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Case Report / Olgu Sunumu

A case of rivaroxaban associated spontaneous hemothorax

Rivaroksabana bağlı spontan hemotoraks olgusu

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ABSTRACT

New oral anticoagulants have emerged as an alternative for warfarin for thromboembolic prevention in patients with non-valvular atrial fibrillation. Although new oral anticoagulants have better compliance and safety margin compared to warfarin, we must be cautious with their usage. In this article, we report a case of spontaneous hemothorax related to rivaroxaban treatment. According to our research, this is the first case of spontaneous hemothorax secondary to rivaroxaban treatment.

Keywords: Hemorrhage; rivaroxaban; spontaneous hemothorax.

ÖZ

Valvüler olmayan atriyal fibrilasyonlu hastalarda tromboembolik korunma için varfarine alternatif olarak yeni oral antikoagülanlar ortaya çıkmıştır. Yeni oral antikoagülanlar varfarine göre daha iyi uyum ve güvenlik marjına sahip olmakla birlikte, kullanımları konusunda dikkatli olmalıyız. Bu yazıda, rivaroksaban tedavisine bağlı bir spontan hemotoraks olgusu sunuldu. Araştırmamıza göre, rivaroksaban tedavisine sekonder ilk spontan hemotoraks olgusu budur.

Anahtar sözcükler: Hemoraji; rivaroksaban; spontan hemotoraks.

Hemothorax is defined as a pleural fluid with hematocrit greater than 50% of the patient's blood, although in cases of long standing hemothorax due to hemodilution, hematocrit level can be lower.[1] The most common cause of hemothorax is chest trauma. Causes of non-traumatic hemothorax include malignancies, anticoagulant medications, vascular anomalies, pulmonary infarctions and hematologic abnormalities.[2,3]

Due to warfarin having multiple drug and food interactions and frequent monitoring requirement, new oral anticoagulants (NOACs) were developed to eliminate the need for monitoring the international normalized ratio (INR). The Rivaroxaban Once Daily Oral Direct Factor Xa Inhibition Compared with Vitamin K Antagonism for Prevention of Stroke and Embolism Trial in Atrial Fibrillation trial showed that NOAC (rivaroxaban) was noninferior to warfarin in the prevention of subsequent stroke or systemic embolism and there were no significant differences in rates of major or clinically relevant nonmajor bleeding between the two study groups, although intracranial and fatal bleeding occurred less frequently in the rivaroxaban group.[4]

In this article, we report a case of spontaneous hemothorax (SH) related to rivaroxaban treatment. To the best of our knowledge, SH secondary to rivaroxaban treatment has not been reported in the literature.

CASE REPORT

A 63-year-old female patient with a past medical history of atrial fibrillation (AF), diabetes mellitus, and hypertension treated with rivaroxaban presented to emergency department (ED) with chest pain and dyspnea. The patient had no history of smoking, pre-existing lung disease, tumor or trauma. Her blood pressure was 120/80 mmHg, pulse rate was 120 beats per minute and irregular, oxygen saturation was 97% with oxygen. Pulmonary auscultation revealed reduced breath sounds in the right hemithorax.

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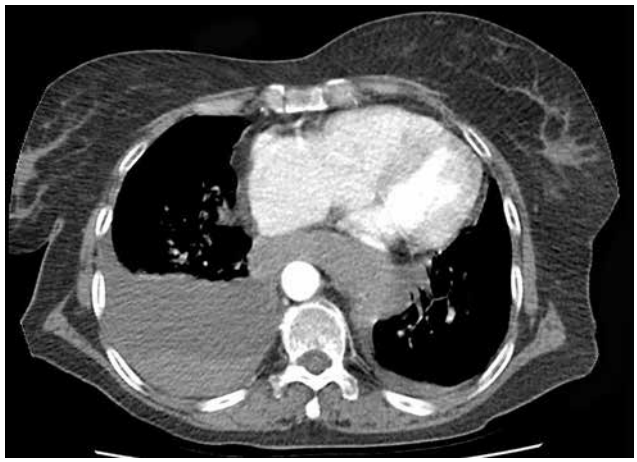

Figure 1. Computed tomography of chest reveals a right side pleural effusion and mediastinal hematoma.

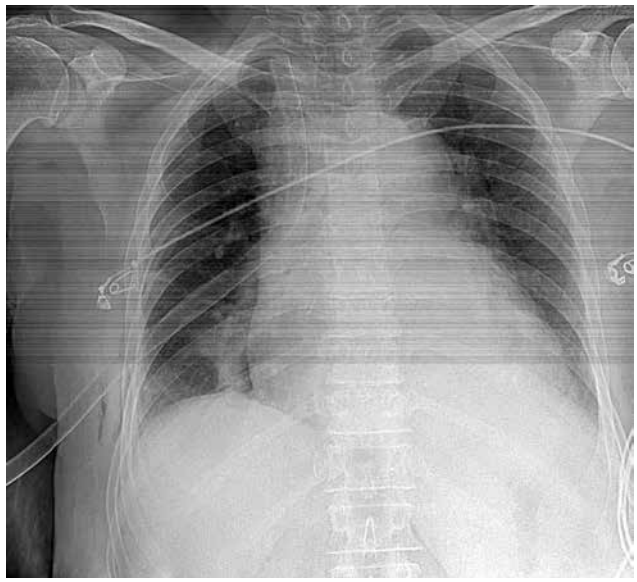

Figure 2. Chest X-ray after tube thoracostomy.

A written informed consent was obtained from the patient.

Chest X-ray suggested right side pleural effusion. Echocardiography revealed an ejection fraction of 55%. A diagnostic thoracentesis revealed bloody fluid in the thoracic cavity. Computed tomography of the chest showed a right side pleural effusion along with mediastinal hematoma (Figure 1).

