

Insertion Of Haemodialysis Catheters: Fluoroscopy Guided Placement Technique For Mal-Positioned Wires

A El-Kayali

Citation

A El-Kayali. *Insertion Of Haemodialysis Catheters: Fluoroscopy Guided Placement Technique For Mal-Positioned Wires*. The Internet Journal of Nephrology. 2002 Volume 1 Number 1.

Abstract

Aim: Describe a technique for management malpositioned wires during percutaneous insertion of haemodialysis catheters.

Patient And Method: Three patients presented with end-stage renal failure (ESRF) and had percutaneous insertion of a permcath guided by fluoroscopy. The right internal jugular vein is recommended as proper site for this purpose.

Results: First and second cases showed malpositioned guide wire with patent right central veins. The right innominate vein was tightly stenosed in third case. Following our technique, the permcath was inserted into the right internal jugular vein (Cases 1,2) and into the left internal jugular vein (case 3).

Conclusion: Our technique of performing a table venography and using the dilator to guide the malpositioned wire is recommended in difficult cases of haemodialysis catheter insertion.

INTRODUCTION

Central venous access plays an important role in patients with end-stage renal failure (ESRF) undergoing haemodialysis.¹ Although arteriovenous fistula (AVF) remains the best route of dialysis in these patients, central venous access is required in 60% of them during their renal replacement therapy.² The right internal jugular vein is considered the first choice for cannulation as it has the least long-term complications.³ Technique of catheter insertion is either surgical cutdown^{4,5} or percutaneous Seldinger technique which is performed blindly^{2,6} or ultrasound guided.⁷

In this study, we are reporting a technique for the management of misplaced wires during percutaneous insertion of haemodialysis catheters (HC).

PATIENTS AND METHODS

CASE 1:

A 70 year-old-male who was known diabetic (DM), hypertensive (HTN), with ischemic heart disease had recently (2 months ago) developed ESRF. Insertion of central venous access was delayed two weeks because he developed right pleural effusion which has been tapped

twice. A haematemesis secondary to gastric erosion which was treated conservatively.

CASE 2:

A young male patient who was a known case of ESRF on haemodialysis through left arm arteriovenous graft for three years presented with an occluded graft. Previous history of AVF in both arms and haemodialysis catheter insertion in both internal jugular veins (IJVs) was present.

CASE 3:

Central venous access was requested for a 60-years-old male patient with history of HTN, DM and ESRF with previous history of created AVF in both arms and permcath insertion in right internal jugular vein.

METHOD

The patient was taken to the operating room, supine position with head tilted slight down. After cleaning the right side of the neck with betadine and under local anaesthesia a needle was fitted to a syringe filled with saline. The right IJV was punctured at the apex of the selldot triangle (above clavicle and between the two heads of sternoclavicular muscles). This was followed by the passage of a guide wire through

the needle under fluoroscopic guidance. The needle was then removed. A peel-away sheath was inserted over the wire. If fluoroscopy showed that wire was not in the proper place, a cannula (14 gauge) was passed over the wire (subsequently the wire was removed) to obtain venography of the central veins. In case of patent innominate vein and superior vena cava, a dilator was used as a guidant catheter to straighten the curved tip of the wire and guided by fluoroscopy at the site of the innominate vein branching.

A subcutaneous tunnel was created by using a metallic probe. The tunnel was lateral to venotomy site. The double lumen catheter was passed through the sheath which was removed. The catheter tip rested at the right atrium and was finally flushed with heparin.

RESULTS

CASE 1:

Fluoroscopy showed the guide wire going from right to left IJV after repeated trials (Fig. 1). Our technique as explained in the method, included first a venography which showed patent central veins (Fig. 2). Under fluoroscopy guidance, the dilator directed the wire properly through the central veins to the right atrium (Fig. 3).

Figure 1

Figure 1: The guide wire is inserted through right internal jugular vein and misplaced in left internal jugular vein.

