CASE REPORT

Forgotten guidewire presenting as femoral vein extrusion: A rare complication of central venous access

Tuba Betul Umit, Tugay Saricicek

Abstract

Central venous catheterisation (CVC) is a commonly performed procedure for critically ill patients in emergency departments (EDs). Here, we present the case of a rare complication of CVC involving a retained guidewire that was forgotten in the patient's vascular system and spontaneously extruded through the femoral vein 1.5 years later, prompting the patient to seek ED care.

Keywords: Central venous catheterisation, Guidewire, Femoral vein, Foreign body.

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Introduction

Central venous catheterisation (CVC) is a frequently performed procedure in emergency departments (EDs) and intensive care units (ICUs).[1] It is used for various purposes, such as fluid resuscitation, administration of vasopressors or long-term antibiotics, and total parenteral nutrition.[2] The most common complication associated with CVC placement is arterial puncture. Other complications include bleeding, phlebitis, cellulitis, haematoma, vascular perforation, arrhythmia, deep vein thrombosis, pulmonary embolism, pneumothorax, and haemothorax.[3-5] The frequency of these complications decreases when the procedure is performed by experienced practitioners. To reduce complications, the Seldinger technique[6] has been recommended since 1953.[2] Once the catheter is placed, the guidewire must always be removed from the body. Retention of a guidewire is a rare and undesirable complication, categorised as a "never event".[1,7] Retained guidewires can cause significant harm to the patient, including complications during retrieval and medico-legal issues.[1] However, approximately half of such patients remain asymptomatic.[1] This case report is aimed at highlighting the rare yet serious complication of guidewire retention during CVC placement.

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Case Report

A 12-year-old male presented to the Emergency Department of Haseki Training and Research Hospital, Turkey, on November 30, 2024, with a visible metallic foreign body protruding from the medial distal region of the right femoral area. His medical history revealed a diagnosis of type 1 diabetes mellitus. Radiographs of the affected area showed the foreign body extending along the femoral vein (Figure 1). Additional chest and abdominal

Figure-1: Radiograph and photograph of the patient. (a) Radiograph of the femur showing the wire extending outward at the level of the distal femoral vein near the knee. (b) photograph showing the foreign body, indicated by the yellow arrow, consistent with the guidewire.

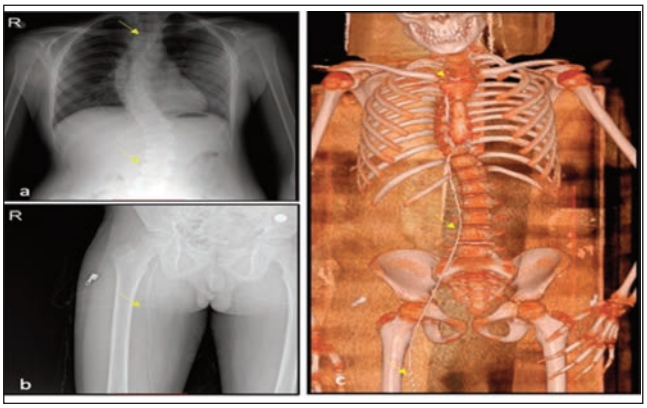

Figure-2: Radiograph and computed tomography (CT) images of the patient. Radiograph of the (a) chest and abdomen showing the foreign body extending up to the superior vena cava in the paravertebral area, (b) pelvis and femur showing it in the femoral vein. (c) Three-dimensional CT image showing the foreign body extending from the femoral vein to the superior vena cava, indicated by the yellow arrow, consistent with the guidewire.

radiographs revealed that it extended into the paravertebral plane up to the superior vena cava (Figure 2). The foreign body was identified as a guidewire used in CVC placement. Further inquiry revealed that the patient had been admitted to an ICU of another hospital 1.5 years earlier due to diabetic ketoacidosis, during which a CVC had been inserted via the right femoral vein. Upon examination, the patient's vital signs were stable, and blood tests were within normal limits. A review of the patient's medical records revealed that the guidewire had been visible in a chest radiograph taken during a prior hospital visit, but it had been overlooked. The patient was referred to cardiovascular surgery. A computed tomography (CT) scan of the chest and abdomen was requested to evaluate more accurately the structures adjacent to the guidewire. The retained guidewire was successfully removed percutaneously under local anaesthesia in the operating room of the same (Haseki Training and Research) hospital. No complications occurred.

