

Migrating Foreign Body in the Heart

Anthony Lemaire¹, Raymond Kennedy¹, Hirohisa Ikegami¹, Manabu Takebe¹, Gengo Sunagawa¹, Mark J. Russo¹, Leonard Lee²

Review began 05/12/2022

Review ended 05/22/2022

Published 05/24/2022

© Copyright 2022

Lemaire et al. This is an open access article distributed under the terms of the Creative Commons Attribution License CC-BY 4.0., which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

1. Cardiac Surgery, Rutgers Robert Wood Johnson Medical School, New Brunswick, USA 2. Cardiothoracic Surgery, Robert Wood Johnson University Hospital, New Brunswick, USA

Corresponding author: Anthony Lemaire, anthony.lemaire@rwjms.rutgers.edu

Abstract

Foreign bodies in the heart are a rare condition and an exact mechanism for this occurrence has not been well described. These objects can reach the heart by direct penetration due to local trauma or through intravenous migration or may remain in the heart after medical procedures. The most common foreign bodies that reach the heart are bullets and shrapnel. The purpose of this study is to review a case where a patient injected himself with recreational drugs. The needle subsequently dislodged from the syringe and migrated into the heart.

Categories: Cardiac/Thoracic/Vascular Surgery, Cardiology, Anatomy

Keywords: device migration, catheter migration, right ventricle (rv), heart surgery, foreign bodies

Introduction

Migrating foreign bodies into the heart are a rare condition that has not been well reported. These objects can reach the heart by direct penetration due to trauma or through intravenous migration or after medical procedures. The most common foreign bodies that reach the heart are bullets and shrapnel. There are parts of catheters and needles that can reach the right heart by migration through the venous system. The main radiographic modalities for detecting foreign bodies in the heart are x-ray-based methods [1]. Additional imaging studies such as computerized tomography (CT) scans and echocardiography can provide more accurate details. The purpose of this study is to review a case where a patient injected himself with recreational drugs. The needle subsequently dislodged from the syringe and migrated into the heart.

Case Presentation

This is the case of a 32-year-old man with a history of intravenous drug abuse with recent use at 3 am on the day of admission. He reported using a 3-cm-long, 25-gauge needle to inject heroin into his right internal jugular vein. Upon injecting the syringe, the patient noticed that the needle was not present and retained in his neck. He presented to the emergency room and a CT scan of the chest showed a radiopaque object at the injection site, tracking medial to the right internal jugular vein (Figure 1). The patient was taken to the operating room by the vascular surgery team for attempted removal of the needle. Unfortunately, despite an aggressive exploration no needle was found. Additional imaging was ordered and a CT scan of the chest showed a foreign object in the heart.

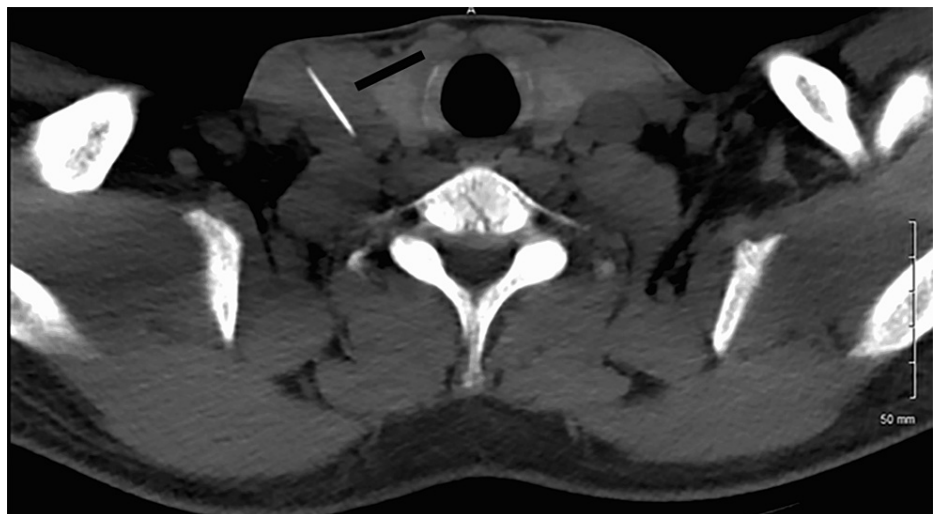


FIGURE 1: Needle within the right internal jugular vein in the neck.

