

A Retained Guide Wire Following Hemodialysis Dialysis Catheter Insertion; Ultrasound Guided Localization and Retrieval: A Case Report

Bimlesh Shah¹, Shirish Silwal², Nisha Khadka³, Bidur Kumar Baral⁴, Rabi Raman Neupane⁵

¹ Department of Anaesthesiology, Bir Hospital, Kathmandu, Nepal

² Department of Anaesthesiology, Bharatpur hospital, Chitwan, Nepal

³ Department of Obstetrics, Nepal Army Institute of Health Sciences, Bhandarkhal, Syanobharyang, Kathmandu, Nepal

⁴ Department of Anesthesiology, National Academy of Medical Sciences, Bir Hospital, Mahabauddha, Kathmandu, Nepal

⁵ Department of Anaesthesiology, Matri Sishu Miteri Hospital, Pokhara, Nepal

How to Cite this Article (Vancouver Style)

Shah B, Silwal S, Khadka N, Baral BK, Neupane RR. A Retained Guide Wire Following Hemodialysis Dialysis Catheter Insertion; Ultrasound Guided Localization and Retrieval: A Case Report. Med J Ins Sc Tech. 2026;1(1):38–42. DOI: <https://doi.org/10.68003/mjiosat.v1i12>.

Abstract

Introduction: Central venous catheterization with the use of Sheldinger technique is a commonly carried out procedure for hemodialysis, medication and monitoring. Migration of guide wire or retained guide wire is a rare and preventable complication of the procedure. This case report brings light on a case of retained guide wire following hemodialysis catheter insertion and its removal by using ultrasound for localisation of guide wire and thereby giving skin incision.

Case summary: Twentyfive years old male, with history of chronic kidney disease and hypertension, taking Amlodipine 10 mg and Torsemide 20 mg presenting with shortness of breath and bilateral limb swelling undergone emergency haemodialysis after insertion of hemodialysis catheter insertion in right internal jugular vein by Seldinger technique under ultrasonography guidance. On the following day, a neglected guide wire was located at the right common iliac vein in check x-ray. With the use of realtime ultrasound curvilinear and linear probe, skin incision was given and dialysis catheter was removed successfully. The procedure was done under general anaesthesia following standard techniques.

Conclusion: Retained guide wire during central venous catheterization is a preventable complication and special care should be given to avoid it. But if an event occurs, point of care ultrasound can be used as a simple and effective way to locate skin incision site and assist the surgeon for the removal of the retained guidewire.

Key words: Retained guide wire, central venous catheterization, ultrasound, dialysis.

Article identifiers

eISSN: 3149-7497

Article ID: MJIOSAT-v1i1.a01

Pages: 39-43

DOI: 10.68003/mjiosat.v1i12



Scan to Access

Article History

Received: October 15, 2025

Revised: January 2, 2026

Acceptance: January 30, 2026

Published: April 30, 2026

Corresponding Author

Dr. Bimlesh Shah

Department of Anaesthesiology, Bir Hospital, Kathmandu, Nepal

Email: bimlesh909@gmail.com

ORCID ID: [0009-0009-8048-9945](https://orcid.org/0009-0009-8048-9945)

Introduction

Pneumothorax, arterial puncture and cardiac ectopy are the most common immediate complications of dialysis catheter insertion for hemodialysis.¹ Migration of guide wire into the circulation during insertion is a rare complication and can occur in the form of complete or broken guide wire migration. Complications like vascular/ tissue damage, thrombosis, embolism and arrhythmias are the potential complications caused by intravascular migration of a broken guide wire whereas complete guide wire commonly

remains asymptomatic and remains unnoticed for certain period of time.^{2,3} This complication is rare but is an entirely a preventable complication. Factors that contribute to loss of guide wire into circulation include inexperienced operators, lack of supervision, and inattention.⁴ Here, in this case report we describe a case of retained guide wire following hemodialysis catheter insertion and its removal by using ultrasound for localisation of guide wire and thereby giving skin incision.

