

UNUSUAL MALPOSITION OF DIALYSIS CATHETER IN THE LEFT INTERNAL MAMMARY VEIN

- A Case Report -

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Abstract

Malpositioning of intravascular catheter is a known complication. We describe a case of a pregnant lady in whom dialysis catheter was inserted through the left internal jugular vein (IJV). It was malpositioned in the left internal mammary vein (IMV) which is very unusual site for a dialysis catheter. It was detected by chest X-Ray and confirmed by venography.

Key words: Dialysis, intravascular catheter, malposition, venography, internal mammary vein.

Introduction

Cannulation of IJV for placement of dialysis catheter is usually done for hemodialysis in patients with end-stage renal disease. Malposition of central venous pressure (CVP) catheter is a known complication. Accidental malpositioning of central venous catheter into the IMV is reported but literature on accidental malpositioning of dialysis catheter into internal mammary vein is very rare. We report a rare malposition of hemodialysis catheter into left IMV during left IJV cannulation, which was recognized on venography.

Case report

We describe a case of 19 weeks pregnant woman, a known case of systemic lupus erythematosus (SLE). She had a missed abortion and presented in emergency with sepsis. She was intubated and put on ventilator in the intensive care unit. She went into renal failure and hemodialysis was planned. Left sided IJV cannulation was attempted because already there was a CVP line in the right IJV. Anatomical landmark technique was used. After confirmation of free venous blood flow on aspiration through locator needle, a guide wire was passed; the operator found no difficulty in passing the guide wire. Dialysis catheter (12 French diameter) was passed over the guide wire (Seldinger's technique). Some resistance was found in inserting the dialysis catheter beyond the 14 cm mark. On aspiration we had a very little back flow of blood but saline could be easily

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injected through the catheter. X-Ray of chest 'anterior posterior view' was done which showed the dialysis catheter running straight down on the left side of the chest instead of going to the right side towards superior vena cava (Fig. 1). Initially it was suspected that the patient might have had a left superior vena cava and the catheter was placed in it. In order to define the anatomy and position of the catheter, intravenous contrast dye was injected through the dialysis catheter and was flushed with 20 ml of normal saline, and chest x-ray was done simultaneously which showed the dialysis catheter in the left IMV. Although IMV is a small diameter vein, it was not ruptured by the dialysis catheter as evident by contrast dye flowing from the left IMV through a communicating vein to the right IMV (Fig. 2). The catheter was removed and a new catheter was inserted successfully through the right femoral vein. Patient had no other complications in either procedure.

Discussion

Malposition and other complications following central venous catheterization depend mainly on the site of venous approach. Catheter malposition during cannulation of IJV occurs only in 2% of cases¹. Most reported malpositions and other complications are related to the left IJV cannulation. There are case

reports of inadvertent placement of a jugular venous catheter into the left superior intercostal vein¹, left pericardiophrenic vein², accessory hemiazygos vein³, azygos arch⁴ and it can even go to the contralateral brachiocephalic vein⁵; but malposition of dialysis catheter in the left IMV is very rare⁶. Internal mammary veins drain into the brachiocephalic vein behind the sternal end of the clavicle and the first costal cartilage. It receives the anterior intercostal veins and some abdominal branches and travels along the border of the sternum to drain into the brachiocephalic vein. The orifice of the left IMV is more remote from the right-sided veins; it can only be entered by a catheter coming from the left brachiocephalic vein. In patients with portal hypertension, portal to systemic collateral circulation dilates the IMV and thus have a higher risk of malpositioning of the catheter. Our patient had no signs of portal hypertension. Chest pain was reported as the only clinical sign of IMV cannulation⁷. Our patient was artificially ventilated and sedated so chest pain as a sign of catheter malposition could not be detected. Free flow of blood on aspiration through the catheter is considered as an evidence of proper intravascular placement of catheter. In our case there was little back flow of blood through the dialysis catheter but aspiration of blood through catheter does not guarantee the correct placement in a large blood vessel⁵. Early recognition and management of malpositioned central

Fig. 1

Chest X-Ray 'anterior posterior view' showing dialysis catheter running straight down on the left side, pointed out by arrows (→). CVP line is also visible on the right side in the superior vena cava.

