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# Retrieval of Tunneled Cuffed Venous Catheter Due to Accidental Catheterization of Subclavian Artery

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**ABSTRACT**

Tunneled cuffed venous catheter or permacath insertion is used routinely in intensive care management and chronic kidney disease patient for dialysis. We report an unusual case of 43Y old male patient case of chronic kidney disease on dialysis in whom a 14.5 Fr tunneled cuffed venous catheter was retrieved from subclavian artery due to accidental catheterization following insertion of catheter from internal jugular vein.

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## Introduction

Subclavian vein catheterization is used most commonly in ICU and complications like accidental puncture presents a uncommon but potentially life threatening complication. The reported rate of accidental arterial puncture is around 1% and 2.7% through subclavian and jugular approaches. The reported incidence of subclavain artery injury is less than 5% The subclavian vessels are protected because of there lie behind clavicle bone so a significant mechanism is often required to cause injury (1). We report a case of accidental catheterization of subclavian artery during insertion of catheter for hemodialysis.

## Case Presentation

A 43 years old male patient having chronic kidney disease underwent a tunneled cuffed venous catheter insertion for hemodialysis in our hospital. Routine post procedural chest x-ray showed the catheter in an abnormal location. However, a contrast study could not be done to confirm this as the patient's creatinine was 16.72mg/dl. Hence a chest CT scan was done which revealed that central venous catheter had pierced right internal jugular vein (IJV), right brachiocephalic artery and its tip was lying in the arch of aorta (figure 1). Hence the patient was referred for surgical removal.

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The patient was planned for exploration and removal of catheter in operation theater after undergoing hemodialysis through a separate femoral line. The plan was to repair both arterial and venous sites of injury under general anesthesia. Under aseptic precautions, a vertical incision was taken along the line of catheter and deepened until the vascular plane. Our findings at exploration were unlike that of CT scan and there was no IJV injury and the catheter had not pierced the right brachiocephalic artery. On further exploration along the artery the catheter was seen entering the 2rd part of right subclavian artery (figure 2). The subclavian artery was looped proximally and distally and injection heparin 5000 international units was administered and clamps were applied and catheter was removed (figure 3). The rent was closed with polypropylene 6-0 suture in a continuous manner in a single manner, skin was closed in layers without any drain. Patient underwent procedure well without any complication and was discharged on the 2nd postoperative day.

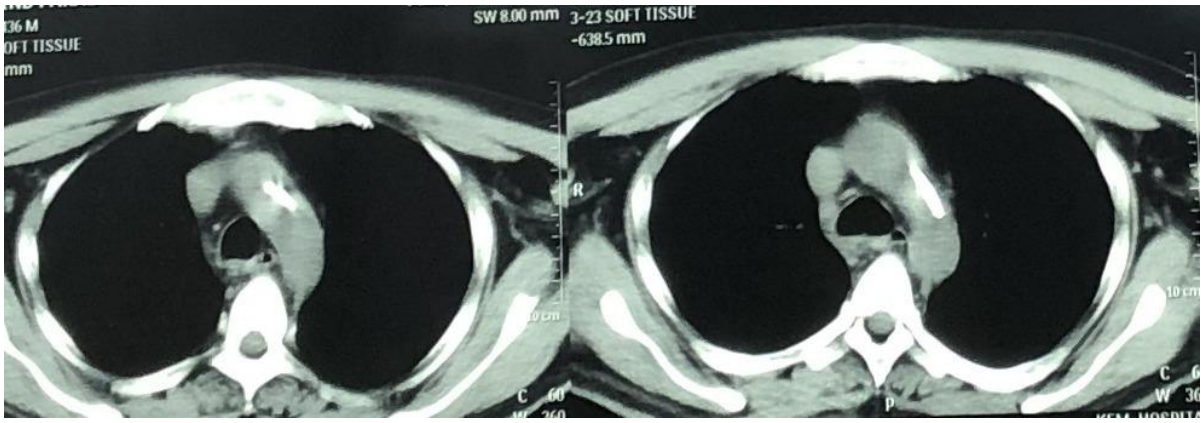


**Figure 1**. CT scan shows catheter passing through the right brachiocephalic trunk.

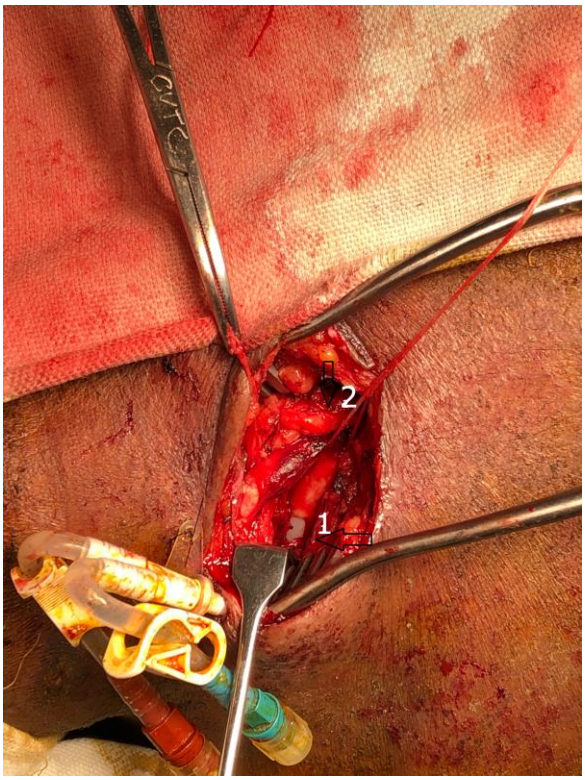


**Figure 2.** Arrow mark shows catheter entering into 1) subclavian artery 2) carotid artery.

## Discussion

The right internal jugular vein is the common site for catheterization because of easy identifiable landmarks and accessibility. Even though it is a relatively simple procedure it is associated with uncommon complications like trauma to nearby vessels. Case reports of misplaced of IJV catheters in subclavian artery have been reported in literature. Arterial cannulation are often associated with stroke, hemothorax, AV fistula formation, plaque dislodgement, pseudo aneurysm and even death (1). Such complications are might be due to technique related like too much of head extension or rotation may increase the likelihood of arterial injury (2). Accidental cannulation of artery can be identified by high-pressure backflow pulsatile jet of the blood and there might be a difficulty in administration of fluid through the same line. Secondly dark non-pulsatile venous blood vrs bright red pulsatile flow can be used as a differentiating factor (3). Few other methods like comparison of PaO2 of the blood sample, check for arterial waveform, chest xray, colour doppler are used for confirming artery puncture (1,4). There are few measures which can avoid such complications includes better anatomical knowledge, using a more cephalic insertion point to limit the insertion of needle and by using ultrasound for better visualization during insertion (5).

Our patient underwent non contrast CT scan because of high creatinine and pre-existing kidney disease this probably lead to miss judgement of the course of the catheter. Had been it possible to do a contrast study, we would have had a correct idea of the location of catheter. Our incision was made to facilitate good exposure of IJV, right brachiocephalic and carotid artery. We found it technically demanding to expose and suture the right subclavian artery rent through the same incision. In retrospect, if we had a correct diagnosis, we would probably have just removed the catheter and applied pressure or approached the same via a different incision. Identification of misplaced central lines, audit of complications and preventive measures are needed to avoid such complications. Surgical exploration after proper investigations can be carried out for retrieval of misplaced catheters with proper vessel control, however the surgeon should be ready to expect surprises on table similar to what we encountered.

**Figure 3**. Retrieved catheter from subclavian artery

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