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Case Report
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Inferior Vena Cava Vegetation in a Patient with Hemodialysis Catheter: A Case-Report study

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ABSTRACT

Hemodialysis catheter-related infections are associated with increased morbidity and mortality in end-stage renal disease patients. Here we present a case of an end-stage renal disease patient who presented with fever and weakness. During workup, we found a deeply inserted jugular vein double lumen catheter into the inferior vena cava that was complicated by infection.

Keywords: Hemodialysis, Endocarditis, ESRD, Catheter infection, Inferior vena cava

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Introduction

Over recent decades, an increase in the prevalence of end-stage renal disease (ESRD) has been reported; and in most ESRD patients, hemodialysis is the major modality of renal replacement therapy (1). Double lumen catheters are frequently used as vascular access for hemodialysis and can lead to several complications like bacteremia, thrombosis, superior vena cava (SVC) syndrome, and thromboembolism (2). Catheter-associated infections in hemodialysis patients are accompanied by significant morbidity and mortality (3). Here we report a case of an ESRD patient receiving hemodialysis via a double lumen catheter, who developed inferior vena cava (IVC) infection due to a deeply inserted jugular vein double lumen catheter.

Case report

The patient was a 17-year-old man with a past medical history of meningomyelocele and ESRD receiving hemodialysis two times a week since 1.5 years ago. He was admitted to the hospital with fever, weakness, and loss of appetite. He had femoral vein double lumen catheter insertion four months before admission due to non-functional internal jugular vein permcath, but the femoral catheter was removed after three weeks because of lower limb edema that was related to the saphenofemoral junction and femoral vein thrombosis. After that, the patient was undergoing anticoagulation therapy, an internal jugular vein double lumen catheter was inserted, and he was on routine hemodialysis until presented with a fever.

During the workup, the inflammatory laboratory tests were done and a blood culture was requested. According to the test results, the erythrocyte sedimentation rate (ESR) was elevated and leukocytosis was evident. Because of positive blood culture with *staphylococcus aureus* on evaluation of fever, he was referred to us for echocardiography. Transthoracic echocardiography (TTE) revealed a large (1.8×0.59 cm) mobile heterogeneous mass in the IVC-right atrium junction that was extended toward the IVC lumen, suggesting vegetation or infected thrombus (based on clinical data). Also, we detected a dialysis catheter in IVC (figure 1) with suspicious femoral catheter remnants or a deeply inserted jugular vein catheter. Further evaluation by TTE and fluoroscopy was done and showed no femoral catheter remnants but the jugular vein catheter was deeply inserted from SVC to the right atrium (RA) and IVC (video 1,2). Considering that there was no alternative access for hemodialysis, the catheter was exchanged over the wire with the tip of the new catheter in the SVC-RA junction.

After two weeks of antibiotic therapy, the TTE was repeated and no residual mass was seen and the patient completed his course of antibiotic therapy without complication.

