Case Report
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Management of a Case of Partially Retained Guidewire after Right Internal Jugular Vein Tunnelled Catheter Insertion

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Abstract

Owing to the increased incidence of patients with Chronic Kidney Disease (CKD), maintenance haemodialysis becomes an integral part of the management of these patients. Vascular access in these patients is challenging and the use of Tunnelled Central Venous Catheters (tCVCs) is extremely common. Iatrogenic complications like loss of guidewires during the procedure are completely avoidable and necessary precautions have to be taken to prevent this. However, if such a complication prevails, adequate and prompt management of removal of guidewire has to be undertaken.

Keywords: Central Venous Catheters, Guidewires, Interventional radiology, Renal Insufficiency

1. Introduction

Haemodialysis (HD) remains the mainstay management of CKD patients. Although the creation of Arteriovenous Fistulas (AVF) would be a more viable option in patients undergoing maintenance HD, the time taken for its maturity, non-functionality after some time and haemodynamic consequences warrants the need for an alternative vascular access. tCVCs come a close second in terms of vascular access. HD using a catheter is extremely common[1]. The preferred site for insertion of tCVCs is the right Internal Jugular Vein (IJV) followed by the left IJV, femoral, and subclavian veins in descending order of preference. Ease of insertion and their ability to provide vascular access for HD immediately and for months make it a popular choice for initiation of HD and also for maintenance of HD.

2. Case Report

A 43-year-old male patient - a known case of hypertension, diabetes mellitus and Ischemic Heart Disease (IHD) and post Percutaneous Transluminal Coronary Angioplasty (PTCA) had undergone renal transplant surgery in 2011 with his younger brother as donor but due to graft rejection related complications he was undergoing dialysis though AVF. Post PTCA his AVF was not functional and hence was planned for left IJV permanent catheter insertion. He was subjected to preoperative neck Doppler which did not show any evidence of thrombosis.

Intraoperatively, all standard anaesthesia monitors which included ECG, pulse oximeter, End Tidal Carbon-di-oxide ($ETCO_2$) monitoring, and blood pressure monitors were connected. Under strict aseptic precautions, left IJV access was sought for using Ultrasonography (USG). The left IJV was identified and the needle was inserted. A modified Seldinger technique was employed. With a single prick good backflow was obtained. After confirmation of backflow, the Terumo guidewire was threaded in with no resistance while passing the guidewire. Once the adequate length of the guidewire was passed, there was resistance noted while removing the needle. The needle along with the guidewire was removed from the puncture site. The guidewire

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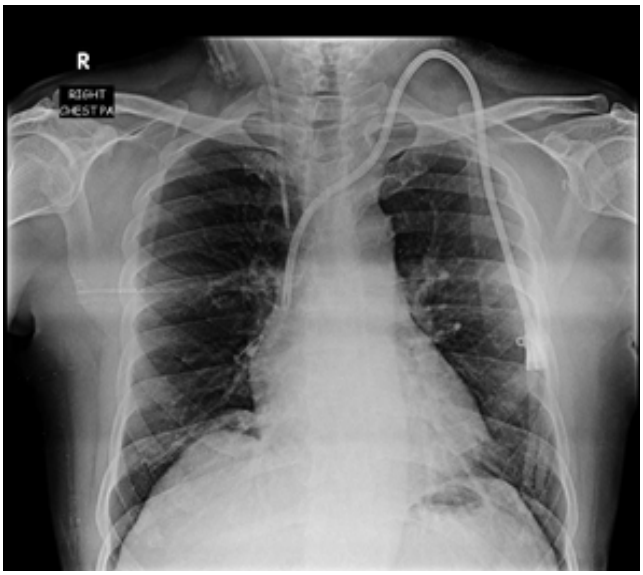

Figure 1. X-ray of chest showing retained guidewire.

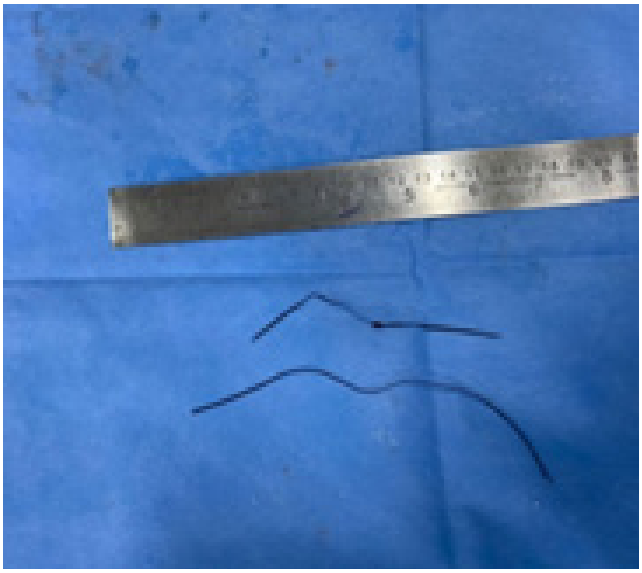

Figure 2. Removed piece of sheared guidewire.

was sheared and the needle was blocked allowing only unidirectional movement of the guidewire. With a new needle and guidewire, the left IJV was cannulated and the guidewire was passed. The intraoperative course of the patient was uneventful. The patient was hemodynamically stable. Confirmation of the position of the tCVC was done intraoperatively using C-Arm.

