



Should a forgotten guidewire be removed after years? An undesirable complication of hemodialysis catheter wire left in the body

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ARTICLE INFO

Article Type:
Case Report

Article History:

Received: 15 September 2023

Accepted: 5 November 2023

ePublished: 28 November 2023

Keywords:

Guidewire
Hemodialysis catheter
Seldinger technique
Cardiac surgery

ABSTRACT

Today, one of the most common methods used in the emergency room or intensive care unit (ICU) in patients is the Seldinger technique to access the central venous system, shunting for hemodialysis, intra-aortic balloon pump, or arterial insertion. Accidental leaving of the guide wire is an uncommon but important complication that can occur as a result of an incorrect technique, and it is sometimes found accidentally or due to complications years after the procedure. The case is a 53-year-old patient who underwent aortic valve replacement with a mechanical valve and mitral valve repair with a ring 12 years ago and was treated with warfarin. Two years after the heart surgery, due to chronic renal failure, the patient underwent dialysis, and after the preparation of an arteriovenous fistula, he underwent stenting. After approximately ten years, the patient developed fever, chills, and shortness of breath. During the examination, endocarditis was diagnosed, and a part of the aortic valve was released. There was a severe paravalvular leak in the aortic valve, and an abscess was formed in the aorta root. We also noticed a forgotten guide wire in the superior vena cava, right atrium, inferior vena cava, and hepatic vein, and echogenic masses were located on the guidewire. The diagnosis was confirmed by echocardiography, chest x-ray, and phenocopy. After antibiotic therapy, the patients underwent heart surgery, aortic valve replacement, and aortic root repair, and the guidewire was removed (70 cm long). Unfortunately, despite all measures, the patient died a few days after the surgery. Due to complications, a forgotten guidewire should be removed immediately after diagnosis. The preferred intervention is the removal of the guidewire by endovascular interventions, but surgical treatment should also be considered in some cases.

Implication for health policy/practice/research/medical education:

A forgotten guide wire should be removed immediately after diagnosis. The preferred intervention is the removal of the guidewire by endovascular interventions, but surgical treatment should also be considered in some cases.

Please cite this paper as: Hekmat M, Ghaderi H, Ansari Aval Z, Mirjafari SA, Tirdad R. Should a forgotten guidewire be removed after years? an undesirable complication of hemodialysis catheter wire left in the body. J Nephroarmacol. 2024;13(1):e11649. DOI: 10.34172/npi.2023.11649.

Introduction

The retention of the guidewire occurs where the Seldinger method is utilized, such as the installation of access to the central vein (CV line) (1) or the establishment of hemodialysis or artery line or intra-aortic balloon pump (2,3). These techniques are performed in intensive care unit (ICU) and cardiac surgery rooms, emergency departments, and often for ill patients.

Guidewire loss often occurs due to operator error and remains undisclosed due to fear and concerns about the consequences, and is usually discovered accidentally

after a long time (4) or after the development of related complications. Complications of guide wire loss include the migration of the guide wire to the pulmonary artery (5), guidewire knocking (6), a broken guidewire (7), arteriovenous fistula (8), and cerebral stroke (9). The guidewire can migrate to different places, such as from femoral to jugular (10), or infection and endocarditis (the presented case) (11,12).

The question is, if a guidewire is left without complications and found accidentally, should it be left on the site, or it should be removed?

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Case Report

A 53-year-old man presented with fever and chills commencing approximately two months previously. He had undergone heart surgery for an aortic valve replacement with a mechanical valve, the mitral valve was repaired with a ring 12 years ago, and he received warfarin. About two years after the heart surgery (10 years ago), he needed hemodialysis due to chronic renal failure, and he underwent stenting until the arterial-venous fistula in his hand was ready. Subsequently, in the follow-up echocardiography, the patient noticed an asymptomatic forgotten guidewire in the heart. Due to its asymptomatic character, the patient did not want to undergo another procedure and remove the guidewire. After about ten years, the patient developed fever and chills. In physical examination, we noticed endocarditis of the aortic valve, separation of parts of the artificial valve from the aortic ring, severe paravalvular leak in the aortic valve, and abscess formation in the aortic root. We also noticed a forgotten guidewire in the superior vena cava, and right atrium, looping in the right ventricle, inferior vena cava, and hepatic vein. Echogenic and mobile masses on the guide wire were detected by echocardiography, and the diagnosis was confirmed by fluoroscopy and chest X-ray (Figure 1).

After antibiotic treatment, he underwent heart surgery, aortic valve replacement was performed, and the aortic root was repaired.

Then the right atrium was opened, and the 70 cm long guide wire was removed (Figure 2).

The surgery was completed without any particular incident, although the measures taken, the patient died a few days after the surgery.



Figure 1. Guide wire diagnosis was confirmed by chest x-ray.



Figure 2. The 70 cm long guide wire was removed.

Discussion

Most of the cases of guidewire loss are caused by sufficient skills of the surgeon and not going through the learning curve enough (13). Sometimes, experienced people are responsible for this (14), and this occurs due to ignoring the recommended actions (15). During the insertion, those devices may be forgotten due to the operators' high self-confidence (13) or their high workload (14). Sometimes, forgotten or lost guidewire remains concealed lest be questioned by a superior (2) or a patient's legal complaint. Therefore, it usually remains concealed and is detected accidentally or due to complications.

In all cases, this incident can be prevented by keeping the end of the guide wire and leaving at least 18 cm from the end (2,13,14); and if this happens immediately, it can be removed with techniques on the bedside (3). If it is completely left inside the vessels, it should be removed by intravascular techniques (6).

There is no consensus on whether it should be removed through angiography, endovascular, or surgery. It is recommended that it should be removed first through endovascular angiography, and if this fails, then surgery should be considered (1,6).

In a study, 15 patients were subjected to intervention for foreign body removal for four years. In nine cases, foreign bodies were parts of central venous lead, three cases were remaining guidewire, two were pacemaker leads, and one case was coil displacement, all of which were removed by percutaneous interventions. Surgical removal should only be considered when these efforts fail or they are identified after a long time (1,6).

The question is, should a forgotten guidewire without complications be left or removed?

There are reports of guide wire migration in the body (5,10) or stroke in the brain (9), or the formation of a clot on it and sending an embolism or the development of endocarditis (the reported case). They can all endanger patients' lives. Therefore, the authors recommend that lost guide wires should be removed.

Conclusion

Instructing operators about the complications of loss of guide wire even after a while and ensuring and comforting can lead to the comprehension of complications and the expression of loss of guide wire, which can be done in the early stages and prevent later complications. Whenever a forgotten guide wire is found, it should be removed.

Acknowledgments

The authors would like to thank Modarres Hospital staff

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Conflicts of interest

The authors declare that they have no competing interests.

Ethical issues

This case report was conducted in accordance with the World Medical Association Declaration of Helsinki. Written informed consent was obtained from the patient for the publication of this case report. The authors have adhered to ethical standards, including avoiding plagiarism, data fabrication, and double publication.

Funding/Support

The authors declare that they did not receive any funding to complete this study.

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