Discussion

CVC placement is an essential part of patient care in the ED and ICU. Globally, the Seldinger technique, which uses a guidewire to facilitate catheter insertion, is the most commonly used method.[2,4] In the current case, the central venous catheter was inserted at a different hospital. Therefore, the specific procedural steps and post-procedure verification methods remain unclear. The retention of a CVC guidewire is a rare but serious complication that requires immediate removal upon detection.[1] Guidewire retention is typically identified either before the procedure is completed or within hours to days afterward.[1,8] In cases where blood cannot be aspirated during puncture or fluid administration is slow, the possibility of a retained guidewire should be considered.[1,2] While retained guidewires can cause significant harm, approximately half of the patients remain asymptomatic.[1] In rare cases, the guidewire may go undetected for months or years, often being incidentally discovered in radiographs obtained for unrelated reasons. The longest reported duration of a retained guidewire in the literature is 20 years.[1] Retained guidewires often migrate under the influence of factors like venous blood flow, gravity, patient movement, and positioning.[9] In the current case, the guidewire gradually migrated distally through the femoral vein, most likely due to the direction of venous flow and regular patient activity. Distal migration, as seen here, may result in delayed clinical recognition, whereas proximal migration can more rapidly lead to central complications or embolic event.

In countries such as the United Kingdom, national safety standards for invasive procedures (e.g., NatSSIPs) have been developed to reduce preventable errors.[10] Although no equivalent national protocol exists in Turkey, post-procedural bedside radiographs are considered standard practice in this institution following subclavian or jugular vein catheterisations—primarily to detect complications such as pneumothorax. These images are typically interpreted by the attending clinicians, and radiologist's input is sought when deemed necessary. Interestingly, despite such imaging practices, retained guidewires are often visible in post-procedural radiographs but may still go unnoticed by clinicians or radiologists. This "never event" is a serious and mostly preventable complication.[1,7,11] Underreporting is common due to fear of blame, medico-legal concerns, and the heavy workload of healthcare providers.

CVC placement should ideally be performed by experienced practitioners or under the supervision of skilled personnel during daytime hours, with adequate lighting and assistance.[1,3,12] The guidewire must be firmly held throughout the procedure and its removal should be verbally confirmed.[4] Post-procedure radiographs should be routinely obtained to evaluate potential complications. Any superimposing objects, such as echocardiography cables or feeding tubes, should be removed from the patient before imaging, to prevent missed detections of retained guidewires.[4] In cases of retained guidewires, systemic or human factors such as procedural urgency, staffing limitations, lack of supervision, or cognitive overload may have played a contributory role. The literature highlights that these conditions are particularly associated with guidewire retention when procedures are performed under high-stress circumstances or outside of regular working hours.[12]

If a retained guidewire is detected or incidentally noticed, it should be removed at the earliest opportunity. In most cases, percutaneous removal is sufficient, although surgical intervention may be required in some instances.[1] In the current case, the guidewire was detected 1.5 years later and successfully removed percutaneously without complications.

Conclusion

Guidewire retention is a completely preventable complication. This case report, aims to emphasise that even a simple and routine procedure such as CVC placement can lead to serious complications due to inexperience, negligence, or unfavourable conditions. Although it is often performed under urgent and challenging circumstances in critically ill patients, this procedure should be carried out under the supervision of experienced practitioners, to minimise complications.

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Author Contribution:

TBU: Concept, design, data collection, interpretation, drafting, critical revision, final approval and agreement to be accountable for all aspects of the work.

TS: Data analysis, interpretation, critical revision, final approval and agreement to be accountable for all aspects of the work.