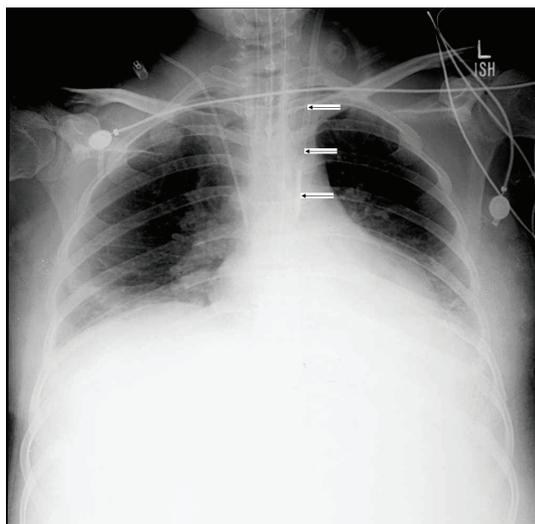
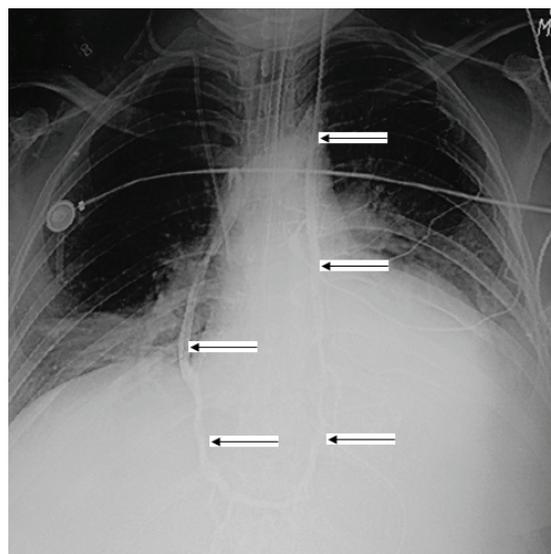


Fig. 2

Chest X-Ray 'anterior posterior view' after injection of contrast dye which is flowing from left IMV through a communicating vein to right IMV, pointed out by arrows (→).



venous catheter can prevent serious complications. Chest radiograph is considered necessary after IJV cannulation⁸; it helps in identifying the malposition and repositioning of the catheter. Failure to detect the malposition of the catheter can occur in the absence of a post-procedural check radiograph⁹. Sometime a plain radiograph alone does not clearly define the anatomy and malposition¹⁰, so in that case contrast injection and simultaneous radiography is helpful¹¹. In our

case venography was helpful in detecting the catheter malposition. Other available option to detect catheter malposition is computerized tomographic scan.

In conclusion, catheter malposition in the left internal mammary vein, although rare, but can happen during left internal jugular vein catheterization. Venography can be helpful in case of suspicion of catheter malposition.

References

1. TONG MKH, SIU YP, NG YY, KWAN TH, AU TC: Misplacement of a right internal jugular vein haemodialysis catheter into the mediastinum. *Hong Kong Med J*; 2004, 10:135-8.
2. ZAMAN MH, MITRA P, BONDI E, GINTAUTAS J, ABADIR AR: A rare malposition of the central venous catheter. *Chest*; 1990, 98:768-770.
3. MUHM M, SUNDER-PLASSMANN G, DRUML W: Malposition of a Dialysis Catheter in the Accessory Hemizygos Vein. *Anesth Analg*; 1996, 83:883-5.
4. GRANATA A, FIGUERA M, CASTELLINO S, LOGIAS F, BASILE A: Azygos arch cannulation by central venous catheters for hemodialysis. *J Vasc Access*; 2006, Jan-Mar, 7(1):43-5.
5. WEBB JG, SIMMONDS SD, CHAN-YAN C: Central venous catheter malposition presenting as chest pain. *Chest*; 1986, Feb, 89(2):309-12.
6. UNAL AE, BAYAR S, ARAT M, ILHAN O: Malpositioning of Hickman catheters, left versus right sided attempts. *Transfus Apher Sci*; 2003, Feb, 28(1):9-12.
7. SANDRONI C, PIRRONI T, TORTORA F, SANTANGELO S, RINALDI P, ANTONELLI M: Unusual central venous catheter malposition into the left internal mammary vein: a case report. *Intensive Care Med*; 2003, Dec, 29(12):2338-9.
8. GLADWIN MT, SLONIM A, LANDUCCI DL, GUTIERREZ DC, CUNNION RE: Cannulation of the internal jugular vein: is postprocedural chest radiography always necessary? *Crit Care Med*; 1999, Sep, 27(9):1819-23.
9. NARLAWAR RS, MORRIS BS, GOSAVI CP, MORKANE ND: Malpositioned central venous catheter in the left renal vein. *Indian J Radiol Imaging*; 2002, 12:447-8.
10. FARRELL J, WALSH J, GELLENS M, MARTIN KJ: Complications associated with insertion of jugular venous catheters for hemodialysis: the value of postprocedural radiograph. *Am J Kidney Dis*; 1997, Nov, 30(5):690-2.
11. MAFFESSANTI M, BORTOLOTTI P, KETTE F: Malpositions and complications following central venous catheterization in relation to the access site. *Radiol Med*; 1988, Jun, 75(6):609-12.

