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Case Report

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Incidental Right Atrial Thrombus in an 18-Year-Old Female Patient

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Abstract

Thrombus formation in the right atrium has been quite rare and is generally associated with venous thromboembolism and foreign bodies in the right heart chambers. However, as more permanent hemodialysis catheters are implanted into patients with an end-stage renal disease, the incidence of right heart thrombus tends to increase. Unfortunately, despite its high mortality rate, there is no consensus on its treatment. In our case, a right atrial mass in an 18-year-old asymptomatic female patient who has been on peritoneal dialysis for many years due to end-stage renal disease was incidentally found. Her medical history included the placement of a jugular hemodialysis catheter due to peritonitis. During patient's diagnostic workup, cardiac magnetic resonance imaging was performed where the features of the mass were consistent with thrombus. After a 3-month course of anticoagulation, the thrombus resolved completely. Cardiac magnetic resonance imaging with its high sensitivity and specificity plays a pivotal role in identifying thrombi of rare locations. Anticoagulation in the absence of absolute contraindication may be the first option in catheter-related thrombus cases.

Keywords: Thrombus, hemodialysis catheter, right atrium, cardiac magnetic resonance

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INTRODUCTION

Isolated right atrial thrombi are relatively uncommon compared with thrombi found in other heart chambers. The incidence of right heart thrombus ranges from 2% to 18% and is found to be 29% in a postmortem study (1). Frequent etiological factors are foreign bodies, such as permanent central venous catheters, thrombophilic states, cardiac surgery, vasculitis, and venous thromboembolism (2). Treatment options include anticoagulation, thrombolytic therapy, catheter-based interventions, and surgery. Although the mortality rate can be as high as 18%, there are no specific established guidelines or treatment algorithms (1). The incidence is expected to increase as more patients with chronic renal failure are treated with permanent venous hemodialysis catheters. In this case study, we report an 18-year-old asymptomatic female patient who had a large isolated right atrial thrombus that was treated successfully with warfarin alone.

CASE PRESENTATION

An 18-year-old female patient who had been on chronic peritoneal dialysis for many years was referred to us for routine evaluation before renal transplantation. She had had a peritoneal infection 3 months earlier, which led to the cessation of peritoneal dialysis and the placement of a temporary jugular central catheter for hemodialysis. After approximately 2 months, peritoneal dialysis had been resumed, and the hemodialysis catheter had been removed without complication. During her first cardiac evaluation, although she was totally asymptomatic, a 1.7×1.6 cm immobile mass was noted in the right atrium during transthoracic echocardiography (Figure 1a). Her cardiac examina-

