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Aortic Dissection: Unusual and Rare Complication during Subclavian Vein Catheterization in a Hemodialysis Patient

We present a 56-year-old female with end stage renal disease (ESRD). As the patient had no vascular access for hemodialysis, the catheter was inserted in the right subclavian vein without an imaging guide. The woman experienced sudden chest pain and hypotension. Imaging showed a malposition of the catheter in the subclavian artery instead of the subclavian vein with dissection of the thoracic and abdominal aorta. This is a rare complication of subclavian vein catheterization for hemodialysis. We discuss this patient because she is the first in the international bibliography. This case report shows that for patients with poor venous access, catheter placement under angiographic control may be helpful.

Keywords: Aortic Dissection, Catheterization, Renal Dialysis

Introduction

Common complications of venous catheter dialysis include sepsis and accidental removal. Angiographic demonstration of the dialysis line is only rarely requested, usually to confirm the presence of a clot or stenosis as a cause of poor dialysis flow.[1]

Several cases of catheter tip malposition have been reported in the venous system,[2] but we did not find a report for catheter tip malplacement in an artery.

Case Presentation

A 56-year-old female suddenly developed a crushing, tearing chest pain radiating to her back during the insertion of a subclavian vein catheter which was done without an imaging guide.

She was known to have a history of hypertension and hypertensive nephropathy. Now she had developed chronic renal failure, and requested subclavian vein catheter insertion for dialysis.

On examination, she was anxious, diaphoretic, hypertensive, and dyspneic but not in shock. She had left ventricular hypertrophy on ECG but no evidence of myocardial infarction. She had dullness and decreased breath sounds on both sides. On CXR, the aortic margin was blurred, and there was fluid (blood) in both pleural spaces (Fig.1).The distance between the calcified intima and the aortic margin had increased in comparison to the previous films, and the catheter appeared to be malpositioned.

Pleural effusion sampling showed frank blood fluid. In echocardiography, aortic dissection and intimal flap were easily seen (Fig.2). An emergency CT angiography showed the catheter in the arch and proximal descending aorta instead of the subclavian vein (Figs.3A and B), and the aorta was dissected from the arch to the bifurcation. There was no thrombosis in the lumen, and

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Fig. 1. The distance between the calcified intima and the aortic margin had increased.

