Annals of Case Reports
Veach J and Rohr A. Ann Case Rep: 9: 101953
www.doi.org/10.29011/2574-7754.101953
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Case Report

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# Inferior Vena Cava (IVC) Filter Placement in Patient with Nickel Allergy

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**Citation**: Veach J, Rohr A (2024) Inferior Vena Cava (IVC) Filter Placement in Patient with Nickel Allergy. Ann Case Report. 9: 1953. DOI:10.29011/2574-7754.101953

**Received:** 25 August 2024, **Accepted:** 29 August 2024, **Published:** 02 September 2024

**Abstract**

This case report describes the successful placement of an Inferior Vena Cava (IVC) filter in a 68-year-old female patient with a known nickel allergy, who presented with a parafalcine subdural hematoma, multifocal pulmonary embolism (PE), and deep venous thrombosis (DVT). The management was complicated by the competing hemorrhagic and thrombotic pathologies occurring, necessitating multidisciplinary team coordination. After thorough discussion among specialists and with the patient, the decision was made to proceed with IVC filter placement due to the considerable risk of further thromboembolism. The procedure was carried out successfully without premedication, and no allergic reactions were observed post-procedure. The patient's condition remained stable, and follow-up imaging and lab work confirmed the efficacy of the IVC filter without evidence of hypersensitivity. This case demonstrates an interesting dilemma of having to use a relatively contraindicated device in a patient with a known allergy to its material. Given the limited literature available to guide medical management in such complex cases, sharing examples of outcomes like this is crucial for improving clinical practice.

**Keywords:** Inferior Vena Cava Filter; Nickel Allergy; Pulmonary Embolism.

## Introduction

A retrievable IVC filter containing nickel was placed in-patient with a known history of nickel allergy, which was medically necessary for continued protection from a mobile embolizing deep vein thrombus. The patient experienced no symptoms or signs of allergic reaction despite her known history of nickel allergy. Documentation of this case may help providers weigh risk/benefit profiles in complicated patients such as this. Additionally, a multidisciplinary approach proved vital for the care of this patient and is highly valuable in these tenuous situations.

## Case History/Examination:

A 68-year-old female presented to the emergency department after a ground-level fall, sustaining an injury to the back of her head. The patient was on Eliquis for atrial fibrillation. Upon examination, she appeared neurologically intact but had a posterior scalp laceration that required seven staples and two stitches. Initial imaging revealed a stable, thin, localized three mm left parafalcine subdural hematoma (Figure 1). The patient was admitted to the intensive care unit (ICU), where neurosurgery recommended head computed tomography (CT) scans every six hours, holding Eliquis, and administering Sentra to reverse its anticoagulant effects. The patient remained stable in the hospital with consistent

CT head imaging and was discharged the following day. Neurosurgery advised restarting Eliquis in two weeks. Four days after discharge, the patient returned with dyspnea, hypoxia, and chest pressure, reporting shortness of breath since her discharge. A CT angiography revealed acute multifocal pulmonary embolism, prompting hospital readmission (Figure 2). A heparin drip was initiated after CT demonstrated her subdural hematoma was stable. A subsequent ultrasound demonstrated lower extremity DVTs. IVC filter placement was then recommended.

## Methods

Discussions regarding the placement of an IVC filter revealed that the patient had a nickel allergy which causes itching, redness, and a rash when in contact with nickel-containing jewelry. This allergy is present in multiple family members. After hearing opinions from vascular surgery, interventional cardiology, and allergy subspecialists, it was agreed that the benefits of an IVC filter outweighed the risks of an allergic reaction. The patient understood the risks and agreed with the decision. The procedure was carried out without premedication to avoid masking any potential allergic reactions. An IVC filter was successfully placed, though an extended period was required to achieve hemostasis, necessitating a purse string suture (Figure 3). The patient reported soreness at the right neck site where the dressing was placed, but had no further complaints. Lab work did not indicate an allergic reaction, with all cell counts remaining stable. The patient restarted Eliquis one month after discharge. Two months later, an ultrasound confirmed residual thrombus in the femoral vein, leading to the decision to keep the IVC filter in place.

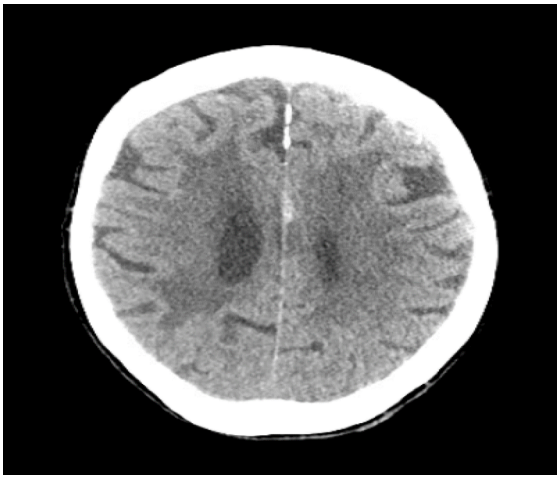

**Figure 1:** CT Head without contrast showing an acute trace left parafalcine subdural hematoma. No associated mass effect. There is moderate size left occipital calvarial contusion/hematoma without underlying calvarial fracture.

