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A rare pathology of syncope: A dilemma for hypertrophic cardiomyopathy or right atrial huge thrombosis

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The authors stated that the written consent was obtained from the patients presented with images in the study.

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Abstract

The complications associated with central venous catheters for hemodialysis access are well known. A rare complication is the development of right-sided intracardiac thrombus, which typically occurs in the right atrium. The location of the permanent catheter tip is associated with the development of thrombi. In this case report, we describe a patient with hypertrophic cardiomyopathy diagnosed with chronic kidney failure 2 years before contrast examination. The patient presented syncope during his last routine hemodialysis, and echocardiography imaging showed a hyperechogenic mass at the tip of the catheter.

Keywords: Syncope, Hypertrophic cardiomyopathy, Thrombus

Introduction

The complications associated with central venous catheters (CVCs) for hemodialysis access are well known. A rare complication is the development of right-sided intracardiac thrombus, especially in the right atrium [1]. The location of the permanent catheter tip is associated with the development of thrombi. According to Hickman et al. [2], the optimal location for the catheter tip is at the junction of the superior vena cava and right atrium but not within the atrium itself.

Catheter-related right atrial thrombus (CRAT) is often asymptomatic, and hence the true incidence is unknown, though it has been reported as anywhere from 5.4% to 46.2% [3]. CRAT is a rare complication of dialysis catheter placement that can lead to pulmonary thromboembolism, bacteremia, endocarditis, tricuspid regurgitation, right heart failure, or cardiac arrest if left untreated.

In this case report, we present a patient who presented to the hospital with syncope during hemodialysis and was determined to have a massive thrombus in the right atrium.

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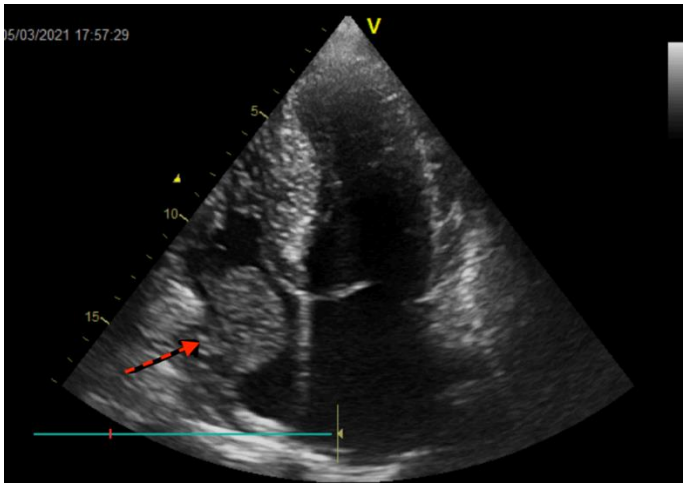
Case presentation

A 48-year-old male follow-up patient with hypertrophic cardiomyopathy (HCM) was diagnosed with chronic kidney failure 2 years after contrast examination. The patient presented with syncope that occurred during his last routine hemodialysis. The patient experienced recurrent fever over the past year and received antibiotics and anticoagulant medication. Echocardiography imaging showed a 30 × 17 mm hyperechogenic mass at the tip of the catheter. The patient's medical history included two episodes of cardiac arrest due to hyperkalemia in the past year. Before admission to our clinic, the patient's central venous catheter was removed at the nephrology department after the last hemodialysis.

The patient's complaints consisted of a 2 month history of weakness and palpitations induced by minimal effort and dizziness after standing up. Physical examination displayed no pathological signs except a 3/6 systolic murmur at the tricuspid auscultation site. Echocardiography imaging revealed left ventricular hypertrophy and a 40 × 35 mm well-circumscribed pedicled hyperechogenic mass at the right atrium attached to the inferior vena cava orifice, which advances from the tricuspid valve into the right ventricle during diastole and occludes the tricuspid annulus (Figure 1). The image showed tricuspid regurgitation of moderate severity induced by the mass.

The patient was admitted to the intensive care unit and put under hemodynamic monitoring. Following further evaluation, the heart team chose surgical thrombectomy as the initial method of approach. The patient later refused treatment and was discharged. We believe that our patient's presyncope and syncope attacks developed due to the relative decrease in right atrium size secondary to hypovolemia, especially following hemodialysis, which led to decreased right atrium and right ventricle filling and a rapid reduction in cardiac output. Due to the large size of the mass, lytic therapy was not considered applicable as the mass could detach during treatment and completely obstruct the tricuspid annulus or the right ventricular outlet, potentially leading to death. The patient's consent was obtained for the clinical presentation.

Figure 1. Echocardiography imaging revealed left ventricular hypertrophy and a 40 × 35 mm well-circumscribed pedicled hyperechogenic mass at the right atrium.



Discussion

The complications associated with central venous catheters are divided into two categories: infectious and non-infectious. Thrombi formation is the most common non-infectious complication. Echocardiographic documentation of right heart thrombi has poor prognostic implications. Pulmonary embolism occurs in 67% of cases, and the early mortality rate is 42% in such patients [4]. There are two major types of thrombi. Type A thrombi are large, mobile and serpiginous; they usually originate outside the heart within the venous structures and are quite lethal. Type B are laminated thrombi related to blood stasis in dilated dysfunctional right heart structures; they are associated with a very low mortality rate [5]. The optimal management of patients with catheter-related atrial thrombi is still uncertain.

Reported treatment options for catheter-induced thrombosis include removal of the catheter, very-low-dose-warfarin (1 mg daily, in a mixed oncological population) [6], fibrinolytic therapy [7], low-molecular-weight heparin [8], observation, catheter-directed thrombolysis, percutaneous retrieval of thrombi with basket versus vacuum-assisted thrombectomy [4], and surgical thrombectomy. Surgery should be considered in the beginning if the thrombus is infected [9]. Given the symptoms and the size of the thrombi, the patient was thought to be at high risk of embolization and tricuspid valve obstruction with anticoagulant medication alone. Therefore, surgical thrombectomy was preferred by the heart team.

Conclusion

In hemodialysis patients, especially those with a central venous catheter who experience presyncope-syncope attacks during hemodialysis, clinicians should consider the possibility of a massive thrombus in the right atrium or catheter tip.

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