Laboratory results revealed white blood cells 8.84 billion/L, hemoglobin 9.8 g/dL, hematocrit 30.7%, platelet 158 billion/L, sodium 139 mmol/L, potassium 4.2 mmol/L, aspartate aminotransferase 10.2 U/L, alanine aminotransferase 7.7 U/L, blood urea nitrogen 26 mg/dL, creatinine 0.9 mg/dL, prothrombin time (PT) 15.1 seconds, international normalized ratio (INR) 1.21, activated partial thromboplastin time (APTT) 26.1 seconds.

Pleural fluid hematocrit was 17.3%; greater than 50% of the patient's blood hematocrit. Right hemithorax tube thoracostomy was applied to the patient (Figures 2 and 3). There was 600 cc hemorrhagic fluid drainage. The patient's hemoglobin decreased from 9.8 to 6.8 g/dL and the patient received a three-unit blood transfusion. The chest tube was removed six days later and there was approximately 1550 mL hemorrhagic fluid drainage from the chest tube. The patient was discharged on

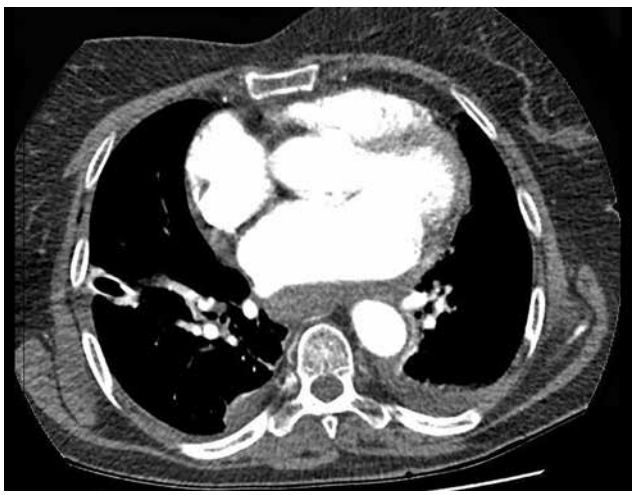

Figure 3. Computed tomography of chest reveals a right side pleural effusion and mediastinal hematoma.

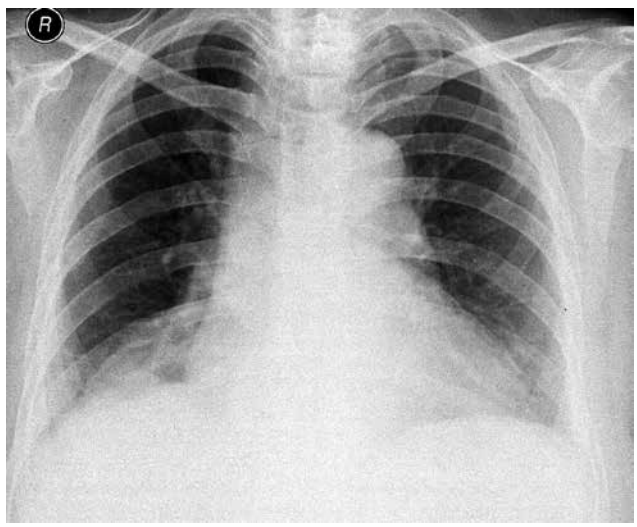

Figure 4. Chest X-ray one month later.

the seventh day without complication. One month later, there was no symptom or sign of pleural effusion (Figure 4).

DISCUSSION

Spontaneous hemothorax is a rare occurrence in clinical practice. Spontaneous hemothorax is the accumulation of blood within the pleural space in the absence of any obvious trauma.

Rivaroxaban has been approved by the United States Food and Drug Administration as a new orally administered anticoagulant prescribed for systemic embolism prophylaxis in patients with non-valvular AF. Rivaroxaban inhibits factor Xa activity.

The degree of anticoagulant activity of rivaroxaban cannot be assessed by the traditional coagulation studies.[5] But in overdose situations, rivaroxaban increases INR. Rivaroxaban plasma concentrations and PT correlates with a linear model.[6] Activated partial thromboplastin time prolongation also occurs in dose-dependent fashion.[7] Our patient's coagulation panel being within normal limit showed that the SH was most likely related to therapeutic dosing.

Bleeding events are the most frequent adverse reactions related to oral anticoagulants. Administration of anticoagulant therapy can cause hemothorax as a result of minimal trauma in the chest or spontaneous rupture of small vessels. Spontaneous hemothorax following anticoagulation with an old oral anticoagulant (warfarin) has been reported.[8,9] Rivaroxaban is a NOAC that has safety margin more favorable than warfarin. To our knowledge, SH secondary to a NOAC (rivaroxaban) treatment has not been reported in the literature yet. In our case, the development of SH in the absence of other factors suggested that the use of rivaroxaban could be a triggering factor for hemothorax.

Bleeding event rates are higher in patients over the age of 65 than in those under the age of 65. In decreased creatinine clearance (CrCl) patients, the risk of bleeding is elevated since drug exposure is increased.[10] Rivaroxaban is also contraindicated in patients with hepatic disease associated with coagulopathy.[11] The recommended dose of rivaroxaban per package insert is 20 mg once daily for CrCl >50 mL/min, and 15 mg once daily for patients with CrCl 15 to 50 mL/min. Our patient was 63-years-old with no hepatic disease. Although her CrCl was 65.7 mL/min, she had been prescribed 15 mg rivaroxaban once daily prior to the ED presentation.

This case underscores that rivaroxaban may cause spontaneous hemothorax. If pleural fluid develops in patients receiving rivaroxaban therapy, spontaneous hemothorax should be considered in the differential diagnosis.

Declaration of conflicting interests

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