Case Summary

Twenty five years old male with a history of Chronic Kidney Disease and hypertension, taking Amlodipine 10 mg, Torsemide 20 mg per orally since 2 months. He presented to the emergency department of Bir hospital complaining of shortness of breath and bilateral limb swelling for 6 days. There was no urine output for 8 days and he has a history of decreased urine output since 4 months. The patient was diagnosed with chronic kidney disease and hypertension 2 months back and started on medications as described earlier. There was no family history of kidney disease, hypertension, bleeding disorders. The patient was agitated, bilateral pitting edema on bilateral lower limbs, pallor, heart rate 96 bpm, blood pressure 150/90 mmHg and respiratory rate 24 breaths/min was noted during general examination. Bilateral decreased air entry present in bilateral basal areas of lungs and other systemic examinations were within normal limits. His hemoglobin was 8.3 gm/dl, urea 357 mg/dl, creatinine 21 mg/dl, chest xray showed bilateral pleural effusions and other investigations were within normal limit. The patient was then advised for urgent renal replacement therapy and 12 Fr double lumen dialysis catheters were inserted in the right internal jugular vein under USG guidance via Seldinger technique. Emergency dialysis was done for 2 hours with ultrafiltrate of 2000 ml which improved the patient's symptoms. On the next morning, Chest x-ray was done which visualized that the guide wire of dialysis catheter was in-situ tracking through inferior vena cava which was neglected and retained (Figure 1). Further x-ray pelvis revealed the J shaped end of the guide wire located at the right common iliac vein at the level of 3rd sacral vertebrae (Figure 2). USG abdomen and pelvis visualized linear echogenic structure in inferior vena cava and right common iliac vein with no obstruction consistent with guide wire inserted (Figure 3).



Figure 1: Chest X-ray showing retained guide wire



Figure 2: X-ray pelvis showing retained guide wire in common iliac vein



Figure 3: USG localising guide wire

The patient was planned for emergency exploration and removal of guide wire under general anesthesia. Preanesthetic checkup was done and the patient shifted to the operating room. Standard ASA monitors attached included HR, spo2, ECG and invasive blood pressure monitoring through right radial artery cannulation. Initial baseline vital parameters were BP 180/100 mmHg, Spo2 93 % in room air, heart rate 102 bpm and respiratory rate 20 breaths/minute. The patient was pre oxygenated. The patient was induced with fentanyl 100 mcg, propofol 80 mg and atracurium 25 mg iv was given. Xylocard 60 mg iv was given for blunting hemodynamic response during intubation. After 4 minutes, the patient's trachea was secured with the use of a 7.5 mm (Medtronic Limited, Watford, United Kingdom) tracheal tube. Tracheal intubation was confirmed by end tidal co2 monitoring, bilateral chest rise and equal air entry on auscultation.



Figure 4: Intraoperative localisation of guide wire

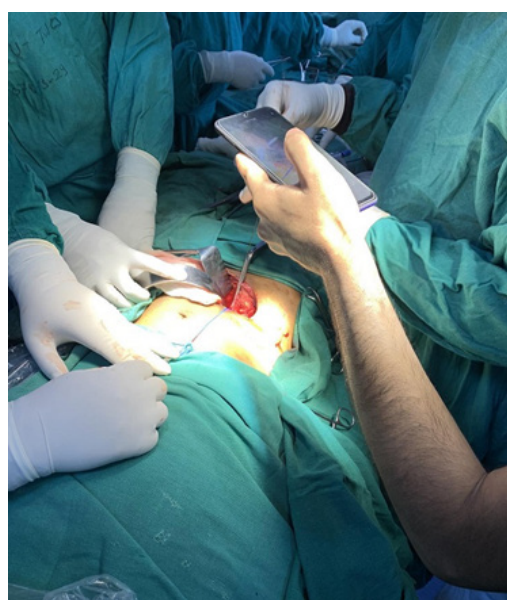


Figure 5: Clamping and removal of guidewire through skin incision



Figure 6: Removed guide wire

Dialysis catheter guide wire was located using ultrasound curvilinear probe 8-3 MHz (SonoSite X-Porte, C35xp probe) and marked. Skin incision was given in the right inguinal region. Right common iliac vein was visualized which was then submerged with normal saline and ultrasonography was done using linear probe 13-6 MHz (SonoSite X-Porte, HFL38xp probe) using sterile technique and incision site was marked just above right common iliac vein. With the help of intraoperative USG through the incision site, j-shaped end of the tip guide wire was located (Figure 4,5). Incision was given over the right common iliac vein after applying vascular clamp proximal and distal to the incision site. Dialysis catheter guide wire was removed successfully. On measurement it was 40 cm long (Figure 6).

