Pulmonary Embolism following Radiofrequency Ablation for Varicose Vein Treated with Thrombolytic Therapy: A Case Report and Review of Literature

Palanisamy Jayakumar, Chairman Saravanan Robinson¹, Dhevendran Maruthupandian, Rajagopal Ganesh²
Departments of General Surgery and ¹Vascular Surgery, Government Rajaji Hospital, Madurai Medical College, ²Department of Radiology, Meenakshi Mission Hospital and Research Center, Madurai, Tamil Nadu, India

Abstract

Radiofrequency ablation (RFA) for varicose vein may have life-threatening complications such as deep vein thrombosis and pulmonary embolism (PE). Here, we reported a case report of PE following RFA, which required thrombolysis to save the patient.

Keywords: Deep vein thrombosis, pulmonary embolism, radiofrequency ablation, thrombolysis

Introduction

Varicose vein is a common clinical condition affecting lower legs with the prevalence of 10%–25% of the general population. Clinical manifestations are varicosities, vague leg pain, nonhealing ulcer, edema, fatigue, and skin discoloration. Treatment modalities include invasive one like great saphenous vein (GSV) ligation with stripping and the less invasive procedures such as endovenous ablation (EVA) procedures like radiofrequency ablation (RFA), endovenous laser therapy (EVLT) and sclerotherapy.[1]

Even though the EVT reduces the morbidity and favors in early return to work, it may result in complications such as skin burns, skin discoloration, neuritic sequelae, deep vein thrombosis (DVT), and pulmonary embolism (PE).[2]

Here, we report a case of PE following RFA for varicose vein among 2300 RFAs done by a single surgeon during the period of 2007–2016.

Case Report

A 48-year-old female patient with complaints of dilated left lower limb veins for 10-year duration with vague dragging pain of the same limb for 1 month admitted for further management. She was a known hypertensive and hypothyroid status on treatment with normotensive and euthyroid status, with the body mass index of 27.5 kg/m². Her Doppler study of the left lower limb confirms the GSV, short saphenous vein (SSV) reflux with saphenofemoral junction (SFJ) incompetence, and there is no evidence for DVT. The patient was further evaluated for anesthesia assessment. Her routine investigations and cardiac status were normal. RFA of the left varicose vein (GSV and SSV) was done under local tumescent. As routine, we used to park the RFA catheter 2 cm away from SFJ which was followed in this patient also.

Postoperative Doppler study confirmed complete closure of the varicose vein course, and there was no evidence of thrombus or DVT. Anticoagulation prophylaxis was given low molecular weight heparin for 3 days. The patient was discharged on the third postoperative day (POD) with the advice of compression stocking, mobilization, oral antibiotics and analgesics. Even though we discharge patients early with maximum admission period of 1 day, she was hospitalized for 3 days at the request of the patient and her daughter who is a doctor. However, she was actively mobilized in the hospital by staffs.

Address for correspondence: Dr. Palanisamy Jayakumar,
E-mail: drjayakumar1999@gmail.com

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Due to pain, the patient restricted her mobility at home, on fifth POD, patient fainted at her home with sweating, tachypnea, edematous left leg, and feeble pulse with rate of 130/min in the early morning. She was started on intravenous fluid resuscitation and shifted to the hospital. In the Emergency Department, her systolic blood pressure (BP) was 60 mmHg, without the recordable diastolic BP and her echocardiogram identified right atrial and ventricular dilatation with mild pulmonary hypertension. X-ray chest corresponded with cardiomegaly. She was started on dopamine and nasal oxygen support. Her surgical history and other clinical features favor the diagnosis of PE, which was further evaluated by computed tomography angiography (CT angiogram) of the chest. CT angiogram confirmed the PE due to acute thrombus seen in the entire lumen of both right and left pulmonary arteries [Figure 1] and its lobar and segmental branches without any pulmonary infarct, but with mild mosaic pattern of perfusion in both lung fields [Figure 2] and mild cardiomegaly with dilated right atrium and ventricle [Figure 3]. Thrombolysis of the PE done using injection tenecteplase 40 mg. Patient’s general condition improved within the next 2 h. Postthrombolysis Doppler could not make out any thrombus in both lower limbs. The source of PE was most probably from the RFA site. Dopamine support weaned in the next 8 h with a normal BP of 130/90 mmHg. All her coagulation profiles were normal and no evidence of prothrombotic factors. Patient discharged on the 5th day of postthrombolysis. She was maintained on anticoagulation for the last 6 months without any evidence of recanalization of the GSV, SSV, or SFJ.

The surgeon also experienced two DVT cases; in one case, it involving common femoral vein (CFV), superficial femoral vein, and popliteal vein (PV). Another case involving only CFV.

This case report is the only case report of PE following RFA that required thrombolysis, but without the evidence of DVT postoperatively.

**Discussion**

Incidence of PE following varicose vein treatment procedures was 0.3% each for RFA, surgery, and laser ablation; and for sclerotherapy, 0.2%, but manufacturer and user facility device experience database shows high number of complications following RFA (61.9%) compared to EVLT (38.1%) and 2% death due to PE in periprocedure period.

Presentation of PE may include chest pain, dyspnea, blood-tinged sputum, and symptoms of thrombophlebitis or DVT. Veins identified as a source of PE in a study are saphenous vein in two cases and gastrocnemius vein thrombosis extending into the PV in the third case. Two cases were treated with anticoagulation, and other one declined anticoagulation, but none required thrombolysis.

The incidence of DVT and PE were similar between EVLT and RFA. The incidence of DVT is increased 2.4 times in patients presenting with lower limb venous ulcers. Precautions suggested to reduce DVT and PE are positioning the ablation catheter from an appropriate distance from saphenofemoral and saphenopopliteal junction, anticoagulation prophylaxis,
early ambulation, and compression stockings. Another study suggested DVT prophylaxis in patients aged more than 50 years.\cite{6,7}

Bigger sized proximal GSV, which may be a factor implicated as potential risk factor for DVT and PE following EVA by some surgeons. Furthermore, some surgeons want to ligate the proximal GSV for the same reason. However, a study disproved both the statements, neither GSV ligation nor the size of GSV influences the PE and DVT.\cite{8}

Early postoperative duplex scan is recommended to find out the DVT and for early initiation of the treatment to avoid PE.\cite{6-9}

In our case, even though the postoperative duplex scan did not find any venous thrombus, the patient most probably develops DVT and PE due to less ambulation at home after discharge.

**Conclusion**

PE is a life-threatening complication following EVA, so even after DVT prophylaxis, early ambulation, and early discharge, patients should be kept adequately pain free and encourage their routine work to avoid such complications.

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**Conflicts of interest**

There are no conflicts of interest.

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