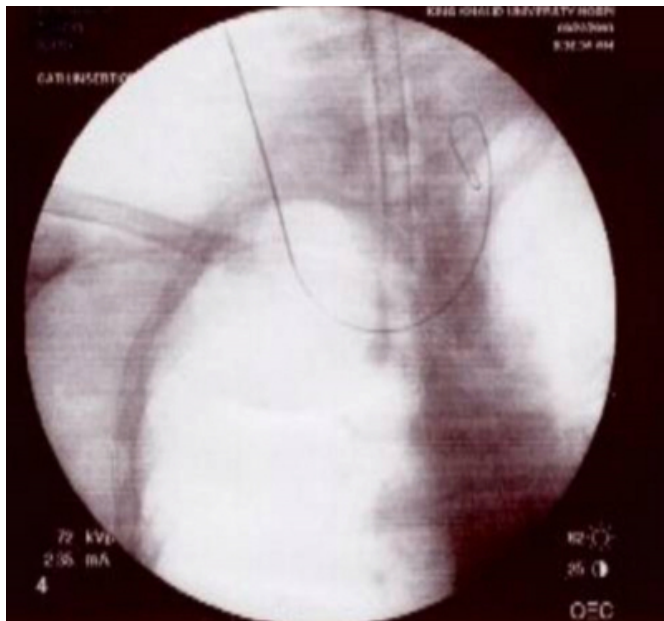


Figure 2

Figure 2: Venography showed patent ipsilateral right innominate vein and superior vena cava.

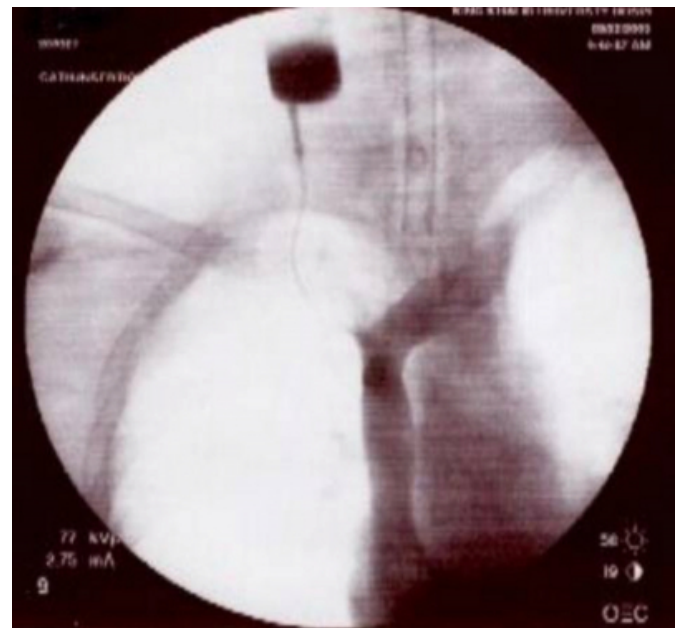
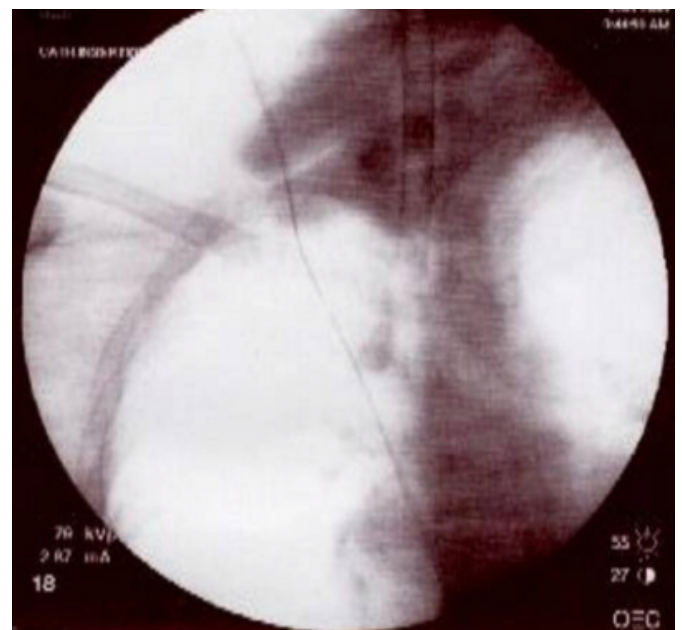


Figure 3

Figure 3: Under fluoroscopy guide, the wire was directed properly down to right atrium.



CASE 2:

After withdrawing and advancing the wire twice under fluoroscopic guidance it was seen in the right axillary vein where it stopped (Fig. 4). Again, according to our technique, venography was done to rule out any central vein obstruction followed by using a dilator to direct the wire toward the right

atrium (Fig. 5).

