



## Intra-arterial migration of a blunt guidewire during femoral venous catheterization: a clinical case report

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### ABSTRACT

The use of a central venous catheter in an intensive care unit is a common practice. The femoral line is the emergency venous access of choice because it is quickly accessible and easily identifiable by the operator. However, the complications associated with this procedure remain quite considerable. The accidental migration of the guidewire during the Seldinger technique is exceptional but potentially dangerous complications given the risk of vascular and cardiac perforation. We report a rare case of an accidental intra-arterial femoral migration of a blunt guidewire when the venous central line passed mistakenly over the guidewire in the femoral artery. The removal of the guidewire by interventional radiology remains the solution of choice in such a situation, which could not be achieved due to the impossibility of moving the patient to radiology service because of her unstable hemodynamic conditions.

Keywords: central venous catheter, guidewire migration, complications, prevention.

### INTRODUCTION

A central venous catheterization is a frequent procedure. The femoral access line is the emergency venous access of choice when the placement of larger catheters is mandatory, particularly if superior vena cava access is unreachable. In fact, the femoral veins are quickly accessible and easily spotted by the operator, the puncture is therefore generally easy. However, the mechanical complications associated with this procedure and the failures remain quite considerable (5 to 19% of cases) [1]. In our observation, we report an accidental intravascular migration of blunt guidewire into femoral artery during central line insertion which is a rare complication of femoral vein catheterization.

## CASE REPORT

80-year-old female patient, who had a history of high blood pressure treated with calcium channel blockers and atrial fibrillation on vitamin K antagonist, she was initially admitted to the emergency department for brutal consciousness disorder, The clinical examination found a unconscious patient with a Glasgow coma scale of 6/15, an anisocoria, her hemodynamic and respiratory condition are stable, with a high blood pressure at 17/10 mmHg, SpO<sub>2</sub> at 96% without oxygen support.

Because of the evident neurological distress, she was immediately intubated, and ventilated, and a cerebral scanner without injection of contrast product was performed which had objectified the presence of an acute subdural hematoma, the coagulation tests had shown a prothrombin test at 24%, an INR at 6, thus the patient was immediately admitted to the operating room after having received antagonization by administration of 10 mg of vitamin k and transfusion of 10 units of fresh frozen plasma then she was transferred to intensive care for post-operative surveillance. After admission she presented a hemodynamic instability requiring the administration of vasoactive drugs, hence the decision to place a left femoral venous line, during the procedure the blunt guidewire slipped mistakenly inside when the central line passed over it and migrated into the femoral vessel. Standard chest X-ray (Figure 1) and abdominal X-ray showed an intra-aortic migration of the guidewire reaching the aortic arch (Figure 2). secondarily the vascular surgeon was contacted who decided to proceed to extraction of the guidewire as soon as her hemodynamic conditions became stable. The patient died a few hours later due to refractory shock.

## DISCUSSION

The use of a central venous line or femoral catheter in resuscitation is a common practice whose indications arise from difficulty to gain or maintain venous access peripherally. It allows invasive hemodynamic monitoring of central venous pressure (or even using a specific catheter, e.g., pulmonary artery catheterization), Delivery of certain medications or fluids – medications such as vasopressors (e.g., norepinephrine, vasopressin, phenylephrine etc.), chemotherapeutic agents, or hypertonic solutions are damaging to peripheral veins and often require placement of a central line. Additionally, catheters with multiple lumens can facilitate the delivery of several parenteral medications simultaneously. Prolonged intravenous therapies – parenteral medications that must be delivered for extended periods of time (more than a few days) such as long-term parenteral nutrition, or intravenous antibiotics are administered through a central line. [2]. However, this Procedure may be fraught with some immediate complications (pneumothorax, Misplacement, venous air embolism, arterial puncture, vascular perforation and hematoma) or delayed (thrombosis, Catheter-related bloodstream infections); but the migration of the guide into intravascular remains exceptional [3]. The first case of the literature was reported in 1996 by Akazawa et al [4].

The factors contributing to the migration of the guidewires are inattention, emergency, obesity, lack of operator experience or fatigue [5]. Removing the guide by conventional surgery or interventional radiology is an emergency. In fact, the presence of an intravascular guidewire may be complicated later by rhythm disorders caused by heart stimulation [6], embolic accidents, haemorrhagic accidents due to vascular perforation [7], and even the risk cardiac tamponade by myocardial perforation [8].

To minimize the risk of this complication, several rules must be followed. The procedure must be carried out by or under the supervision of an experienced operator, with a slow and careful progression of the catheter on the guidewire whose proximal end must always be visualized, not to push the catheter and guidewire at the same time, always check the removal of the guidewire during insertion of the central line, perform an X-ray to check the position of the catheter and the diagnosis of possible complications.

## CONCLUSION

Intravascular migration of the guidewire to a central venous catheter is a rare but potentially serious incident due to the complications it can cause. The management should be quick to avoid cardiac complications that may occur. Reducing the risk of this procedure can only be conceived by following the rules of catheter insertion. Finally, medical simulation is an effective tool for training young doctors and assessing their skills in order to avoid complications associated with the insertion of a central venous lines [9].



Figure 1: chest x-ray showing the guidewire in intra-aortic reaching the aortic arch



Figure 2: abdominal X-ray showing the guidewire along the abdominal aorta

## COMPETING INTERESTS

The authors declare that they have no competing interests.

## AUTHORS' CONTRIBUTIONS

all the authors contributed to the realization of this article, they read and approved the final manuscript.

## ACKNOWLEDGEMENTS

None

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