How to cite this article

Lemaire A, Kennedy R, Ikegami H, et al. (May 24, 2022) Migrating Foreign Body in the Heart. Cureus 14(5): e25294. DOI 10.7759/cureus.25294

At this time, cardiothoracic surgery was consulted. After review of the CT scan of the chest and intraoperative transesophageal echocardiogram (Figure 2), which confirmed the needle in the heart, an exploration and removal of the needle was initiated. The needle was specifically identified in the right atrium within the septal leaflet of the tricuspid valve. There was no injury to the leaflet and no resulting valvular pathology. After a median sternotomy, the patient was placed on cardiopulmonary bypass with bicaval cannulation. The right atrium was opened, and the needle was clearly seen below the septal leaflet of the tricuspid valve (Figure 3). The needle was carefully removed with care to prevent injury to the tricuspid valve (Figure 4). The right atrium was then closed and the patient was taken off the cardiopulmonary bypass machine. He subsequently did well and was discharged home on postoperative day number 4. He returned to clinic and was doing well.

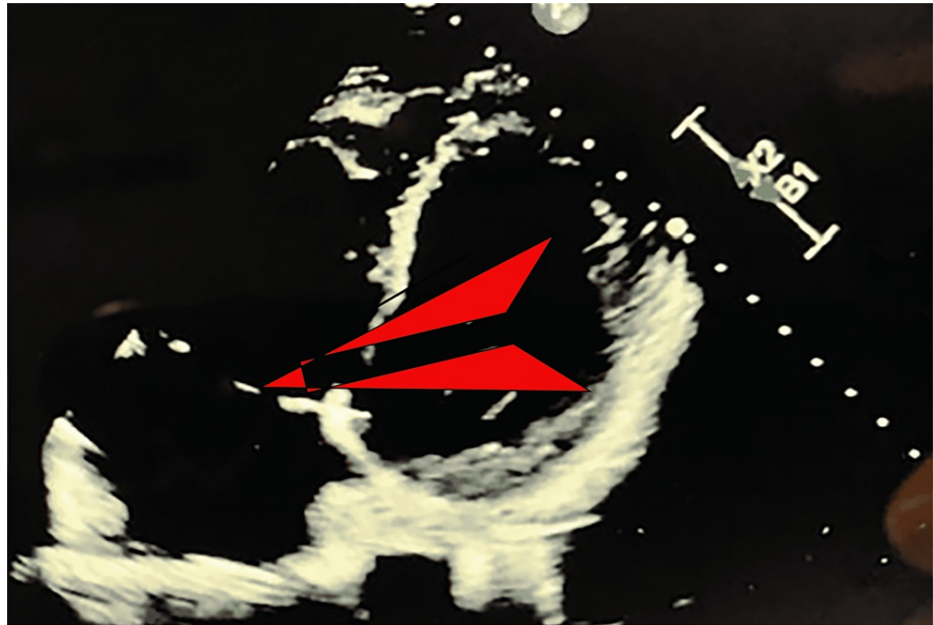


FIGURE 2: Dislodged needle below the tricuspid valve and imbedded in the interventricular septum.