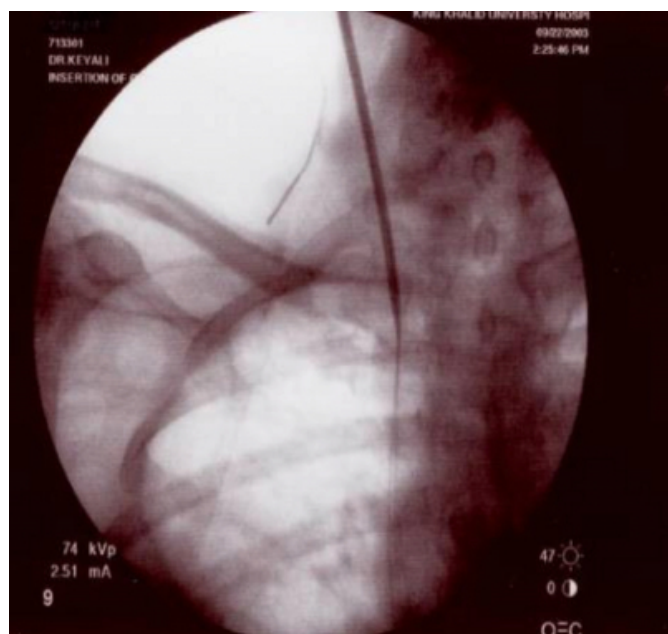
Figure 4

Figure 4: The guide wire misplaced in right axillary vein.



Figure 5

Figure 5: Using the dilator as a guiding catheter, the wire correctly placed in right atrium under fluoroscopy guide.



CASE 3:

The wire went easily downward for a short distance till origin of right innominate vein where it stopped. Venography showed tight stenosis in the same vein. Accordingly, the catheter was inserted through the left IJV

which was patent.

DISCUSSION

Percutaneous IJV cannulation is increasingly used in haemodialysis patient.⁸ Sometimes, the physician inserts the percutaneous permcath in the clinical ward with subsequent chest x-ray to show the position of the catheter tip.²

Our policy is to insert the central venous catheter in the operating room under fluoroscopy guide. It helps to identify the improper passage of the wire. To avoid this complication, our technique is to do (though a cannula) a venography to rule-out central vein stenosis or obstruction. Then, the dilator in the same permcath set is used as guiding catheter to direct the wire toward the right atrium (as shown in cases 1 and 2).

If venography showed occlusion or tight stenosis of the ipsilateral innominate vein, the permcath was inserted through the other patent central vein left innominate vein (as in case 3).

Our technique - applying a cannula over the wire to obtain venography followed by using the dilator as a guiding catheter under fluoroscopy - is a safe method to be used in difficult cases of permcath insertion.

CORRESPONDENCE TO

Dr. Abdulrahman El-Kayali, FRCS, MD
Assistant Professor & Consultant Vascular Surgeon
Division of Vascular Surgery
Department of Surgery (37)
King Saud University
College of Medicine
P.O. Box 7805, Riyadh 11472
Saudi Arabia
Fax No. 966 1 467-9493
Tel No. 966 1 467-1575

References

1. Kumwenda MJ. Two different techniques and outcomes for insertion of long-term tunnelled haemodialysis catheters. *Nephrol Dial Transplant* 1997; 12: 1013-1016.
2. Kumwenda MJ, Wright FK, Haybittle DJ. Prospective study of percutaneous jugular venous catheters for long-term haemodialysis catheters. *Nephrol Dial Transplant* 1996; 11: 913-914.
3. Konner K. Subclavian haemodialysis access: Is it still justifiable in 1995? *Nephrol Dial Transplant* 1996; 10: 1988-1991.
4. Gibson GP, Mosquera D. Five years experience with Quinton permcath for vascular access. *Nephrol Dial Transplant* 1991; 6: 269-274.

5. Twardowski ZJ. Advantages and limits of jugular catheter approach. *Nephrol Dial Transplant* 1995; 10: 2178-2182.
6. Uldall R, De Bruyne M, Besley M, McMillian J, Simons M, Francoeur R. A new vascular access catheter for haemodialysis. *Am J Kidney Dis* 1993; 21: 270-277.
7. Gray RR. Radiologic placement of indwelling central venous lines for dialysis, TPN and chemotherapy. *J Intervent Radiol* 1991; 6: 133-44.
8. McDowell DE, Moss AH, Vasilakis C, Bell R, Pillai L. Percutaneous placed dual-lumen silicone catheters for long-term haemodialysis. *Am Surg* 1993; 59: 569-573.

Author Information

Abdulrahman El-Kayali, FRCS, MD

Assistant Professor & Consultant Vascular Surgeon, Department of Surgery , Division of Vascular Surgery, King Saud University