On postoperative day 1, the patient underwent haemodialysis uneventfully. The foreign body was noted in the chest X-ray following dialysis. High-Resolution Computerized Tomography (HRCT) was done to confirm the presence and location of the sheared guidewire (Figure 1). He was shifted to a setup which was well-equipped for interventional radiology and the foreign body was removed by an interventional radiologist (Figure 2). Subsequently, he was discharged with his vitals stable and a functional tCVC.

3. Discussion

Tunnelled CVC insertion provides easy and quick access to haemodialysis in patients with renal failure with failed arteriovenous fistula or at least 6 weeks after formation of a new AVF. These catheter insertions involve the use of guidewires. Guidewire-related complications include an array of conditions like infection, perforation of vessels, kinking and entanglement, cardiac dysrhythmias, fracture of guidewire[2], and complete loss of guidewire within the vascular system. Guidewire loss, although a rare occurrence, can occur from any of the vascular sites of venous catheterization. Patients could be completely asymptomatic following this or may present with perforation of the guidewires[3]. Guidewire fractures have been known to occur due to its inherent design flaws[4]. Shearing of the wire usually results from excessive force application while withdrawing the guidewires through the needle after it has passed the bevel. Hence, if a guidewire fails to pass freely from the introducer needle into the vessel, careful retraction of the wire through the needle is an option, but it is much safer to withdraw the wire and needle as a single unit[5]. Although rare, complete loss of guidewire into the circulation can occur from any of the mentioned sites. This is invariably associated with high mortality up to 20% [2]. There is an associated high burden of thromboembolic phenomena, especially in patients with renal failure who are already predisposed to increased thrombotic risk. Some case reports suggest that a complete guidewire may not necessarily produce any symptoms and it may remain unnoticed for a long period. Hence, there may be a delay in the diagnosis of a foreign body[6]. Gunduz *et al.*[7] have reported a case with the discovery of a foreign body as late as 17 months after the initial injury.

Recent advances in interventional radiological techniques are convenient and readily available for early retrieval of any foreign body[7,8]. In our case, the

patient was referred to an interventional radiologist and the foreign body was removed on an outpatient basis. Other techniques using angiography can be used for the removal of intravascular foreign bodies. However, the last resort is to remove the foreign body by surgical technique. Maintenance of a high degree of suspicion especially when the guidewire is sheared helped us in early diagnosis and removal of the foreign body.

4. Conclusion

Complications arising due to guidewire, although rare, are completely preventable. The high degree of suspicion of a retained foreign body has to be kept in mind if the integrity of the guidewire is not intact. Early diagnosis of complications can not only decrease the morbidity but also result in better long-term outcomes in these patients.

5. References

1. Abuhasna S, Abdallah D, Rahman M. The forgotten guide wire: A rare complication of hemodialysis catheter insertion. J Clinic Imaging Sci. 2011; 1:40. https://doi.org/10.4103/2156-7514.83397
2. Khasawneh FA, Smalligan RD. Guidewire-related complications during central venous catheter placement: A case report and review of the literature. Case Rep Crit Care. 2011; 2011:287261. https://doi.org/10.1155/2011/287261
3. Cho S, Yun S. Cut-down method for perm catheter insertion in patients with completely occluded internal jugular vein. Ann Surg Treat Res. 2019; 97(5):266-9. https://doi.org/10.4174/astr.2019.97.5.266
4. Joshi A, Muthe M, Firke V. An unusual case of a displaced hemodialysis catheter guidewire spontaneously coming out of skull. Indian J Crit Care Med. 2020; 24(6):480-2. https://doi.org/10.5005/jp-journals-10071-23462
5. Monaca E, Trojan S, Lynch J, Doehn M, Wappler F. Broken guide wire-a fault of design? Can J Anaesth. 2005; 52(8):801-4. https://doi.org/10.1007/BF03021773
6. Rani A, Malik PK, Report C. An avoidable iatrogenic complication. Indian J Crit Care Med. 2019; 23(8):382-3. https://doi.org/10.5005/jp-journals-10071-23225
7. Gunduz Y, Vatan MB, Osken A, Cakar MA. A delayed diagnosis of a retained guidewire during central venous catheterisation: A case report and review of the literature. BMJ Case Rep. 2012; 4-7. https://doi.org/10.1136/bcr-2012-007064
8. Can Sevil F. Successful percutaneous removal of retained J-tip guidewire: A report of two cases. Turk J Vasc Surg. 2020; 29(1):66-9. https://doi.org/10.9739/tjvs.2020.450