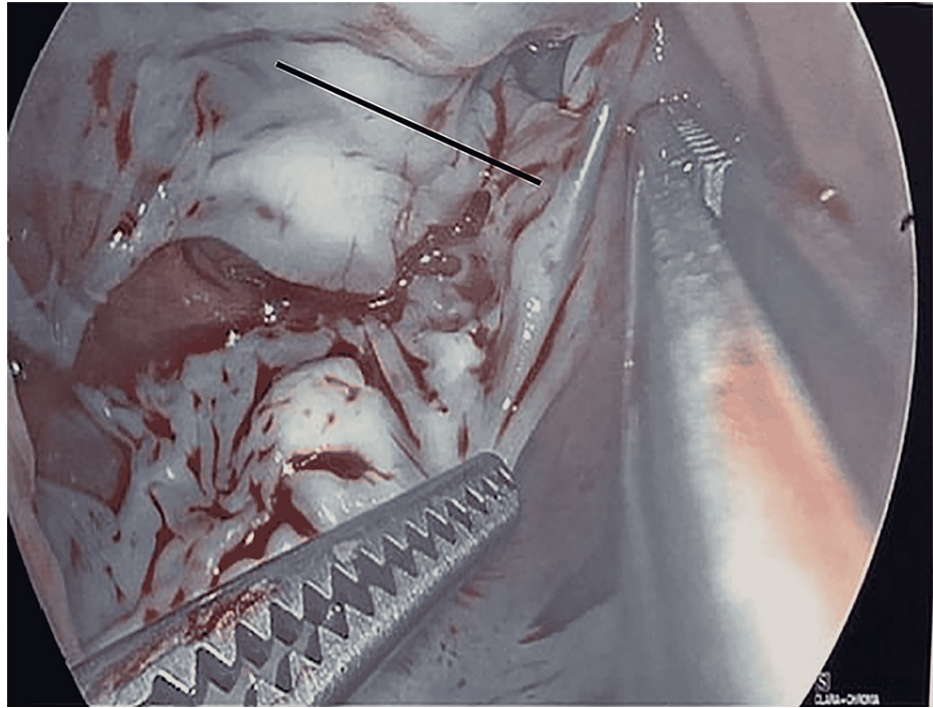


FIGURE 3: Dislodged needle below the septal leaflet of the tricuspid valve.

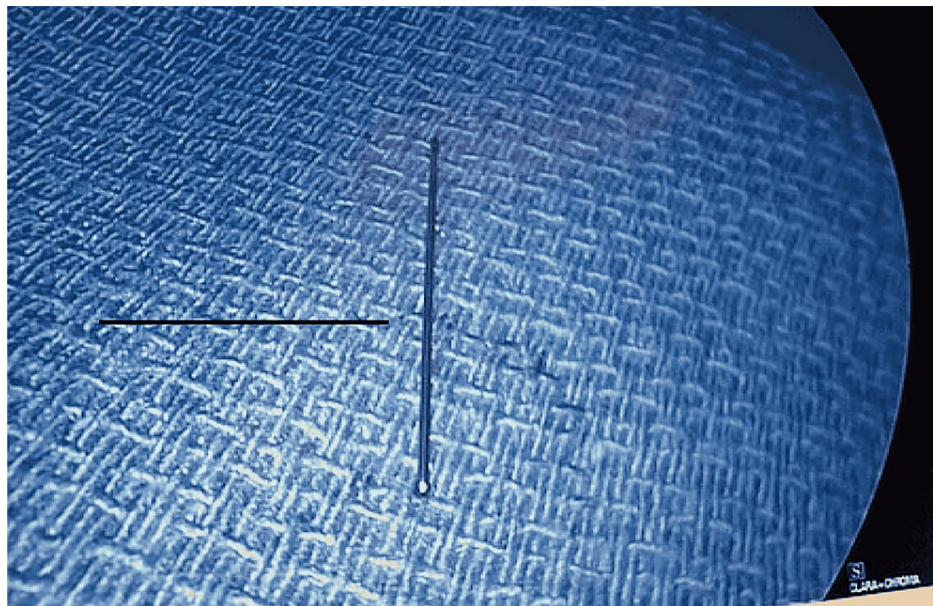


FIGURE 4: Needle removed from the heart.

