTE. Recent studies conducted by Murer et al. (7) on 59 patients, and Merriman et al. (2) on 60 patients, revealed that Rivaroxaban may lead to false positive results in lupus anticoagulant tests when screening for hereditary thrombophilia, and the EINSTEIN clinical trial outcomes confirmed these findings (8).

A study by Goralczyk et al. (3) revealed that blood samples should be taken at least 24 h after the last dose of Rivaroxaban for the detection of false positive lupus anticoagulant antibodies.

In the case presented here, however, no lupus anticoagulant test was conducted before the patient was started on Rivaroxaban, and the lupus anticoagulant positivity was subsequently found to be associated with the Rivaroxaban treatment. After 1 month of Bemiparin-sodium usage, the lupus anticoagulant test result was negative in the presented case.

There are limited studies in literature reporting the potential for Rivaroxaban to lead to false positive lupus anticoagulant test results, and the case we present here can thus be considered to contribute to literature in this regard.

## CONFLICTS OF INTEREST

None declared.

## AUTHOR CONTRIBUTIONS

Concept - E.B., Ş.A., A.Ş., H.S.Ş., M.O.A.; Planning and Design - E.B., Ş.A., A.Ş., H.S.Ş., M.O.A.; Supervision - E.B., Ş.A., A.Ş., H.S.Ş., M.O.A.; Funding - E.B., Ş.A., A.Ş., H.S.Ş., M.O.A.; Materials - E.B., Ş.A., A.Ş., H.S.Ş., M.O.A.; Data Collection and/or Processing - E.B., Ş.A., A.Ş., H.S.Ş., M.O.A.; Analysis and/or Interpretation - E.B., Ş.A., A.Ş., H.S.Ş., M.O.A.; Literature Review - E.B., Ş.A., A.Ş., H.S.Ş., M.O.A.; Writing - E.B., Ş.A., A.Ş., H.S.Ş., M.O.A.; Critical Review - E.B., Ş.A., A.Ş., H.S.Ş., M.O.A.

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