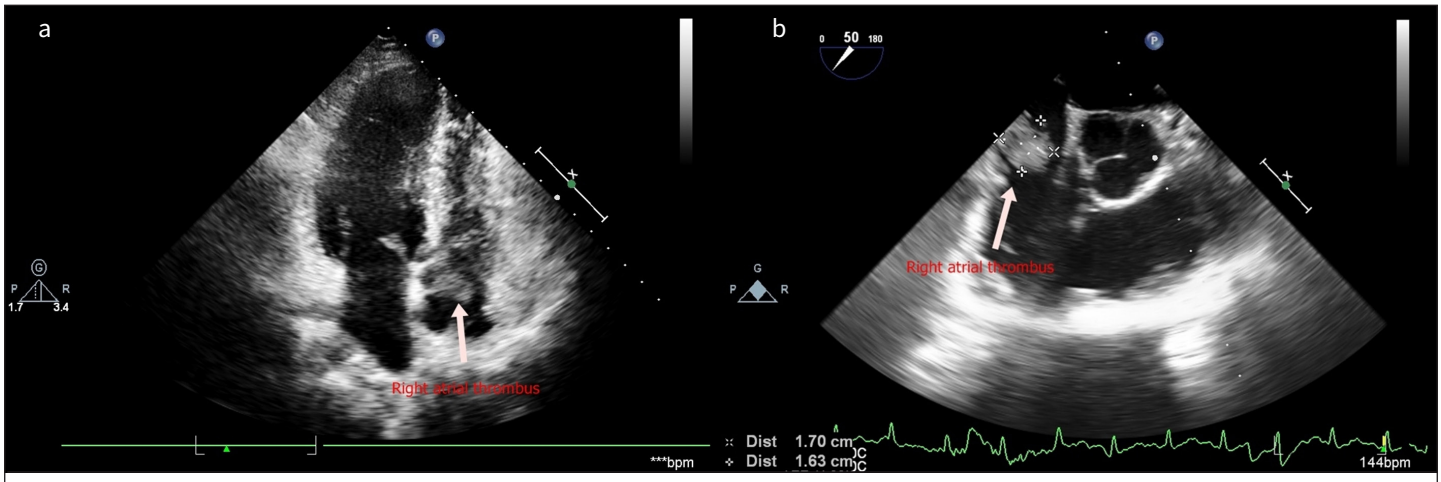

Figure 1. a, b. Transthoracic and transesophageal echocardiographic images of the right atrial thrombus.

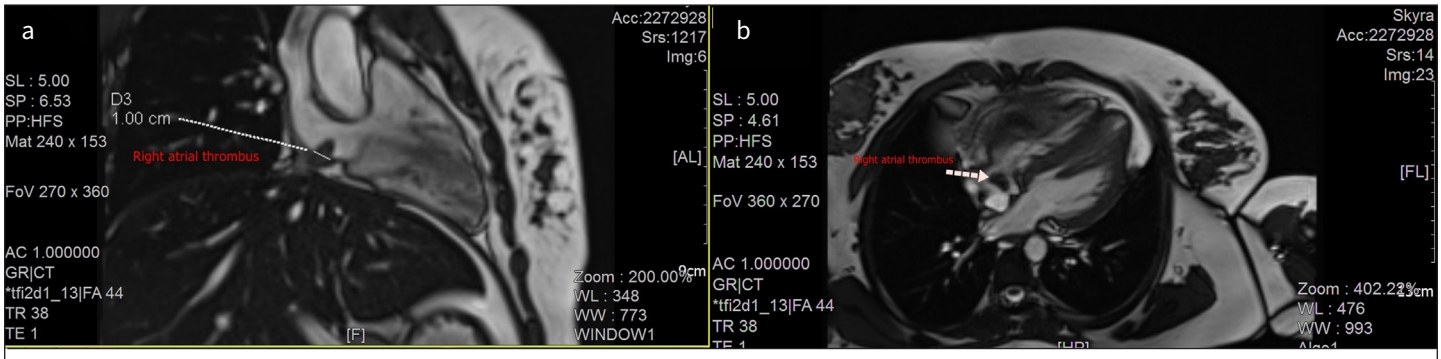

Figure 2. a, b. Sagittal two chamber and axial four chamber cardiac magnetic resonance sequences (2D TrueFISP) demonstrating right atrial thrombus.