Discussion

This case report reviews a patient who had a 3-cm needle dislodged into his venous system and implanted into his right atrium. A migrating foreign body in the heart is a unique presentation to the emergency room. Although there have been reports of patients having objects in their hearts, this case has several unique aspects. First, this patient injected himself with the needle that migrated into his right atrium, in contrast to most presentations where patients are victims of trauma or iatrogenic events. Second, the patient was taken to the operating room twice with two different surgical services, vascular and cardiothoracic surgery, for attempted needle removal. Third, a needle being dislodged is not very common in contrast to the more common objects although it has been reported [2,3]. For example, inferior vena cava (IVC) filters or vascular stents are more commonly migrated in comparison to needles [4].

Traditionally, patients who have migration of their IVC filters are usually symptomatic (12 of 14 cases), and may occur a long time after the insertion of the filter - in one patient four years following the procedure [4]. It has contributed to the cause of cardiorespiratory arrest in three out of 14 patients [5] and was associated with arrhythmias and death in two out of 14 patients [6], and led to the majority of death (50%) in the reported 104 patients. Moreover, larger devices than catheters and migrated stents can cause symptoms during the first year after placement. The larger foreign object can cause cardiac injury including aorto-right atrial fistulas, pericardial effusions, and valvular injuries [7,8]. These findings of migrating objects contributing to injury of the heart should be a lesson to not only physicians who perform procedures but also medical doctors who do not perform procedures.

Conclusions

The case report highlights the dangers of dislodged and migrating objects in the body. A 3-cm needle ultimately led to two surgical procedures for extraction. In addition, the diagnostic studies identifying the foreign body were critical in assisting with surgical removal. A blind surgical exploration without the use of focused imaging would be very difficult. Finally, migrating foreign bodies although rare can lead to serious consequences. The prompt removal of these objects is warranted for the safety of the patients.

Additional Information

Disclosures

Human subjects: Consent was obtained or waived by all participants in this study. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

References

1. Leitman M, Vered Z: Foreign bodies in the heart. *Echocardiography*. 2015, 32:365-71. [10.1111/echo.12795](https://doi.org/10.1111/echo.12795)
2. Pólos M, Domokos D, Şulea CM, et al.: Needle in the heart: a rare case of cardiac tamponade caused by a migrated foreign body and mimicking ST segment elevation myocardial infarction. *BMC Cardiovasc Disord*. 2021, 21:145. [10.1186/s12872-021-01950-6](https://doi.org/10.1186/s12872-021-01950-6)
3. Affronti A, Di Bella I, Di Lazzaro D, Capozzi R, Scarnecchia E, Ragni T: Cardiac tamponade caused by a migrating sewing needle. *J Cardiovasc Med (Hagerstown)*. 2016, 17 Suppl 2:e136-7. [10.2459/JCM.000000000000143](https://doi.org/10.2459/JCM.000000000000143)
4. Kalavakunta JK, Thomas CS, Gupta V: A needle through the heart: rare complication of inferior vena caval filters. *J Invasive Cardiol*. 2009, 21:E221-5.
5. Emaminia A, Fedoruk LM, Hagspiel KD, Bozlar U, Kron IL: Inferior vena cava filter migration to the heart. *Ann Thorac Surg*. 2008, 86:1664-5. [10.1016/j.athoracsur.2008.04.063](https://doi.org/10.1016/j.athoracsur.2008.04.063)
6. Haddadian B, Shaikh F, Djelmami-Hani M, Shalev Y: Sudden cardiac death caused by migration of a TrapEase inferior vena cava filter: case report and review of the literature. *Clin Cardiol*. 2008, 31:84-7. [10.1002/clc.20156](https://doi.org/10.1002/clc.20156)
7. Bani-Hani S, Showkat A, Wall BM, Das P, Huang L, Al-Absi AI: Endovascular stent migration to the right ventricle causing myocardial injury. *Semin Dial*. 2012, 25:562-4. [10.1111/j.1525-139X.2011.01039.x](https://doi.org/10.1111/j.1525-139X.2011.01039.x)
8. Cohen MH, Kyriazis DK: Wallstent migration into the right ventricle causing severe tricuspid regurgitation and right ventricular perforation. *Tex Heart Inst J*. 2012, 39:271-2.