



Case Report / Olgu Sunumu

A successful surgical treatment of pulmonary thromboembolism after endovenous radiofrequency ablation with extracorporeal membrane oxygenation bridging

Endovenöz radyofrekans ablasyon sonrası ekstrakorporeal membran oksijenasyon köprülemesi ile pulmoner tromboembolinin başarılı tedavisi

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ABSTRACT

Pulmonary embolism after endovenous radiofrequency ablation is very rare, but a clinically severe complication. Herein, we report a case of pulmonary embolism after endovenous radiofrequency ablation. Early after radiofrequency ablation pulmonary embolism developed and extracorporeal membrane oxygenation implantation was performed. Under extracorporeal membrane oxygenation support, surgical pulmonary embolectomy was performed successfully using the same cannulas and the patient was discharged without any neurological sequelae. In conclusion, although rare after radiofrequency ablation, early recognition of pulmonary embolism and prompt treatment can be life-saving.

Keywords: Endovenous radiofrequency ablation, extracorporeal membrane oxygenation, pulmonary embolism.

Endovenous radiofrequency ablation (RFA) has been used as a less invasive alternative to stripping and ligation in chronic venous insufficiency for nearly two decades. Patients experience better cosmetic results with less pain and rapid recovery.^[1] Although this treatment has many advantages compared to conservative treatment, some complications can be seen such as skin burns, skin discoloration, neurotic sequelae, deep vein thrombosis (DVT) and, very rarely, pulmonary embolism (PE).^[2] On the other hand, there is no consensus on the treatment of massive pulmonary thromboembolism (PTE) in critically ill patients.

ÖZ

Endovenöz radyofrekans ablasyonu sonrası pulmoner emboli çok nadir, fakat klinik olarak ciddi bir komplikasyondur. Bu yazıda, endovenöz radyofrekans ablasyonu sonrası pulmoner emboli gelişen bir olgu sunuldu. Radyofrekans ablasyonundan hemen sonra pulmoner emboli gelişmesi üzerine, ekstrakorporeal membran oksijenasyon implantasyonu gerçekleştirildi. Ekstrakorporeal membran oksijenasyon desteği sırasında, cerrahi pulmoner embolektomi aynı kanüller kullanılarak başarıyla gerçekleştirildi ve hasta herhangi bir nörolojik sekel olmadan taburcu edildi. Sonuç olarak, radyofrekans ablasyonu sonrasında nadir görülse de, pulmoner embolinin erken tanısı ve hızlı bir şekilde tedavisi hayat kurtarıcı olabilir.

Anahtar sözcükler: Endovenöz radyofrekans ablasyon, ekstrakorporeal membran oksijenasyonu, pulmoner emboli.

In this article, we report a case of clinically severe PE following RFA surgically treated with extracorporeal membrane oxygenation (ECMO).

CASE REPORT

A 40-year-old woman presented with dilated left lower limb veins to the vascular surgery clinic. Her pregnancies and deliveries were uneventful. She had no history of contraceptives or hormone replacement therapy, coagulopathy, smoking or alcohol consumption. Her body mass index was 25.2 kg/m². Doppler ultrasound showed that left great saphenous

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vein (GSV) reflux with saphenofemoral junction (SFJ) incompetence and no evidence for DVT. Echocardiographic findings were in normal ranges according to age and sex. The patient underwent RFA for the left GSV under spinal anesthesia. Routinely, the RFA catheter was pushed forward 2-cm away from the SFJ under local tumescent and ablation was performed. Postoperative Doppler ultrasound confirmed a complete closure of the varicose vein courses with no evidence of local thrombus or DVT. The patient was transferred to the ward with the advice of compression bandage, intravenous antibiotics, and analgesics. She began to walk eight hours after the operation. There was no hematoma, swelling or warming of the skin of the leg. At 12 hours, she fell suddenly, while walking and became unconscious. Her pulse was non-palpable and apnea was seen. Immediately, cardiopulmonary resuscitation (CPR) was initiated. Approximately 30 min later, there was no heart rhythm and pulse. The arterial blood gas analysis results were as follows: partial pressure of oxygen (pO_2): 69 mmHg, oxygen saturation (sO_2): 69%, partial pressure of carbon dioxide (pCO_2): 52 mmHg, pH: 6.82, lactate: 23 mmol/L, and base excess:-22.8 mmol/L. Extracorporeal membrane oxygenator was percutaneously implanted via the

