

Removal of the splitted guidewire forgotten during the treatment of varicose veins via radiofrequency ablation

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ABSTRACT

In recent years, classical surgery has been increasingly replaced by endovenous ablation techniques in the treatment of venous insufficiency with improved patient comfort. The guidewires used during invasive procedures may be forgotten in the intravascular area due to several reasons. Herein, we report a case in whom a guidewire forgotten during the radiofrequency ablation procedure and divided into two components and migrated to different localizations was removed. The components of the guidewire were removed using hybrid technique via jugular vein exploration and femoral vein percutaneous intervention.

Keywords: Guidewire; radiofrequency ablation; venous insufficiency.

Venous insufficiency is associated with complications which may lead to venous hypertension and ultimately loss of limb by venous ulcers by gradually progressing.^[1] In the treatment, minimal invasive techniques are predominantly preferred, as they can reduce the length of hospitalization and complication rates.^[2,3] In recent years, classical surgical treatments, such as stripping and high ligation, have given gradually place to less invasive treatment methods such as laser ablation, radiofrequency ablation, and glue.

The Seldinger technique is mostly used for percutaneous interventions or catheterization procedures, in which the guidewires are used. If a guidewire is forgotten in the intravascular area, it can be removed from the body by surgical exploration or percutaneous interventions. Herein, we report a case in whom a guidewire forgotten during the radiofrequency ablation procedure and divided into two components and migrated to different localizations was removed. The components of the guidewire were removed using hybrid technique via jugular vein exploration and femoral vein percutaneous intervention.

CASE REPORT

A 57-year-old female patient was operated at our clinic using radiofrequency ablation in May 2015 with the diagnosis of femorosaphenous insufficiency. In November 2016, the patient was admitted with dyspnea, chest pain, and significant electrocardiographic changes. Coronary angiography revealed a forgotten guidewire. In the fluoroscopic images, two wires were observed: the first wire extending from the right jugular vein to the skull base and the second wire folded from the subclavian vein inside the right atrium (Figure 1). Her medical history was non-specific. Physical examination findings were normal. The patient insistently reported that no interventional procedure was performed after varicose surgery. A written informed consent was obtained from the patient and she was operated in the hybrid operation room.

Under general anesthesia, the jugular vein was explored via the incision extending between the anterior side of the right sternocleidomastoid muscle and mastoid process-clavicle midline. It was observed

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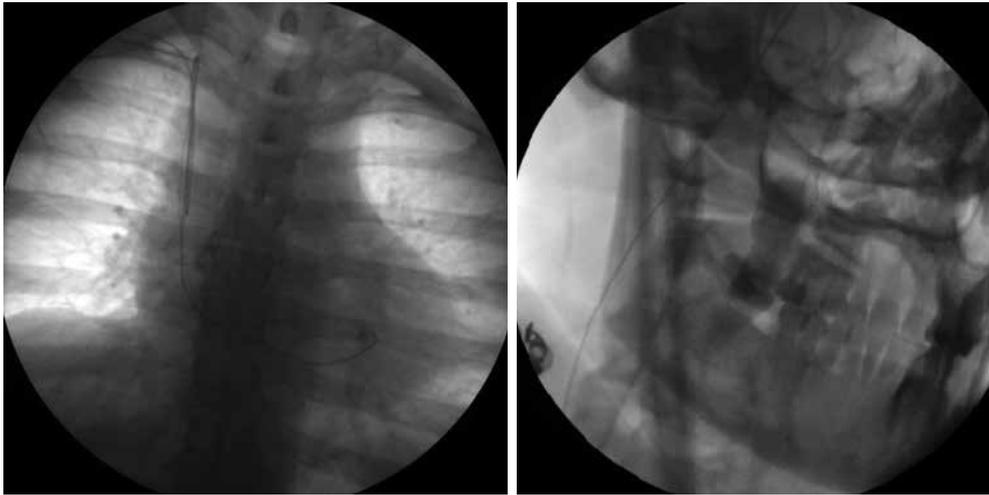


Figure 1. Angiography images of hard wire extending from right jugular vein to skull base and helical wire folded from subclavian vein inside right atrium.

that the hard wire was extravasated 2-cm toward to the posterior. The wire was released and removed between the muscles (Figure 2). Although the exploration toward the clavicle was continued, the second wire was unable to be reached. Therefore, right femoral



Figure 2. Removal of extravasated hard wire by right jugular vein exploration.



Figure 3. Removal of the second wire, caught in right atrium, from femoral vein.

vein percutaneous catheterization was applied from the inguinal region. Under the guidance of C-arm fluoroscopy, a catch wire was sent, and the second wire was caught in the right atrium and removed from the femoral vein (Figure 3). Examination of the retrieved wires showed that the carrier rough wire, which was broken into two components, and the elastic helical wire sections wrapped on it were separated from each other. After surgery, echocardiography and complete blood count were performed. The patient was discharged without any complication and with full recovery on the postoperative second day.

DISCUSSION

Guidewires are compulsorily used in many procedures using the Seldinger technique, such as insertion of a hemodialysis catheter, central venous catheterization, peripheral arterial interventions, and endovenous ablation therapy.

In this case, application of the guidewire was done for upper knee saphenous vein catheterization. Probably, the wire was not removed after the vein catheterization and, then, sent to the central veins by pushing the radiofrequency ablation catheter. It was interesting that, however, the entire guidewire was exposed to baro-mechanical impacts and body temperature in the venous system and it was divided into two components and its hard part was extravasated and extended to the skull base. Another possible reason is that, after the venous catheterization, the guidewire might have been broken by pushing or retracting the radiofrequency ablation catheter and tripping the helical portion of the wire.

The main reasons for forgetting a guidewire in the vascular area include carelessness, inexperience, hastiness, fatigue of the operator, and inadequate surveillance of an experienced operator.^[4] The risk factors for the complications in the intervention include poor interventional technique, poor quality of material used, body mass index more than 30 kg/m² and less than 20 kg/m², the presence of coagulopathy, the use of a wide-lumen catheter, and the selection of anatomic region.^[5] In the retrospective examination of our case, we found that the operator who performed the ablation procedure was not experienced enough at the time of this intervention.

Although guidewires forgotten do not always result in acute symptoms in most patients, complications such as thromboembolic events, sepsis, endocarditis, and arrhythmia due to prolonged stay of the foreign body inside the veins have been previously reported in the chronic period.^[6] In this case, there was no complaint caused by the wire. However, in the long-term, it was decided to remove the wire for possible development of aforementioned complications and to prevent the patient to live with the psychology of having a foreign body inside.

Owing to the high comfort for the patient, percutaneous interventions are likely to replace most conventional surgical methods in the future. In the present case, in addition to exploration, a percutaneous intervention represents a good example in terms of the use of a catch wire under the guidance of fluoroscopy, as well as the hybrid procedure, and in favor of the treatment diversity diversification of the treatment.

In conclusion, in the clinical practice, control imaging methods are not used, unless there is a serious complication after the endovascular ablation

procedures. To prevent such complications, it is essential to visualize that the wire exits from the distal lumen before completely pushing the catheter over the guidewire inside the vein. A high-quality intraoperative communication should be maintained and the whole team must be familiar with the procedure. In addition, in all transcatheter applications, we recommend that all components of the catheter should be counted before and after the procedure through a safe surgical checklist.

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