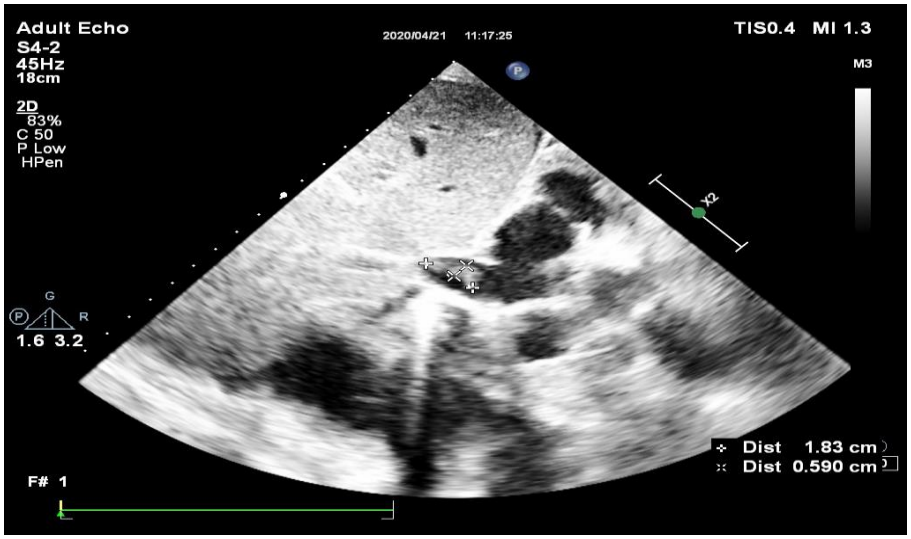

Figure 1A. Subcostal view in TTE showed a heterogeneous mobile mass in IVC, suggesting vegetation or infected thrombus.

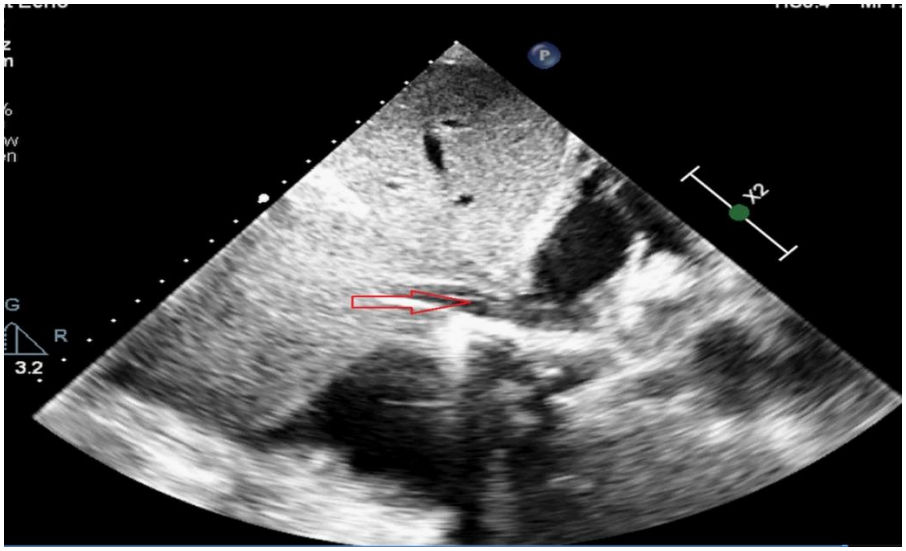

Figure 1B. Subcostal view in TTE showed a double lumen catheter in IVC (red arrow).

Discussion

We introduced a case of catheter-related IVC infection. There is an increased risk of infective endocarditis in patients receiving hemodialysis because of vascular access manipulation. In a study, the overall rate of catheter infection was 38.61% (4). Dialysis access-associated infections contribute to an increased risk of morbidity and mortality among ESRD patients.

Vascular access in ESRD patients who receive dialysis via a catheter is usually provided by the internal jugular, femoral, and subclavian veins. The optimal position for the catheter tip is the upper part of the right atrium. Dialysis catheters are frequently placed in SVC; several cases of SVC endocarditis associated with hemodialysis catheters are reported (3,5,6). Chao TF (3) reported a case of ESRD presented with fever, and in her evaluation by transesophageal echocardiography (TEE), vegetation was diagnosed in SVC. Avendaño-Pérez L (5) described a patient with chronic renal failure hospitalized after an acute gout attack. During her admission because of fever and cardiovascular symptoms, TEE was done and revealed multiple vegetation in RA and SVC and the diagnosis of infective endocarditis was made her. Although we did not find any report of IVC infection in medical literature to date, some cases of malposition of the catheter tip in hepatic veins via IVC were reported (7).

Conclusion

This case report shows the significance of checking the position of the catheter tip after its insertion, for which an ultrasound-guided approach is preferred; because the malposition of the catheter tip can increase the risk of complications. Furthermore, considering that the best way of vascular access in hemodialysis is an arteriovenous fistula, it should be provided in ESRD patients when possible.

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