Central venous catheters (CVCs) are essential for a significant number of patients and allow for intravenous administration of specific drugs, hemodialysis, continuous invasive hemodynamic monitoring, rapid fluid delivery when peripheral vein catheterization cannot be achieved, and parenteral nutrition. CVCs have been associated with a 14% to 15% adverse event rate; the most commonly reported complications include arterial injury, hematoma, pneumothorax, and related infections. Retained CVC guidewire after catheterization is a rare complication in the published reports and usually related with intra- or postoperative settings and jugular or subclavian vein. The present study reported a young female patient who underwent left femoral vein catheterization 6 months earlier in an intensive care unit of another hospital and was diagnosed with complete guidewire retention in the ED. To the best of the authors’ knowledge, this is the first case in published reports with a diagnosis of retained CVC guidewire with retrograde migration into the femoral vein. Surprisingly, the patient developed no thrombotic or embolic complication during this 6-month period.

Central venous catheters (CVCs) are often used for various purposes in the emergency departments (ED). The main uses of CVCs in the EDs are emergent hemodialysis, in situations where peripheral vein catheterization cannot be achieved, and continuous invasive hemodynamic monitoring. The complications related to CVC insertion are usually mechanical and observed in the near term after the procedure. Retained CVC guidewire after catheterization is a rare complication in the published reports and usually related with intra- or postoperative settings and jugular or subclavian vein. The present study reported a young female patient who underwent left femoral vein catheterization 6 months earlier in an intensive care unit of another hospital and was diagnosed with complete guidewire retention in the ED. To the best of the authors’ knowledge, this is the first case in published reports with a diagnosis of retained CVC guidewire with retrograde migration into the femoral vein. Surprisingly, the patient developed no thrombotic or embolic complication during this 6-month period.

CASE
A 23-year-old female patient was admitted to the ED with a complaint of the release of the end of a metallic wire from the nail bed of left big toe in the last 3–4 days. She had squeezed that region thinking it was a common acne. Then, she had seen a metallic wire end and pulled it thinking it was a needle. After she had pulled the wire somewhat, she was frightened and admitted to the ED. She had a medical history of type 1 diabetes mellitus and insulin use. The patient was admitted to the intensive care unit of another hospital with a diagnosis of diabetic ketoacidosis 6 months ago and, at that time, CVC was inserted into the left femoral vein because peripheral vascular access could not be provided. The patient was discharged after 3 days of hospital admission at that time. She denied any complaint since then. Physical examination revealed normal vital signs. Systemic examination revealed no pathologic lesion except a metallic wire hanging down from the left big toe (Figure 1). Anteroposterior (AP) and lateral x-rays of the left foot revealed a metallic wire extending along the tibia to the knee joint (Figure 2). Arterial and venous color Doppler ultrasonography of the left lower extremity did not reveal any thrombosis, occlusion, or stenosis. Laboratory evaluation did not reveal any abnormality. Because the patient was discharged from the previous hospital without any information related to the CVC procedure after the
case report

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when diabetic ketoacidosis treatment had ended, it was considered that the metallic wire was a guidewire forgotten during the CVC procedure performed at that time. Cardiovascular surgery was consulted, and the patient was admitted for surgical retrieval of the wire. The retained guidewire was removed from the popliteal vein after surgical exploration by a cardiovascular surgeon in the operating room. This surgical procedure revealed the retained guidewire in the anterior tibial vein with its proximal tip extending into the popliteal vein. The retained guidewire had a diameter of 0.038 inch and a length of 70 cm (ABLE; Guangdong Baihe Medical Technology Co., Ltd; Foshan, Guangdong, China). The patient was observed for 3 days because of the possibility of developing any complication, and on postoperative day 3, she was discharged with oral antibiotics.

DISCUSSION

Guidewires are universally used in the Seldinger technique that facilitates catheter placement into the vascular lumens during CVC placement.6 The most frequently used anatomical sites for CVC insertion are the internal jugular vein and the subclavian vein.2 The reported complications related to CVC insertion are more commonly associated with these vessels because the femoral vein is not preferred for vascular access. The complications of CVC generally include mechanical and immediate (arterial puncture, pneumothorax, cardiac tamponade, bleeding, catheter malposition, or nerve lesions), delayed (catheter migration, embolization), septic, and thrombotic complications.2,3,7 Mechanical complications are mainly operator dependent.8 Misplaced or retained guidewire during CVC placement is a rare complication and usually related with intra- or postoperative procedures in the operating room.1,4,5 Operator experience, fewer insertion attempts, and ultrasound guidance are factors associated with fewer mechanical complications. Surprisingly, the presented case had not developed any late complication despite a period of 6 months, and she is the first case of retention of a complete CVC guidewire in the femoral vein and migration of the wire into the foot retrogradely.

The retrograde movement of the guidewire in the opposite direction of the blood flow and working principles of venous valves was quite surprising and unexpected. We believed that the main cause of this retrograde movement of the guidewire was gravity. Furthermore, the patient was young and physically active. Daily physical activities and postures during the major part of the day, such as walking, standing, or jumping, may also cause this reverse migration.

In conclusion, even if retained guidewire during CVC placement is a rare clinical condition in the ED, it should be considered especially in patients who have a history of CVC insertion.
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