

A Case of Misplaced Permacath Dialysis Catheter

Mohammed Arshad Ali^{1*}, kishore Raikar² and Asha Kishore³

¹Consultant and Head of Department of Anesthesia and ICU, Dibba hospital, UAE

^{2,3}Specialist in Anesthesia and ICU, Dibba hospital, UAE

Abstract

Central venous placement using ultrasound has significantly reduced the complications associated with blind puncture. The central venous catheter can still get misplaced if it follows an anomalous route after appropriate puncture of desired vessel. We report a case of misplaced dialysis catheter into the accessory hemiazygos vein which resulted in a large hemothorax and we recommend the routine use of fluoroscope for placement of dialysis catheters so as to avoid serious complications.

Keywords: Permacath; Ultrasound; Accessory hemiazygos vein; Hemothorax

Introduction

Central line placement is associated with risk of inadvertent puncture of artery, pleura and other nearby structures. These risks have been very much reduced with the use of point of care ultrasound. Even though ultrasound can guide proper puncture of the vessel desired, it cannot help in following or directing the course of the catheter after venepuncture. Misplacement of a large catheter such as the dialysis catheter can have serious consequences. We report here a case of misplaced dialysis catheter into the accessory hemiazygos vein.

Case Report

A 63 years old woman, known case of Chronic Renal Failure was admitted to the hospital for urgent dialysis. Her serum creatinine was 1444 micro mol/L and her Blood Urea Nitrogen was 48.7 mmol/l. Her serum potassium was 6.2 mmol/L. She was mentally retarded with aggressive behavior. She had had dialysis catheter placed many times which she had pulled out during her bursts of aggressive behavior. AV fistula was done one time which also failed. This time she presented without a dialysis catheter. We decided to place a permacath in the Operation theater. She was given light General Anesthesia. We chose the internal jugular as the vein of choice for the procedure. With ultrasound we assessed her internal jugulars. Her previous tunneled catheter which she had pulled out before was in the right internal jugular. This time the right internal jugular could not be visualized at all with ultrasound. It was presumed that either it was thrombosed or hidden in the fibrosis of the surrounding soft tissues. The left internal jugular was visible clearly. Under sterile precautions it was punctured under ultrasound guidance and the guide wire was passed. There was slight difficulty in passing the guide wire but after some manipulation it passed. There were no ectopics in the ECG when the guide wire was passed. Ultrasound was used and guide wire was identified as a bright speck inside the Internal Jugular Vein in short axis. Fluoroscope was not used as it was engaged in some other case. Having clearly confirmed the guide wire presence in the IJV, we decided to proceed further. The dialysis catheter was tunneled from a suitable site in her chest. A peel away introducer was passed over the guide wire and the wire removed. Typical venous blood was observed exiting from the introducer and the permacath was passed as the introducer was peeled off. Typical venous blood was aspirated from both permacath lumens and lumens were flushed and closed with heparin lock. The procedure seemed uneventful and the patient was made awake. A routine portable X-ray was ordered before shifting the patient to dialysis unit. When we saw the X-ray we were shocked to find the catheter entirely in the left side of heart as though it had passed through aorta (Figure 1). We took the patient

back to OT and connected a transducer to the catheter port which showed a venous waveform. A blood gas analysis of the aspirated blood also showed venous values. Anyhow it was decided to leave the catheter untouched at that time as the patient was unstable. We urgently placed a regular dialysis catheter in her right femoral vein and she was sent for dialysis. After 3 days of dialysis, the patient became stable and CT chest was done. The preliminary X-ray done during CT clarified the position of the catheter in the lateral edge of aortic knuckle (Figure 2), which is the location of left superior intercostal vein. The reconstructed coronal and sagittal CT images (Figures 3 and 4) showed the catheter tending to go into the accessory hemiazygos vein which communicates with the left superior intercostal vein. The X-ray and CT films also showed large hemothorax in the left side which suggested that the veins were partially damaged by the large catheter. As the patient was very stable, we just removed the catheter and applied pressure dressing at the entry site. The patient tolerated it without any problems. The hemothorax was kept under observation as the patient did not have any respiratory distress and the relatives did not give consent for chest tube insertion. The hemothorax was persistent but not increased in size. After another 3 days once consent was obtained, we inserted an Inter Costal Drainage tube on the left side and drained about 1500 ml of altered blood. The

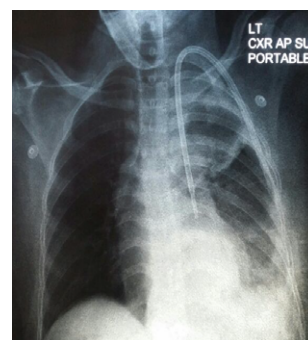


Figure 1: Catheter entirely in the left side of heart as though it had passed through aorta.

***Corresponding author:** Mohammed Arshad Ali, Consultant and Head of Dept of Anesthesia and ICU, Dibba hospital, PO Box 11414, UAE, E-mail: faryas99@yahoo.com

Received July 07, 2014; Accepted August 20, 2014; Published August 22, 2014

Citation: Ali MA, Raikar K, Kishore A (2014) A Case of Misplaced Permacath Dialysis Catheter. J Clin Case Rep 4: 400. doi:10.4172/2165-7920.1000400

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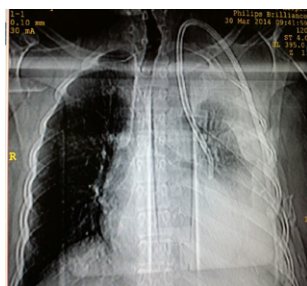


Figure 2: The preliminary X-ray done during CT clarified the position of the catheter in the lateral edge of aortic knuckle.

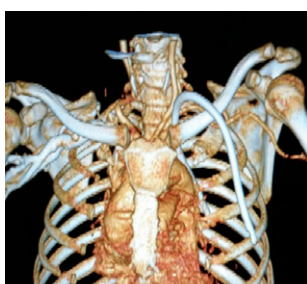


Figure 3: The reconstructed coronal and sagittal CT image.



Figure 4: The reconstructed coronal and sagittal CT image.

lung expanded completely and the ICD was removed. The patient was safely discharged subsequently.

Discussion

A catheter passing through left brachiocephalic has a chance of taking 3 anomalous routes. One is the left superior intercostal vein [1] which communicates with accessory hemiazygos [2] as in our case. The other is left internal thoracic vein [3] which runs anterior to the aortic knuckle. One other possibility is the pericardiophrenic vein [4] which runs along the lateral cardiac border. Misplaced central lines in all these locations have been reported and have not usually resulted in serious consequences except in the case of pericardiophrenic vein. Misplacement of the large dialysis catheter in these locations has been reported [5,6] and can have dangerous consequences such as

hemothorax, pneumothorax, hemopericardium, cardiac tamponade etc. Even though entry of catheter into a planned vein can be ensured using ultrasound, its subsequent passage cannot be controlled.

Conclusion

An X-ray or fluoroscopic confirmation of the seldinger guide wire in the right location prior to passage of the large dialysis catheter will eliminate many of the serious risks of malposition and is mandatory for patient safety.

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