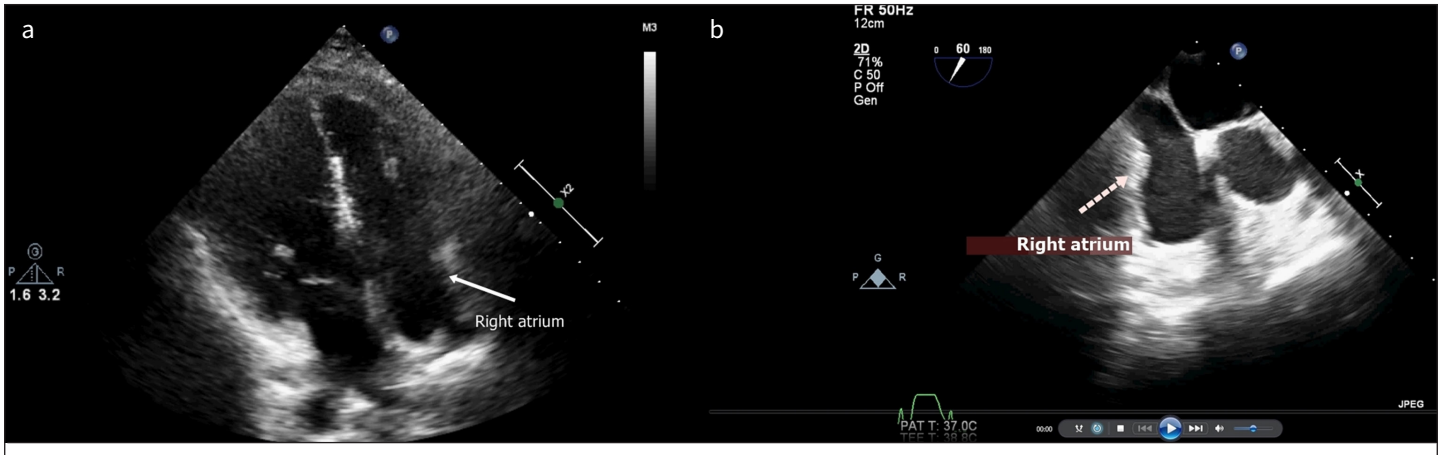

Figure 3. a, b. Transthoracic and transesophageal echocardiographic images showing complete resolution of atrial thrombus.

tion and laboratory tests were unremarkable, except for findings of chronic renal insufficiency. A transesophageal echocardiography was performed to further define the mass, revealing that the mass was attached to the right atrial free wall, had well-defined borders, and had a homogeneous structure without overt calcification (Figure 1b). The right heart chambers were not dilated, and there was no evidence of pulmonary hypertension or right ventricular dysfunction. At this point, although the most probable diagnosis was a thrombus, cardiac magnetic resonance imaging was performed. T1 and T2 images indicated a definite thrombus next to the crista terminalis of the right atrium (Figure 2a, b). After consultation with nephrologists and cardiovascular surgeons, considering that the patient was asymptomatic and there was no sign of a hemodynamic instability, the patient was anticoagulated with warfarin. After a 3-month course of anticoagulation, the thrombus resolved completely, and the patient tolerated the treatment well without any complications (Figure 3a, b). Written informed consent was received from the patient who participated in this study.

DISCUSSION

As more permanent hemodialysis catheters are implanted into patients with an end-stage renal disease, the incidence of right heart thrombus tends to increase. Catheter-related thrombus is usually found in structurally normal atria, is immobile, and has a lower mortality rate than rate than atrial fibrillation related thrombus that is highly mobile and has a higher mortality rate (3). Although the exact mechanism by which catheter-related thrombus occurs is uncertain, the irritation caused by the catheter tip, combined with the high flow rate, may lead to endothelial damage with subsequent activation of coagulation, platelet aggregation, and thrombus formation (4). Therefore, the National Kidney Foundation Dialysis Outcomes Quality Initiative guidelines recommend adjusting the catheter tip just to the level of the cava atrial junction to prevent atrial thrombosis while ensuring adequate flow (5).

The differential diagnosis of atrial should always be done in a timely manner to eliminate cardiac neoplasms prior to initiating therapy. Cardiac magnetic resonance has a high sensitivity and specificity for cardiac masses. It can assess T1-weighted and T2-weighted characteristics, has the ability to use fat-suppression techniques to define the histopathological characteristics of a mass, and can accurately distinguish thrombi from other masses (6). In our case, although thrombus was the most probable diagnosis, a cardiac magnetic resonance was performed to further define the mass and its associations with the surrounding structures.

The treatment options consist of systemic anticoagulation, thrombolytic therapy, catheter-based interventions, and cardiac surgery. Despite the high mortality rate, the optimal treatment method for each scenario is unknown. A meta-analysis evaluating 71 patients with catheter-related thrombosis found no survival benefit in patients treated surgically versus medically, and the overall mortality rate was found to be 18.3% (1). The most common causes of death were pulmonary embolism and septic shock. The authors of the meta-analysis recommended anticoagulation as first-line therapy. Patients who have a contraindication or failed anticoagulation therapy may be candidates for surgery. There are a few case reports describing the utilization of catheter-directed therapies with very limited experience (7). In our case, anticoagulation was initiated after thorough discussions with the patient and the cardiovascular surgeon.

CONCLUSION

We believe that anticoagulation in the absence of absolute contraindication may be the first option for patients with catheter-related thrombus. In addition, cardiac magnetic resonance with its high sensitivity and specificity can play a major role in identifying thrombi in such rare sites.

Informed Consent: Written informed consent was received from the patient who participated in this study.

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Conflict of Interest: The authors have no conflict of interest to declare.

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