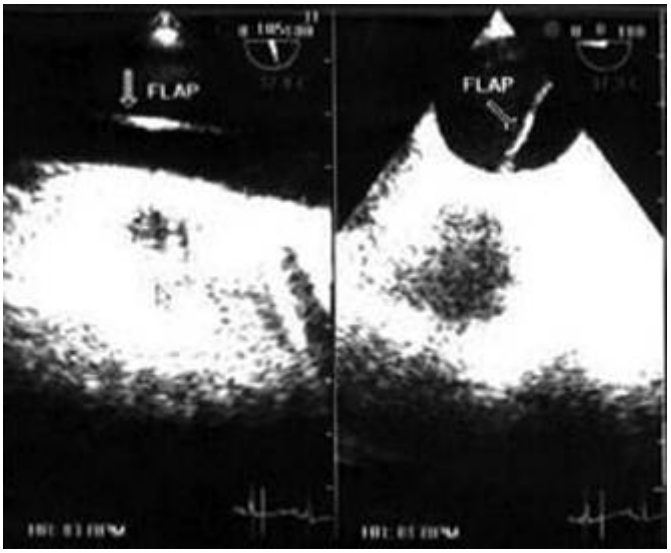


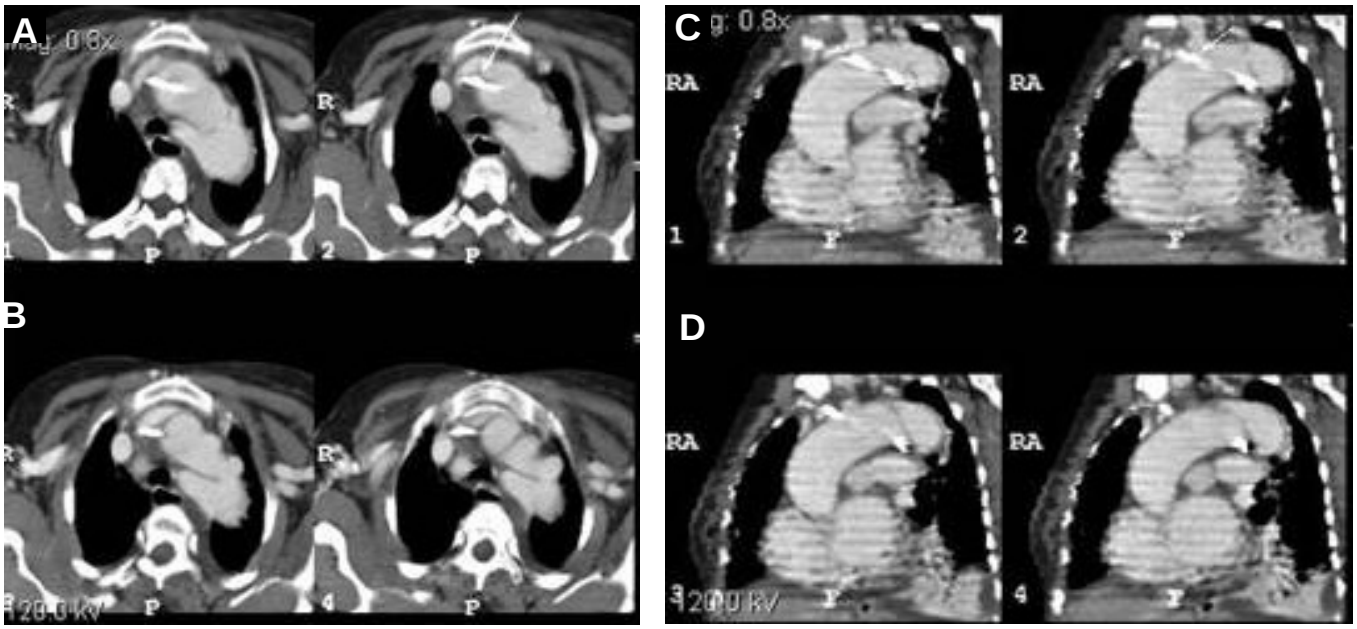
Fig. 2. In echocardiography, aortic dissection and intimal flap were easily seen

enhancement of both lumens was seen (Figs. 3C and D). It was an iatrogenic aortic dissection (AD) due to malposition of the subclavian vein catheter. After operating the patient, acute symptoms resolved, and the patient was discharged from the hospital 31 days after the iatrogenic aortic dissection.

Discussion

The main indications of starting catheter dialysis are absence or disappearance of an adequate vascular access. Most hazardous complications are sepsis, malposition, hemothorax, bleeding, vena cava thrombosis, and pneumothorax.[3]

No mortal complications were seen in a 5 year prospective study of 257 consecutive patients by Vanholder et al.[3] Skandalos et al. reported 8 cases of catheter tip malplacement among 385 permanent central vein catheters for hemodialysis [3.69%]. In his study, there were 8 episodes of catheter tip malplacement in the azygos vein (1 case), hemiazygos vein, left internal thoracic vein, and the contralateral innominate vein.[2] He suggested that the placement of a permanent central vein catheter for hemodialysis must be followed by simple X-Ray or venography evaluation of its correct position or function.[2] Stewart



Figs. 3. A and B. An emergency CT angiography showed the catheter in the subclavian artery instead of the subclavian vein.
C and D. The aorta was dissected from the arch to the bifurcation. There was no thrombosis in the lumen and enhancement of both lumens.

et al. reported a case of azygos catheter placement as a cause of dialysis failure. He suggests that in such patients with poor venous access, catheter placement under angiographic control may be helpful.

Sotirako Paulos et al.[4] reported a case of incorrect placement of hemodialysis catheters in the mammalian vein, and the necessity for urgent X-Ray evaluation for its position. But we have not seen any report of hemodialysis catheter malplacement in the subclavian artery, and acute aortic dissection following it. In one study with over 550 cases of aortic dissections, there were 33 cases (6%) of iatrogenic aortic dissection; but there was no report that subclavian catheter hemodialysis insertion is a cause of iatrogenic aortic dissection.[5]

In another study of 723 patients with aortic dissection in the IRAD (international registry aortic dissection) data base, 34(4.7%) had iatrogenic AD. Sixty nine percent of type A iatrogenic AD were caused by surgical cardiac procedures, whereas 88% of type B iatrogenic AD were caused by cardiac catheterization procedures.[6] However there was no report of subclavian catheter insertion as a cause of iatrogenic aortic dissection.[6]

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