For maintenance of anesthesia, isoflurane, oxygen and atracurium were used. Paracetamol 1 gram iv was given. For intraoperative rise in blood pressure bolus doses of Inj Nitroglycerine 50 mcg iv once. After completion of the surgery, the patient was extubated using neostigmine 2.5mg iv and glycopyrrolate 0.4 mg iv. The duration of surgery was 60 minutes with total blood loss around 50ml. The patient was then shifted to the post operative room. His vitals were stable. The patient was shifted to the general ward on the next day.

Discussion

Central venous catheterization (CVC) is a commonly used route for hemodialysis, intravenous medications, parenteral nutrition, hemodynamics monitoring, plasmapheresis, etc. The most common method used for placing a CVC is by the Seldinger technique. This technique involves insertion of guidewire through the hub of the needle, removing the needle followed by advancement of the catheter until the guidewire comes out of the catheter and advancing the catheter into the vessel wall and removing the guidewire.⁵ Although rare, guidewire retention is a rare but serious complication leading to increased risks of infection, embolization, cardiac perforation, and endocarditis after placement of central venous catheter insertion.⁶ Percutaneous retrieval under fluoroscopic guidance is commonly practiced method for retrieval of retained guidewire but other methods that can be used are surgical exploration of soft tissues and vessels, cardiac surgery with sternotomy, laparoscopy assisted, combined percutaneous and surgical intervention and ultrasonography guided removal.⁷

In this case, complete guide wire was lost into the circulation and was found in the right common iliac vein which was identified from chest x-ray and x-ray abdomen. We used realtime ultrasonography with a curvilinear probe to locate skin incision site and linear probe to locate the guide wire directly over the right common iliac vein to assist the surgeon for the removal of the retained guidewire. Use of CT scan, fluoroscopy and x-ray has been used mostly for removal of such retained guide wire but poses the risk of increased radiation exposure to the patient and healthcare

workers and more tissue damage as such procedure only give rough idea about position of guidewire but many times require meticulous surgical exploration.⁸ In contrast, use of real time continuous ultrasonography helps to localize the exact incision site, decreased trauma to surrounding tissues as need of exploration is reduced, decreased duration of procedure time, and absence of radiation exposure to the healthcare workers and patient. Also, use of ultrasonography is a rapidly emerging technology and its incorporation into point of care provides portability, higher successful rates due to improved imaging technologies and cost effectiveness.⁹

Retention of guide wire is included in endorsed list of 27 "serious reportable events" in the National Quality Forum (United States) that should be reported and investigated by all healthcare facilities when it occurs. However, the best way is to prevent it and following precautions should be followed.^{6,7}

- Continuous undivided attention to be given during the procedure by the operator.
- Trainees should carry out the procedure under supervision.
- Defects in the wire should be inspected before insertion.
- Consideration of guide wire as a delicate and fragile instrument.
- While insertion when resistance is met, removal and

inspection of the wire for damage should be done followed by repositioning the introducer so that no resistance to passage is felt.

- Inspection of wire and replacement if necessary should be done if multiple manipulations are needed.
- Advancement of guide wire about 20 cm only into the vein.
- Catheter should be passed over wire into the vein.
- Wire should be visible at the proximal end, before the catheter is advanced.
- Holding the guide wire throughout the procedure and railroading the catheter through it.
- Catheter and wire should not be pushed together into the vein.
- Inspection of the guide wire for complete removal at the end of procedure.
- Instrument count along with guide wire and verbal check can be done at the end of procedure.

Thus, we can conclude that retained guide wire during central venous catheterization is a preventable complication and protocol with proper checklist with supervision should be used to avoid it. But if an event occurs, point of care ultrasound can be used as a simple and effective way to remove retained guidewire.

Integrity and compliance statements

Ethics approval

It's a simple case report so no ethical approvals taken

Informed consent

This study used secondary data and it was not applicable

Source of Funding

The authors did not receive any specific funding for this research.