right common femoral vein and left common femoral artery with an antegrade perfusion catheter. Using the ECMO, pulse and rhythm were seen and, one hour later, blood gas parameters started to improve. Computed tomography (CT) angiography confirmed PE due to an acute thrombus visualized in the entire lumen of right main pulmonary artery and the partial portion of the left lower lobe segmental artery, and mosaic pattern of perfusion, particularly in the left lung, but no pulmonary infarction (Figure 1). On cranial CT, there was no acute ischemia or bleeding. Bedside Doppler ultrasound revealed no thrombus in the lower limb veins. Consciousness was achieved within one hour after perfusion. Heparin was initiated. Due to the ECMO implantation, hemodynamic instability, and high thrombus burden, tissue plasminogen activator infusion and other catheter-assisted pulmonary embolectomy interventions were unable to be performed and pulmonary embolectomy was decided. A written informed consent was obtained from the patient. She was operated under moderate hypothermic cardiopulmonary bypass (CPB). There was a thrombus in the right main pulmonary artery and left lower segment artery. She was smoothly weaned from CPB and was transferred to the intensive care unit. She was fully recovered from the effect of anesthesia 4 h later and was extubated on the first postoperative day. A vitamin K antagonist (warfarin) agent was started. There was no increased pulmonary artery pressure on postoperative transthoracic echocardiography. The patient was uneventfully discharged on postoperative Day 10.

DISCUSSION

Although RFA is a safe method for chronic venous insufficiency, PE following RFA treatment can be seen in up to 0.3% of patients. Mortality rate is about 2% among PE cases.^[3] Patient-related factors such as pre-procedural history of DVT, obesity, immobility, and the use of hormonal therapy can be associated with post-procedural venous thromboembolism and PE.^[4] These factors should be, therefore, identified and appropriately managed during the varicose vein intervention. Particular precautions to reduce DVT and PE include positioning the ablation catheter from an appropriate distance from the saphenofemoral and saphenopopliteal junction, anticoagulation prophylaxis, early ambulation, and compression stockings.^[5]

In a meta-analysis including 8,223 patients, only three patients had PE and none of them was life-threatening.^[6] However, O'Donnell et al.^[7] investigated

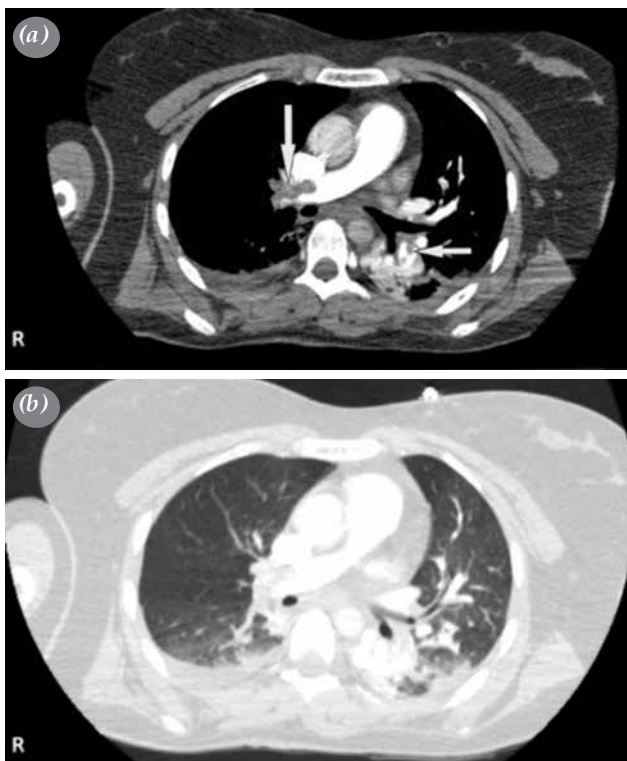


Figure 1. (a) Acute thrombus seen in the entire lumen of right main pulmonary artery and partial portion of left lower lobe segmental artery. (b) Mosaic pattern of perfusion in left lung.

thrombotic complications in varicose vein treatment in a real-world setting and concluded that the number of PE could be underestimated than those reported in clinical trials.

A total of 5 to 10% of all PE cases after varicose vein surgery have an unstable hemodynamic condition, leading to shock and these patients have a 15 to 60%-times higher mortality rate, compared to those with a stable condition.^[8] According to the guidelines, in patients with suspected PE presenting with shock or hypotension, if CT angiography reveals positive PE imaging, thrombolysis, surgical embolectomy or catheter-directed treatment modalities can be performed.^[9] Moreover, ECMO bridging and pulmonary embolectomy can be life-saving interventions in high-risk PE cases.^[10] With the use of CPR and ECMO, thrombolysis can induce bleeding and worsen the clinical situation. In more stable patients, thrombolysis is an effective method to lyse the thrombus in the pulmonary artery with improved clinical status in varicose vein surgery.^[11] However, in the literature, such patients were discharged from hospital after the operation and PE usually developed between the postoperative second and fifth days during the home rest. In our case, PE developed very early, 12 h after the operation.

In conclusion, early recognition of deep vein thrombosis and pulmonary embolism and prompt treatment can be life-saving and reduce potential death events. In addition, all sorts of venous interventions should be performed in or in close of the cardiovascular centers, including non-invasive lab procedures.

Declaration of conflicting interests

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