

Pulmonary Embolism Associated with Free-Floating Right Heart Thrombus Treated Surgically Directly After Symptom Onset

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Abstract

We present a case of patient who was affected with pulmonary embolism (PE) associated with free-floating thrombotic mass in the right heart chambers. She was planned to undergo heart valve surgery and presented with the symptoms now of introducing of the anesthesia. The emergency operation was performed successfully.

Keywords: Free-floating right heart thrombus; Pulmonary embolism

Introduction

Free-floating right heart thrombi (FFRHT) are a rare form of the venous thromboembolic disease with thrombotic material being in transit from legs or pelvis to main pulmonary artery. They can at any moment develop into the acute pulmonary embolism (APE) and are associated with poor outcome [1]. One-third of patients with deep venous thrombosis can present with pulmonary embolisms and have a mortality of approximately 12% [2]. Appearance of FFRHT in structurally normal Heart is unusual.

Because of the presence of cardiogenic shock in severe cases, early diagnosis is crucial to introduce the adequate therapy. It is seldom possible to manage this condition during the early phase. We describe a patient, who developed APE on the operating table, while introducing the general anesthesia. She was diagnosed with transesophageal echocardiography and the emergency embolectomy could be carried out immediately.

Case Report

A 79-year-old woman was admitted to our hospital due to aortic valve stenosis and mitral valve insufficiency for the elective valve surgery. She presented with chronic heart failure NYHA III. The patient had no coagulation abnormalities in her medical history. The thrombocyte count was 169/nl, international normalized ratio and activated prothrombin time were normal. Because of the non-relevant coronary artery disease. She received ASA 100 mg once a day. Preoperative chest x-ray did not show any pathological findings. There were no clinical signs of DVT at the time of surgery and in the past. The patient was in sinus rhythmus, there were no atrial fibrillation in her medical history and she received preoperatively heparin in profilactic dosis.

After uncomplicated introducing of the anaesthesia the patient presented with acute hypotension. Because of the heart rate over 100 beats per minute, which occurred directly after the begin of anaesthesia and with the APE as the most probably diagnosis she received 4.5 points in Wells' criteria for pulmonary embolism, which placed her in the category of moderate risk. She could be also described with the Geneva Score as moderate risk patient because of the age >65 years and heart rate >100 beats per minute. With transoesophageal echocardiography, we could visualize the massive free-floating mass that came through the right atrium and tricuspid valve into the right ventricle (Figure 1). This finding together with dilated right ventricle and hemodynamic instability made the diagnosis of pulmonary embolism possible. After the emergency sternotomy, the akinetic and ballooned right ventricle indicating a right heart insufficiency was shown up. The patient was cooled down to 26°C with cardiopulmonary bypass and the pulmonary embolectomy was performed using right atrial and pulmonary trunk

approach. A 15 cm long embolus was removed from the right heart chambers and main pulmonary artery (Figure 2). The operation was completed with aortic valve replacement and mitral valve reconstruction. The postoperative therapy included supportive inotropic agents with milrinone and Dobutamin and nitric oxide ventilation. The series of echocardiographic assessment showed an improvement of the right ventricular function. Furthermore because of a temporary acute kidney insufficiency we had to complete the postoperative treatment with hemofiltration for 3 days. In the postoperative course the ultrasound examination of the venous system was performed and there were no signs of DVT. A heparin-induced-thrombocytopenia could not have been confirmed. *The patient was discharged from the intensive care unit at the 7th postoperative day.*

Discussion

Primary reperfusion treatment is in high-risk patients with acute pulmonary embolism and in selected ones of moderate-risk the strategy of choice. No randomized studies concerning FFRHT group are available. The therapeutic decision is in such cases often difficult and should be based on the clinical symptomatic and experience of the medical centre. Patients with FFRHT but without hemodynamic instability are in high risk for APE and in such cases one of the possible treatment methods must be selected and used. In this case the embolectomy was a treatment of choice because of hypotension and indication to heart surgery from another reason, although there are alternatives. The percutaneous catheter directed treatment can be administered in cases of FFRHT but the availability of experienced centres is a limitation of this method. When thromboembolic material is situated only in the right-sided heart chambers, thrombolytic therapy can be successfully applied [3,4]. Patients with additional risk factors, for example these with embolus trapped in patent foramen ovale (PFO) require surgical treatment [5]. The operation is also a good option when contraindications to thrombolysis occur. In some severe cases, mechanical cardiac support is postoperative necessary to maintain the function of the right ventricle. All high-risk patients

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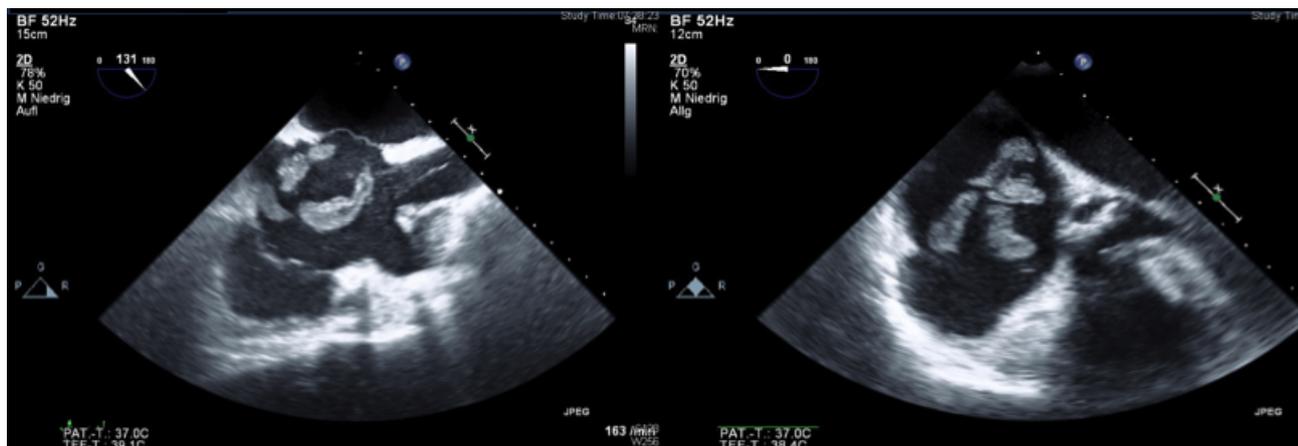


Figure 1: Free-floating right heart thrombus.



Figure 2: Removed embolic material.

without contraindications should be discharged from hospital with oral anticoagulation to prevent PE-episodes in future. [4].

Conclusion

Intra-operative formation of Free-floating thrombus in right heart FFRHT is rare and potentially fatal condition with high

mortality rate and needs emergency diagnosis and therapy. Because of direct accessibility we emphasize the importance of transesophageal echocardiography. Optimal Therapy is mostly discussed. On the basis of reported cases associated with FFRHT the surgical treatment has the best outcomes as far as there is no contraindication.

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