Conflict of Interest

The authors declare no conflicts of interest.

Data availability

No datasets were generated or analyzed for this study.

Provenance and Peer Review

Not commissioned; externally peer reviewed. Double-blind peer review.

AI/LLM disclosure

No AI-assisted tools were used in this manuscript.

License

© The Author(s) 2026. This work is licensed under a Creative Commons Attribution 4.0 International License ([CC BY 4.0](https://creativecommons.org/licenses/by/4.0/)).

Acknowledgements

The authors would like to thank all the study participants of the study.

Author Contributions (CRediT)

Bimlesh Shah: corresponding author, conceptualization, validation, writing-original draft, reviewing and editing.

Shirish Silwal: supervision, writing- reviewing and editing, validation.

Nisha Khadka: Visualization, resources and literature review, reviewing and editing

Bidur Kumar Baral: Supervision, reviewing and editing, investigation.

Rabi Raman Neupane: writing-original draft, resources.

Bios

References

1. Schummer W, Schummer C, Gaser E, Bartunek R. Loss of the guide wire: Mishap or blunder? *Br J Anaesth.* 2002;88(1):144-146. DOI: [10.1093/bja/88.1.144](https://doi.org/10.1093/bja/88.1.144) PMID: 11881872
2. Abuhasna S, Abdallah D, Ur Rahman M. The forgotten guide wire: A rare complication of hemodialysis catheter insertion. *J Clin Imaging Sci.* 2011;1(1):2-4. DOI: [10.4103/2156-7514.83397](https://doi.org/10.4103/2156-7514.83397) PMID: 21966636 PMCID: PMC3177414
3. Tong MKH. Misplacement of a right internal jugular vein hemodialysis catheter into the mediastinum. *Hong Kong Med J* 2004;10:135-8.
4. Cheung ME, Mellert LT, Firstenberg MS. Bedside Procedure: Retained Central Venous Catheter [Internet]. *Vignettes in Patient Safety - Volume 2.* InTech; 2018. DOI: [10.5772/intechopen.69748](https://doi.org/10.5772/intechopen.69748)
5. Williams Tamara L., Bowdle T. Andrew, Winters Bradford D., Pavkovic Stephen D., Szekendi Marilyn K. Guidewires unintentionally retained during central venous catheterization *Journal of the Association for Vascular Access.* 2014;19(1) DOI: [10.1016/j.java.2013.12.001](https://doi.org/10.1016/j.java.2013.12.001)
6. Bahreini M, Jalali A, Abdollahi A, Anzali BC. A Devastating Complication of Central Venous Catheter Insertion. *J Acute Med.* 2019 Jun 1;9(2):69-72. DOI: [10.6705/j.jacme.201906_9\(2\).0005](https://doi.org/10.6705/j.jacme.201906_9(2).0005) PMID: 32995234; PMCID: PMC7440382
7. Pokharel K, Biswas BK, Tripathi M, Subedi A. Missed Central Venous Guide Wires: A Systematic Analysis of Published Case Reports. *Crit Care Med.* 2015 Aug;43(8):1745-56. DOI: [10.1097/CCM.0000000000001012](https://doi.org/10.1097/CCM.0000000000001012) PMID: 25860201
8. Cross, Sarah J. Linker, Kay E. Leslie FM. HHS Public Access Author manuscript *Arch Intern Med.* Author manuscript; available in PMC 2015 November 06. Published in final edited form as: *Arch Intern Med.* 2009 December 14; 169(22): 2078-2086. DOI: [10.1001/archinternmed.2009.427](https://doi.org/10.1001/archinternmed.2009.427)
9. Radiation Dose Associa. *Physiol Behav.* 2016;176(1):100-106. DOI: [10.1001/archinternmed.2009.427](https://doi.org/10.1001/archinternmed.2009.427).
10. Radiation, Wilson S, Mackay A. Ultrasound in critical care. *Contin Educ Anaesthesia, Crit Care Pain.* 2012;12(4):190-194. DOI: [10.1093/bjaceaccp/mks019](https://doi.org/10.1093/bjaceaccp/mks019) PMCID: PMC10515965