



A Special Checklist in Obstetrics Patient during Central Venous Catheter Insertion: Is it required?

Authors

Rajeev Chauhan¹, Deepanshu Dhiman², Gorsji Ujjwal³

¹MD Anaesthesia, DM (Neuroanaesthesia), Assistant Professor, Department of Anaesthesia, PGIMER Chandigarh-160012

²MD Anaesthesia, Senior Resident, Department Of Anaesthesia, PGIMER Chandigarh-160012
Email: panshu88@gmail.com, Phone no. 9646308822

³MD Radiology, Assistant Professor, Department of Radiodiagnosis, PGIMER Chandigarh-160012
Email: ujjwalgorsi@gmail.com, Phone no. 7087008568

Corresponding Author

Rajeev Chauhan MD, DM (Neuroanaesthesia)

Assistant Professor, Department of Anaesthesia, PGIMER Chandigarh-160012, India
Email: dr.rajeevchauhan@gmail.com, Phone no. 7087422950

Abstract

The central venous catheter insertion is routinely practice by almost all anesthetists. The complications associated with this procedure can at times turn into a sudden nightmare. In present day scenario the CVC insertion is aided by use of ultrasonography (USG). However, in certain situations like odd working hours, inattention, lack of expertise, hemodynamic instability, improper positioning, poor lighting etc. can lead to dreaded complications like loss of guide wire. This case was managed successfully following retrieval of guidewire percutaneously.

Keywords: Central venous catheter, guidewire, USG.

Introduction

Central venous catheter (CVC) insertion is one of the common procedures done in the emergency rooms and operation theatres. CVC insertion requires adequate training and supervision. The availability and use of USG in regular practice of CVC insertion has reduced the incidence of complications such as carotid puncture and accidental dilatation of carotid artery.¹The loss of guidewire into the blood vessel being cannulated is a rare complication of central line insertion and occurs when adherence to sequential steps of

insertion are not followed. The accidental loss of guidewire may also occur due to other factors like inattention during procedure, distraction, fatigue and inadequate supervision. Such incidences are generally under reported in literature, due to iatrogenic nature of the complication as well as fear of allegations of incompetence and negligence².

We report a case forgotten guidewire after insertion of CVC, which was later on detected during embolization procedure in DSA room. The

guidewire was retrieved through percutaneous procedure under radiological guidance.

Case Report

A thirty-two-year-old female with period of gestation 25wks- G₂ P₁₀₀ admitted under obstetrics and gynecology department of our institution with diagnosis of intra uterine death (IUD) with type II placenta praevia. The patient delivered the fetus spontaneously followed by delivery of placenta. Two hours following delivery, patient started having torrential bleeding and immediate management was started on the lines of post partum hemorrhage. Despite transfusion of blood products patient was still hemodynamically unstable, the anesthesia team was called at 2:00 am to guide further resuscitation. Despite volume resuscitation patient had persistent hypotension and plan was formulated to shift patient to operating room (OR) for exploration/hysterectomy. Presenting vitals were: pulse rate-164/min, blood pressure: 104/68 mm of Hg, saturation of 98% on FiO₂-0.6. Patient was administered 50 mcg fentanyl and 50 mg ketamine intravenously for sedation. The gynecologist performed examination under anaesthesia (EUA) and uterine cavity was packed for tamponade effect. In view of volume status assessment and possible requirement of ionotropes ultrasound guided CVC insertion of right IJV was planned. After insertion of CVC line by a trainee anesthetist under supervision of senior resident, free flow was confirmed in all the three ports and CVC was fixed at 12 cm. The uterine artery embolisation was planned and patient was shifted to interventional radiology suite. At 5:30 am fluoroscopy done during embolization revealed retained guidewire extending from IJV to IVC (Figure I and II).

There after patient underwent embolisation of uterine arteries and partial embolization of cervical arteries. A consensus was made for guidewire removal percutaneously under fluoroscopy by the interventional radiologist. The

relatives of the patient were informed and consent was taken regarding the procedure. The guidewire was successfully removed through the femoral vein using gooseneck snare (Figure III). Approximately two to three minutes after retrieval of the guide wire the electrocardiogram of the patient showed ventricular premature complexes (VPC's). Patient remained conscious, oriented, asymptomatic and hemodynamically stable. Injection xylocard was given i/v 60 mg and repeated after few minutes leading to transient resolution of abnormal rhythm obtained. After five minutes interval patient again had ventricular tachycardia intermittently. Injection amiodarone 150 mg bolus given, cardiology call was sent, arterial blood gas analysis was sent and 12 lead ECG was done. Arterial blood gas analysis showed potassium level of 2.7 mEq and slow infusion of KCl 40 mEq was started. Intravenous amiodarone infusion was started at a dose of 1mg/min and ventricular tachycardia resolved within a span of 30 minutes. Patient was monitored in the radiology suite for 60 minutes and then shifted to cardiac care unit (CCU) in view of constant monitoring for arrhythmias. The patient was discharged on day sixth of hospital stay.



Figure I: Antero posterior view during fluoroscopy showing presence of guidewire in IJV.



Figure II: Antero posterior view during fluoroscopy showing guidewire's abdomininal extension till L1 vertebral body.



Figure III: Retrieved intact guidewire following the procedure. .

Discussion

Seldinger described a simple, over a guidewire, approach for catheter insertion in 1953, which revolutionized the field of bedside procedures.³ The Seldinger technique is widely used in the intensive care unit (ICU) to place CVCs. Guidewire-related complications, when they do occur, they can be accompanied by significant morbidity and mortality.⁴ The inadvertent intravascular insertion of the entire guidewire, following the fundamental of holding on to the tip of the guidewire at all times can easily prevent further complications. The literature reports a number of other factors associated with the loss of guidewire which includes practitioner's inexperience in the Seldinger technique and lack of awareness about this complication. Guide wires were retained in spite of supervision which suggests a lack of

adequate close supervision or ineffective supervision during the procedure and which may have resulted due to of ongoing management of the patient can also be a contributory factor. Inattention and distraction during procedure due to requirement of quick completion of the CVC insertion procedure, high workload especially outside routine hours have been highlighted by other authors as a contributing factor.^{5,6} Odd working hours, not following Seldinger's technique, lack of close supervision and inattention during procedure due to the haemodynamic instability of the patient might result in loss of entire guidewire.

The guidewire removal percutaneously under radiological imaging has been reported as the most common procedure done to correct this complication.⁶ The retention of guidewire is associated with a number of complications such as retroperitoneal hematoma, gall bladder perforation, pulmonary embolism, vertebral artery thrombosis causing posterior cerebral infarction, ventricular perforation causing pericardial effusion, cardiac tamponade, palpitation and chest pain, infective endocarditis, intra-abdominal fluid collection causing sepsis, sternoclavicular abscess and lower limb thrombosis.⁶

Important **do's and dont's**:

1. Inspection of guidewire before insertion.
2. If resistance is encountered at any time removed the guidewire and do not flush the CVC.
3. If multiple manipulations are done re-inspect the guidewire.
4. Hold on to the distal part of guidewire all the time, adhere to not inserting the guidewire beyond 18-20 cm mark.⁶
5. Prompt reorganisation if the guidewire is lost.
6. Always inspect for complete removal of guidewire and document removal of guidewire in procedure notes.
7. Mandatory check X-ray following CVC placement.

8. Checklist to be maintained before and after the procedure.

Conclusion

The complications of CVC insertion can be taken care of and can be completely avoided following strict adhering to certain do's and don't's.

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