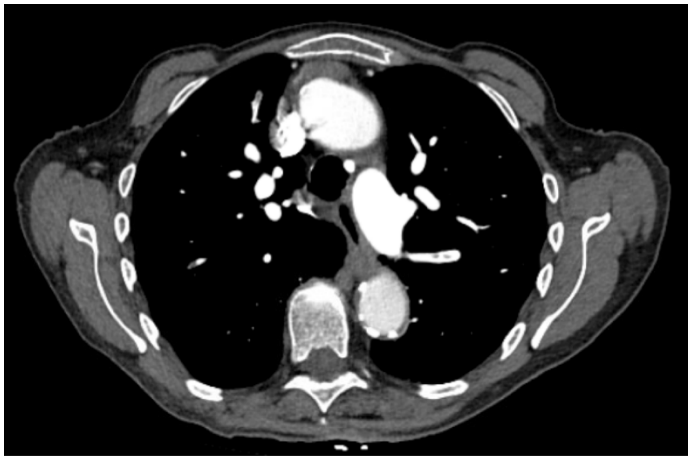

**Figure 2:** CTA Chest showing multifocal acute and new pulmonary thromboemboli with several areas of improved pulmonary thromboemboli and other old areas of thrombus. CT evidence of considerable right heart strain with RV/LV ratio calculated at 2.

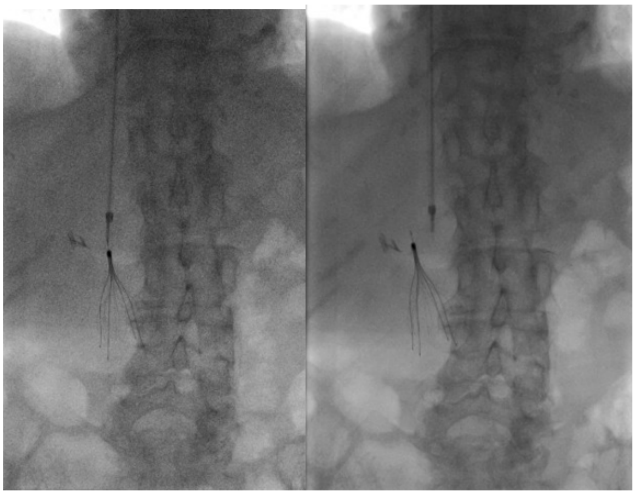

**Figure 3:** The inferior vena cava filter was deployed just below the lowest renal vein inflow without incident, as shown in this image.

## Conclusion and Result

This case illustrates the complexity of managing anticoagulation in a patient with both thrombotic and hemorrhagic risks. The decision to use an IVC filter was influenced by the multifocal nature of the DVT and the patient's lack of cardiopulmonary reserve. The successful interdisciplinary approach shows the importance of collaborative care in complex cases. Despite the limited long-term follow-up data of IVC filter placement in patients with nickel allergy, providers managing this patient determined the protective benefit of the IVC filter outweighed the risk of endothelial allergic

reaction. There was no appreciable hypersensitivity reaction following filter placement, despite the patient's history of allergic reactions to skin contact with nickel.

## Discussion

IVC filters are used to prevent emboli from traveling to pulmonary vasculature and causing pulmonary embolism (PE) in patients with contraindications to systemic anticoagulation [1]. Particularly in the case of a mobile femoral thrombus, the risk of PE developing is of great concern [2]. A study in 2015 evaluated mid- and long-term outcomes of patients with permanent IVC filters which showed that PEs were effectively prevented but venous thromboembolism (VTE) and post-thrombotic syndrome were common following the procedure [1]. They did not report any procedure or device-related mortality incidents. The typical complications associated with IVC filters have been studied and documented to include three categories: procedural, post-procedural, and retrieval [3]. In the randomized controlled PREPIC trial, the overall mortality benefit of placing an IVC filter was studied [4]. While the Journal of Vascular and Interventional Radiology recommends that patients with acute VTE and contraindication to anticoagulants should have an IVC filter placed, the literature fails to provide guidance on handling patients with a nickel allergy [5]. One case report documented an uneventful course of IVC filter placement in a patient with nickel hypersensitivity in 2014 [6]. Since all IVC filters contain nickel, continued documentation of placement in patients with a history of nickel allergy is necessary to help providers determine when the risk of reaction is worth placing a nickel-containing device.

**Ethical Considerations:** This case report does not require Institutional Review Board approval as it is not classified as a human research study by this institution. All identifying patient information has been anonymized, and there are no additional ethical concerns related to this case.

**Conflict of Interest:** The authors declare that there are no conflicts of interest regarding the publication of this report.

## References

1. Chow FC, Chan YC, Cheung GC, Cheng SW. (2015) Mid- and long-term outcome of patients with permanent inferior vena cava filters: a single center review. Ann Vasc Surg. 29:985-994.

2. Casian D, Gutsu E, Culiuc V. (2010) Extraluminal venous interruption for free-floating thrombus in the deep veins of lower limbs. Chirurgia (Bucur). 105:361-364.

3. Muneeb A, Dhamoon AS. (2023) Inferior Vena Cava Filter. In: StatPearls. Treasure Island (FL): StatPearls Publishing.

4. PREPIC Study Group. (2005) Eight-year follow-up of patients with permanent vena cava filters in the prevention of pulmonary embolism: the PREPIC (Prevention du Risque d'Embolie Pulmonaire par Interruption Cave) randomized study. Circulation. 112:416-422.

5. Kaufman JA, Barnes GD, Chaer RA, Cuschieri J, Eberhardt RT, et al. (2020) Society of Interventional Radiology Clinical Practice Guideline for Inferior Vena Cava Filters in the Treatment of Patients with Venous Thromboembolic Disease: Developed in collaboration with the American College of Cardiology, American College of Chest Physicians, American College of Surgeons Committee on Trauma, American Heart Association, Society for Vascular Surgery, and Society for Vascular Medicine. J Vasc Interv Radiol. 31:1529-1544.

6. Morshedi MM, Kinney TB. (2014) Nickel hypersensitivity in patients with inferior vena cava filters: case report and literature and MAUDE database review. J Vasc Interv Radiol. 25:1187-91.