

Case Report

A Case of Acute Pulmonary Embolism after Catheter Radiofrequency Ablation of Paroxysmal Supraventricular Tachycardia

Fu T^{1*}, Zhang X^{2*}, Chen Y², Lou L² and Yang J^{2*}¹Department of Cardiology, Yiwu Central hospital, China²Department of Cardiology, The First Affiliated Hospital, College of Medicine, Zhejiang University, Hangzhou, China

*Contributed Equally to This work

***Corresponding author:** Jian Yang, Department of Cardiology, The First Affiliated Hospital, College of Medicine, Zhejiang University, No.79, Qing-Chun Road, Hangzhou, Zhejiang, 310003, China**Received:** December 21, 2021; **Accepted:** January 21, 2022; **Published:** January 28, 2022**Abstract**

Radiofrequency ablation is an effective method to treat paroxysmal supraventricular tachycardia. In this article, we report a case of pulmonary embolism and death after ablation of paroxysmal supraventricular tachycardia. The patient did not have other diseases, nor did he have any risk factors for embolism. A summary of the literature found that despite the low incidence, radiofrequency ablation for paroxysmal supraventricular tachycardia is still associated with the risk of pulmonary embolism. At present, there is no clear guidance for the perioperative anticoagulation treatment of such patients. It is necessary to investigate this issue in depth in the future.

Keywords: Ablation; Paroxysmal supraventricular tachycardia; Pulmonary embolism**Case Presentation**

A 55-years-old woman was admitted to the hospital with paroxysmal supraventricular tachycardia and planned to undergo catheter radiofrequency ablation. The patient has a good previous health condition and has no other comorbidities.

After perfecting the preoperative examination (no abnormalities in all examinations), the radiofrequency ablation was performed under local anesthesia. Electrodes were placed in the coronary sinus, His bundle, and right ventricle through the left femoral vein and right subclavian vein. Electrophysiological examination revealed right sided supraventricular tachycardia. Insert the ablation lead through the right femoral vein, find the atrioventricular fusion target at 6 o'clock in the right tricuspid annulus, use temperature control at 50 degrees, 40W discharge. After 10 seconds, the Delta wave disappeared. Continue to discharge for 180 seconds under the same conditions. After ablation, observation was carried out for 20 minutes, during which no Delta wave was seen on the electrocardiogram of the body surface and no supraventricular tachycardia was induced. The ablation was successful.

On the afternoon of the first postoperative day, the patient had sudden syncope, cardiac arrest, cyanosis of the lips, clammy limbs, and 60% oxygen saturation of the fingertips on his way to the ultrasound examination. Perform cardiopulmonary resuscitation immediately. The patient's heart rate recovered, showing atrial fibrillation heart rate, but still no response. Emergency administration of norepinephrine to maintain blood pressure and volume expansion.

After returning to the ward, an emergency bedside transthoracic echocardiography (TTE) was performed (the image was not be saved). The TTE examination revealed massive thrombosis in the right atrium, and no thrombus was seen in the right ventricle and the pulmonary artery. Therefore, it is considered that the patients had an acute large-area pulmonary embolism.

The results of blood gas analysis showed that the blood pH value was 6.95, the partial pressure of carbon dioxide was 87.6 mmHg, and the partial pressure of oxygen was 19.1mmHg, indicating that type II respiratory failure and metabolic acidosis occurred.

Immediately dissolve 400,000 units of urokinase in 50ml normal saline, and perform thrombolytic therapy with 5ml/h injection. Assisted ventilation with tracheal intubation, intravenous infusion of sodium bicarbonate to correct acidosis.

After a series of rescue measures, the patient still loses consciousness, the blood pressure is still low under the maintenance of a large amount of norepinephrine, and the oxygen saturation is 75% to 84%. Therefore, the patient was transferred to Intensive Care Unit with Extracorporeal Membrane Oxygenation implantation. After Extracorporeal Membrane Oxygenation implantation, the patient's oxygen saturation improved.

However, that night, the patient suffered from gastrointestinal hemorrhage due to the use of thrombolytic therapy. Hemoglobin dropped to 3.4g/dL, and blood potassium was 8.38mmol/L. Circulatory failure rapidly and progressively worsened, lactic acid progressively increased, shock was difficult to correct, and death was pronounced in the early morning of the next day.

Discussion

Catheter radiofrequency ablation is an important method for the treatment of paroxysmal supraventricular tachycardia, and its safety and effectiveness have been fully demonstrated [1]. We reported a case of acute pulmonary embolism and death after paroxysmal supraventricular tachycardia ablation. This patient had no other risk factors for embolic events.

Pulmonary embolism after ablation of paroxysmal supraventricular tachycardia was rarely reported. In 2017, there was a report of a 36-year-old man experiencing dyspnea 1 month

after ablation of supraventricular tachycardia, and progressively worsening. He went to the doctor 5 months after ablation. TTE showed pulmonary artery thrombosis [2]. In another observational study, the researchers analyzed 2386 patients who underwent ablation for supraventricular tachycardia or idiopathic ventricular arrhythmia, and found that 4 cases (0.16%) of middle-aged women (43-52 years old) occurred acute massive pulmonary embolism [3].

Combined with above reports, although the incidence is low, the risk of embolism after supraventricular tachycardia ablation still exists. A meta-analysis published in 2017 explored the incidence of deep vein thrombosis or pulmonary embolism after femoral vein cannulation electrophysiological operation. The 16 studies included in the analysis showed that the incidence of deep vein thrombosis after atrial fibrillation was 0.33%, and the deep vein thrombosis after non-atrial fibrillation was 2.38%. Pulmonary embolism after atrial fibrillation is 0.29%, while non-atrial fibrillation is 0-1.67% [4]. These results are not difficult to understand. Patients with atrial fibrillation often take oral anticoagulants for a long time, thus reducing the incidence of embolic events. While for patients with supraventricular tachycardia, oral anticoagulation is usually not accepted.

Asymptomatic femoral vein thrombosis occurs in 5% of electrophysiological procedures and right-heart radiofrequency ablation, especially when the large sheath is inserted for a long time [5]. At the moment, there seems to be a lack of standardized anticoagulation guidance for these situations, and the role of anticoagulation in this situation deserves further evaluation.

References

1. Calkins H. The 2019 ESC Guidelines for the management of patients with supraventricular tachycardia. *Eur Heart J*. 2019; 40: 3812-3813.
2. Bachani N, Panicker GK, Vichare S, Lokhandwala Y. Subacute massive pulmonary thromboembolism: a rare delayed complication after radiofrequency ablation. *JACC Cardiovasc Interv*. 2017; 10: 2006-2008.
3. Li YC, Lin J, Wu L, Li J, Chen P, Guang XQ. Clinical features of acute massive pulmonary embolism complicated by radiofrequency ablation: an observational study. *Medicine (Baltimore)*. 2015; 94: e1711.
4. Burstein B, Barbosa RS, Kalfon E, Joze J, Bernier M, Essebag V. Venous thrombosis after electrophysiology procedures: a systematic review. *Chest*. 2017; 152: 574-586.
5. Moubarak G, Bonhomme S, Vedrenne G, Bouleti C, Ollitrault J, Priollet P, et al. Femoral vein thrombosis after right-sided electrophysiological procedures. *J Interv Card Electrophysiol*. 2013; 38: 155-158.